



EXPERIENCE *INTUITION*



GROWTH TAKES INTUITION

INVITATION TO EXPERIENCE INTUITION

The Intuition ground system is redefining satellite communications with industry-leading innovations. Featuring cloud-native architectures for scalability, resiliency, and high availability, multi-orbit solutions for reliability and efficiency, and standardization for interoperability and seamless roaming, Intuition delivers seamless connectivity like never before.

ST Engineering iDirect is further paving the way for autonomous networks and smarter operations by enhancing Intuition with advanced analytics, AI, and automation. When combined with a zero-trust security architecture and cutting-edge digital twin technology, Intuition will set new standards for secure deployments and service availability.

This ebook explores how our innovative technology and new service options, coupled with our latest proof of concepts, are ushering our customers towards new applications, markets and growth. Please enjoy!

Sridhar Kuppanna
CTO AND SVP ENGINEERING, ST ENGINEERING IDIRECT



INTUITION



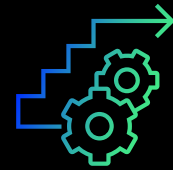
AT EVERY STEP

An advanced, secure satellite networking ground system based on a cloud-native, multi-orbit architecture that capitalizes on automation and the latest standards-based technologies, and unifies iDirect's industry-best capabilities.

Intuition core capabilities

Intuition core capabilities

Unifying iDirect's industry-best technologies with the latest innovations



INDUSTRY-BEST TECHNOLOGIES

Bringing forward the best-in-class iDirect features, trusted by global satellite players



CLOUD-NATIVE ARCHITECTURE

Scale services quickly and securely for the fastest return on investment



INTELLIGENT MULTI-ORBIT SUPPORT

Deliver tailored services for every application



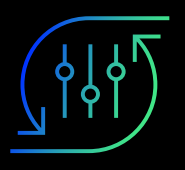
STANDARDS-BASED NETWORK CONVERGENCE

Efficiently integrate your satellite network into the global communications domain



AUTOMATION AND END-TO-END ORCHESTRATION

Leverage dynamic orchestration and automation for network operations

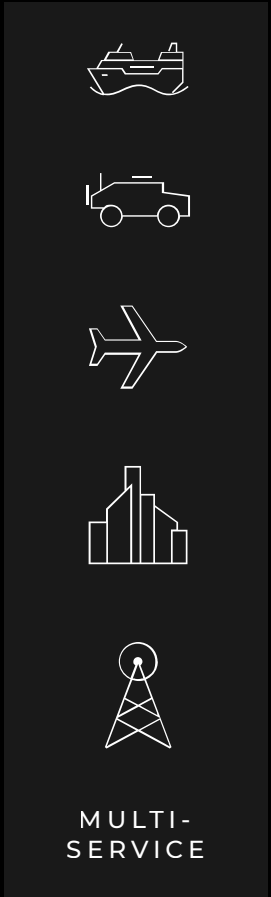
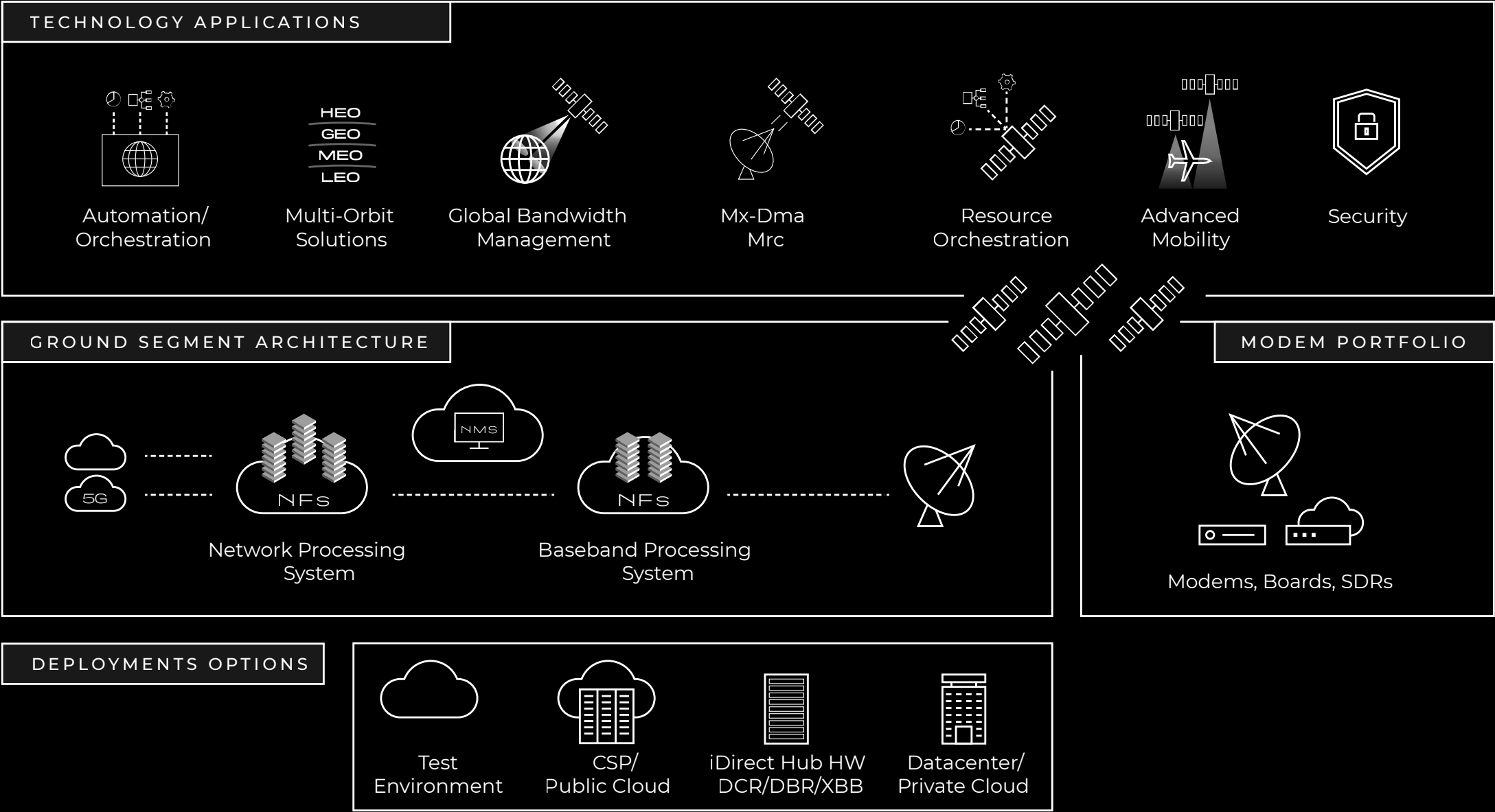


FLEXIBLE GO-TO-MARKET MODELS

Expand your customer base with the broadest range of business models

Intuition ground system

Intuition
ground
system



MULTI-SERVICE

Technology applications

Cloud-native NMS

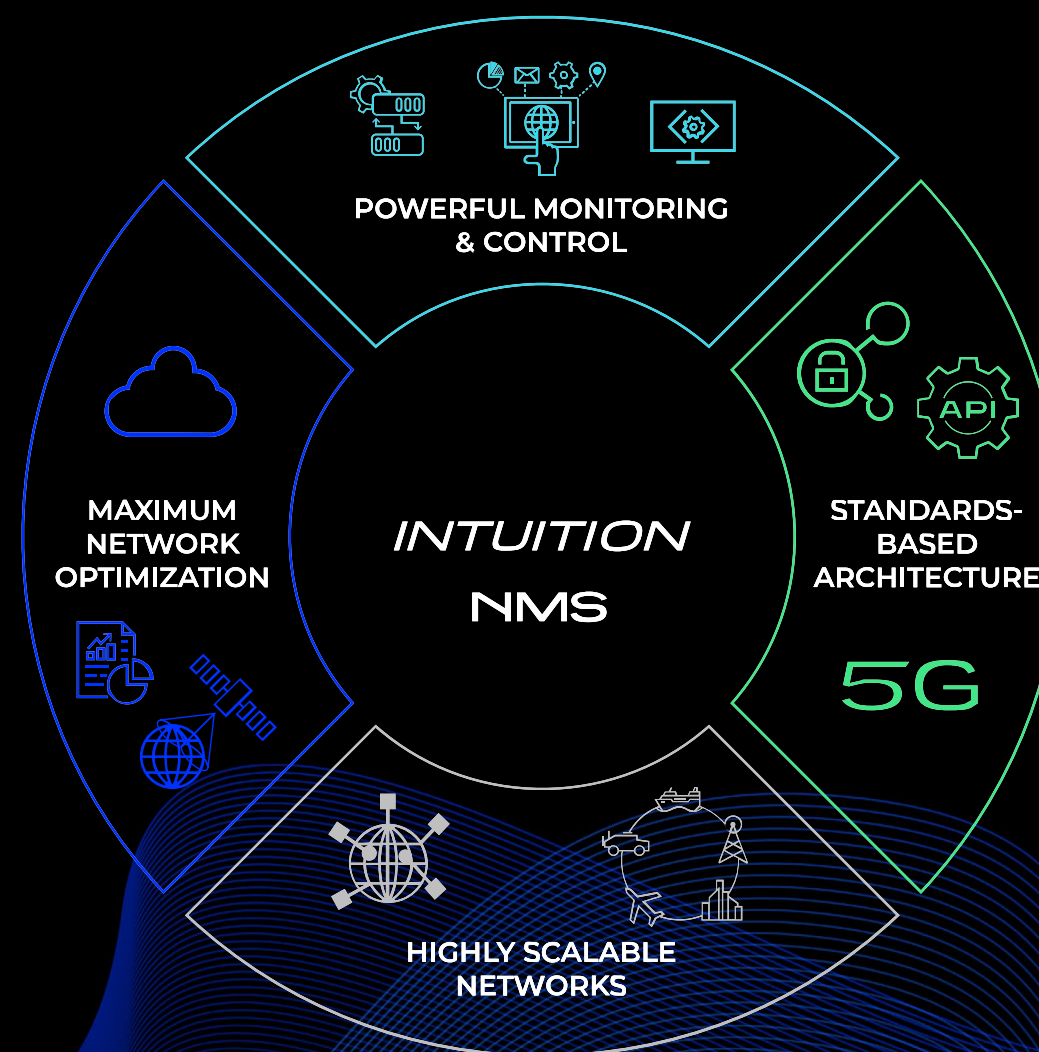
Comprehensive suite of network tools and standards-based APIs to deliver flexible configurations, cost efficiency, and a superior user experience

POWERFUL MONITORING & CONTROL

Advanced monitoring and customizable analytical tools for swift issue detection and resolution, improving network uptime, reliability, and efficiency

MAXIMUM NETWORK OPTIMIZATION

Designed to dynamically manage resources, boost network efficiency, and continuously enhance performance



STANDARDS-BASED ARCHITECTURE

Built on industry standards to ensure seamless integration, with rich APIs for service delivery, strong security, and flexible deployment

HIGHLY SCALABLE NETWORKS

Supports hundreds of thousands of terminals and features an elastic design that seamlessly scales up or down to meet changing demands

Intuition NMS

Streamline network management and unlock the full potential of satellite communications



KEY DIFFERENTIATORS

- Built on a cloud-native, microservices-based architecture
- Achieves very high network scale
- Offers flexible deployment options

Intuition security

Secure-by-design
approach embedding
security throughout
from coding to
deployment

KEY BENEFITS

- Ensures a reliable and resilient ground system
- Provides secure operations
- Results in continuous improvement and protection
- Instills customer confidence

FEATURES

SECURE DEVELOPMENT LIFE CYCLE

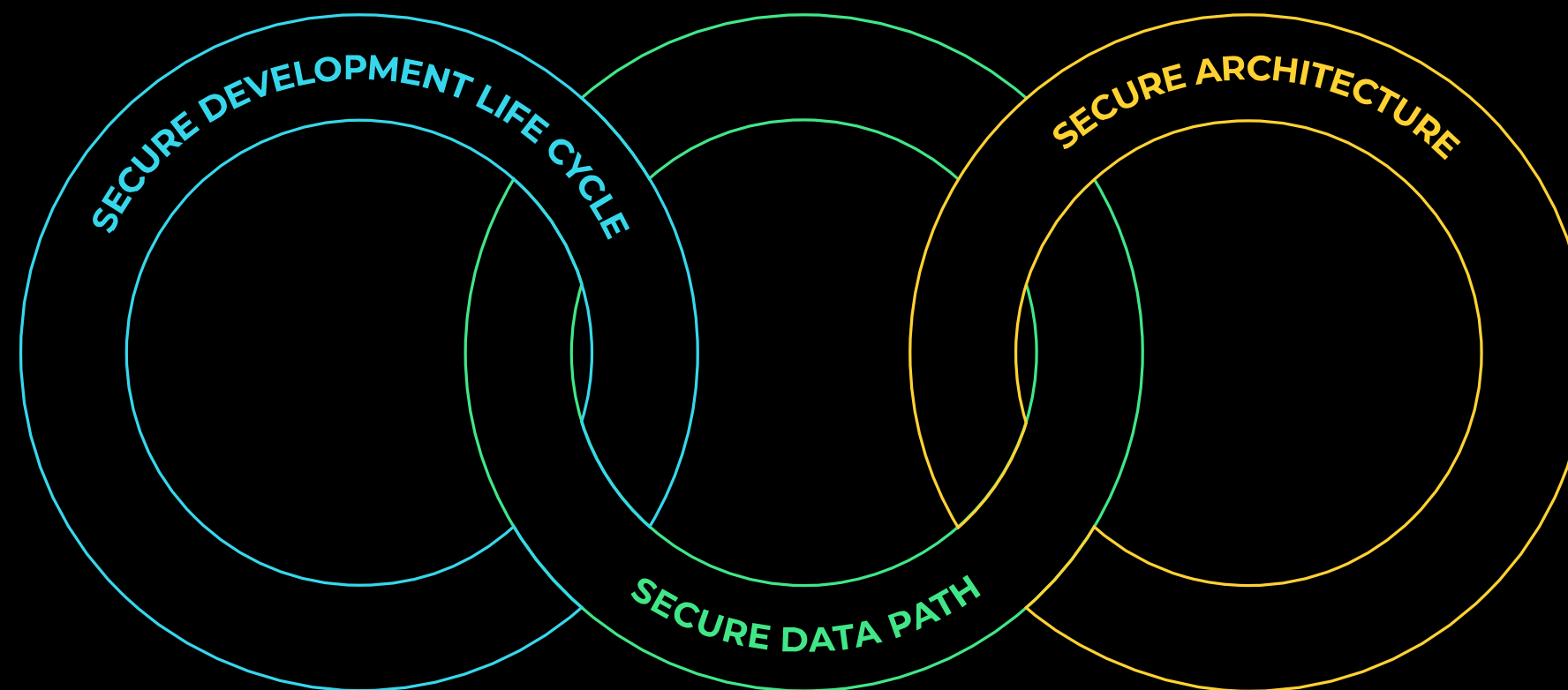
- Industry standards & regulations
- Comprehensive DevSecOps

SECURE DATA PATH

- AES encryption
- Dynamic key exchange

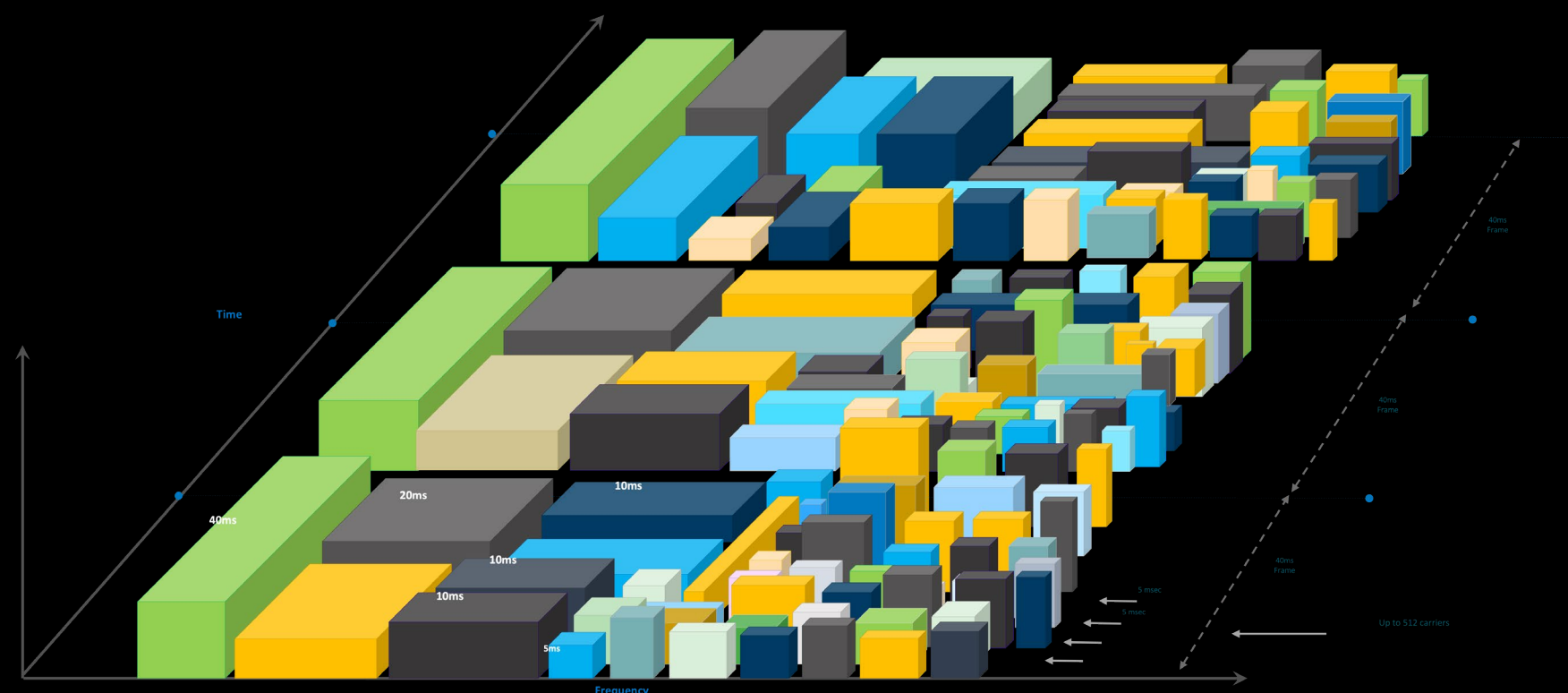
SECURE ARCHITECTURE

- OWASP and NIST frameworks
- AAA, RBAC, SSO, and MFA



Waveforms

Mx-DMA MRC is the most advanced, self-organizing return waveform for every application in shared capacity



SCPC-LIKE EFFICIENCY

Intelligent, real-time bandwidth allocation up to 100 Msps

SERVICE AGILITY

Multi-service platform manages complex traffic demands and Quality of Experience

APPLICATION AND NETWORK SCALABILITY

A single network to support thousands of terminals for the widest mix of requirements

PERFORMANCE

300 Mbps of throughput on the return channel

Advanced mobility networks



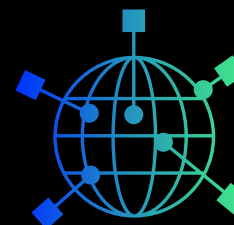
NGSO OPERATIONS

Tracking and networking to support new multi-orbit operations



ADVANCED BEAM SWITCHING

Optimized beam selection for the most seamless connectivity



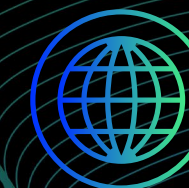
BANDWIDTH & QOS OPTIMIZATION

Network-wide allocation, universal configuration, and continuous optimization



SATELLITE NETWORK RESOURCE ORCHESTRATION

Enabled through partnerships and technology for dynamic control



MAP INNOVATIONS

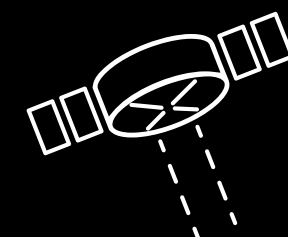
Optimal for software-defined satellites and NGSOs

Advanced mobility use cases

HEO
GEO
MEO
LEO

MULTI-ORBIT NETWORKS

Global and regional satellite network operators need to hybridize their capacity to differentiate their offerings



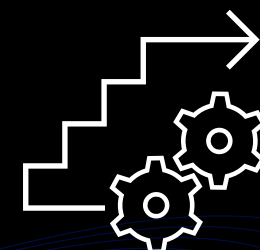
LEGACY & NEXT-GEN SATELLITES

As new satellites add complexity, network operators need to switch between these and older assets



COMMERCIAL & GOVERNMENT SYSTEMS

Set and manage domains to adhere to regulations or policies not required for commercial network traffic



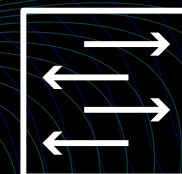
CONSOLIDATION SCENARIOS SYSTEMS

Operators in the process of consolidation need to enable switching between disparate networks



NATIONAL, REGIONAL DOMAINS

Define country, regional or global satellite network domains



MIGRATION TO INTUITION

While deploying Intuition, switch between networks and pool bandwidth on current and new platforms

Intuition QoS management

Award-winning capabilities for traffic optimization and SLA adherence

INTUITION

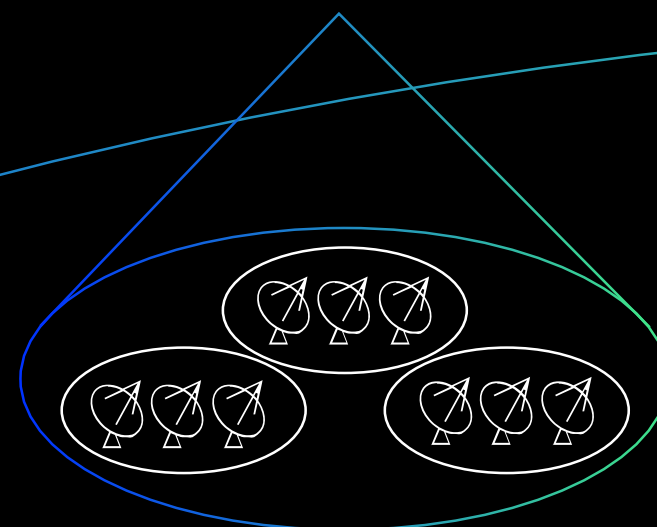
QOS

Support configuration of many terminals to one beam



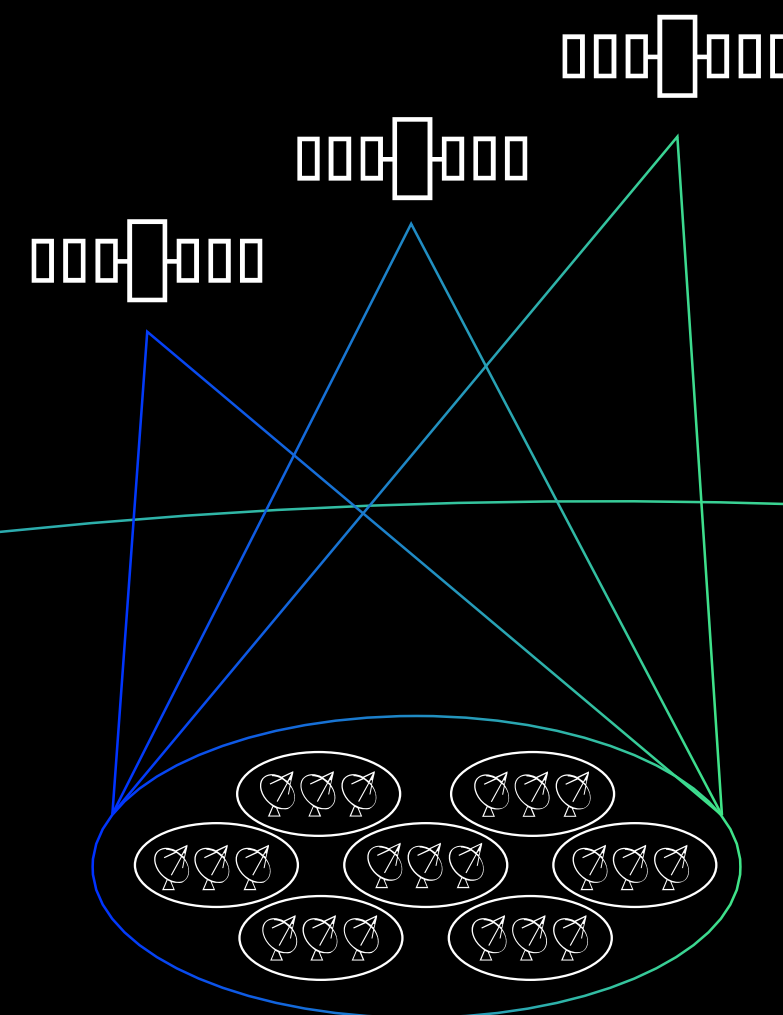
GROUP QOS

Support configuration of groups of many terminals to one beam



QOS IN GBWM

Support configuration of many groups of terminals across unlimited numbers of beams, satellites



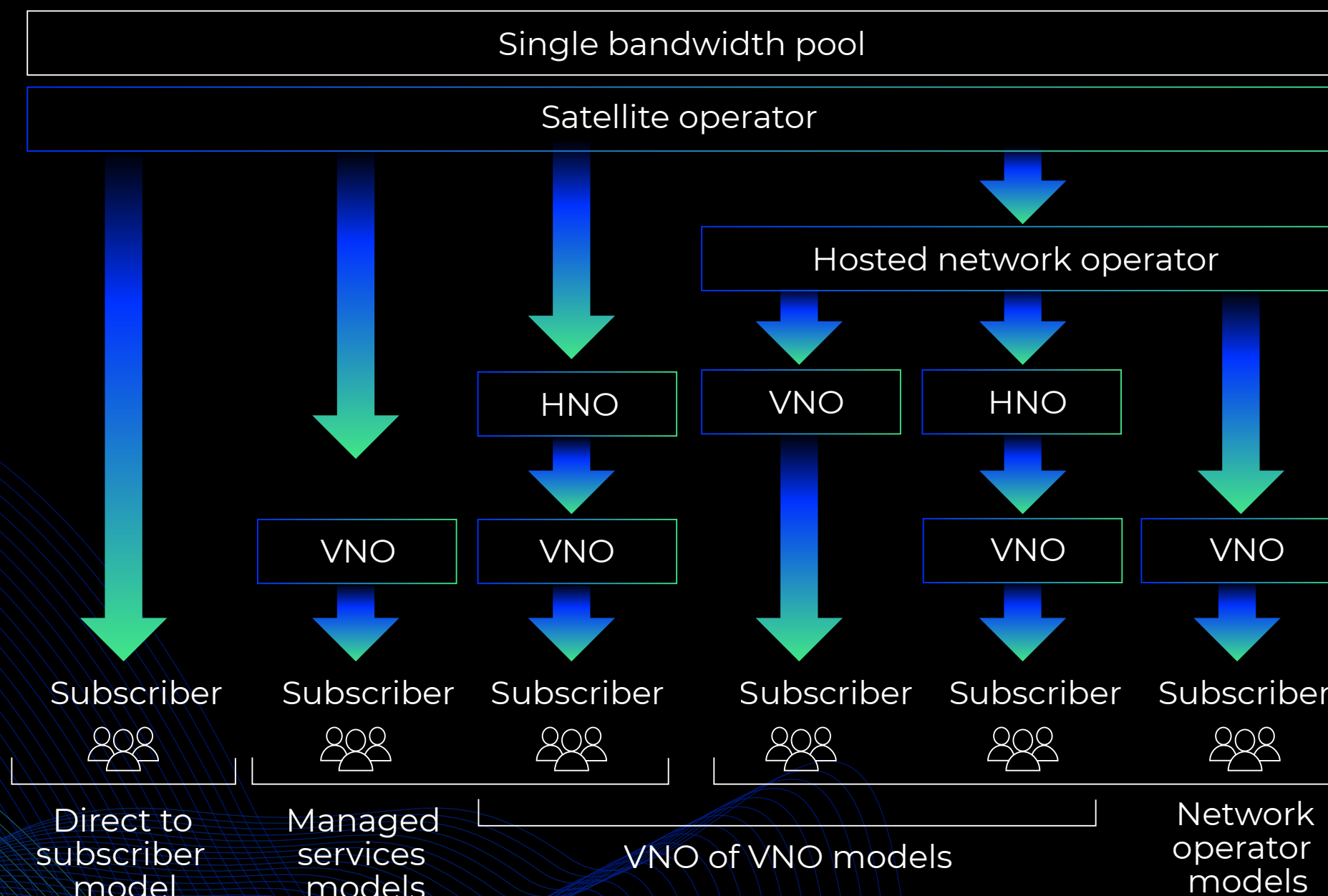
Global bandwidth management

Ideal for mobility, multi-orbit and dynamically changing environments

GO-TO MARKET	UNIVERSAL DESIGN	SYSTEM-WIDE ALLOCATION	CONTINUOUS OPTIMIZATION	SERVICE MANAGEMENT AND CONTROL
<p>Model Choice</p> <p>Multi-tenant, multi-level to support flexible requirements for all use cases</p> <p>From best-effort to CIR-based SLAs</p>	<p>Combine multiple satellite resources into a single or multiple regional or global pools</p> <p>No need for per-carrier QoS setup or continual adjustment</p>	<p>Account for all available carriers at any instance</p> <p>Manage MIR/CIR commitments across the system</p> <p>Automatic allocation based on fluctuating demand</p>	<p>Without complex external intervention</p> <p>Accommodate more terminals in the network</p> <p>Maximize SLA fulfillment</p> <p>More efficient use of resources</p>	<p>Eliminate beam-based QoS silos</p> <p>Global QoS enforcement</p> <p>Service area shaping</p> <p>Granular control with Intuition NMS</p>

Global bandwidth management

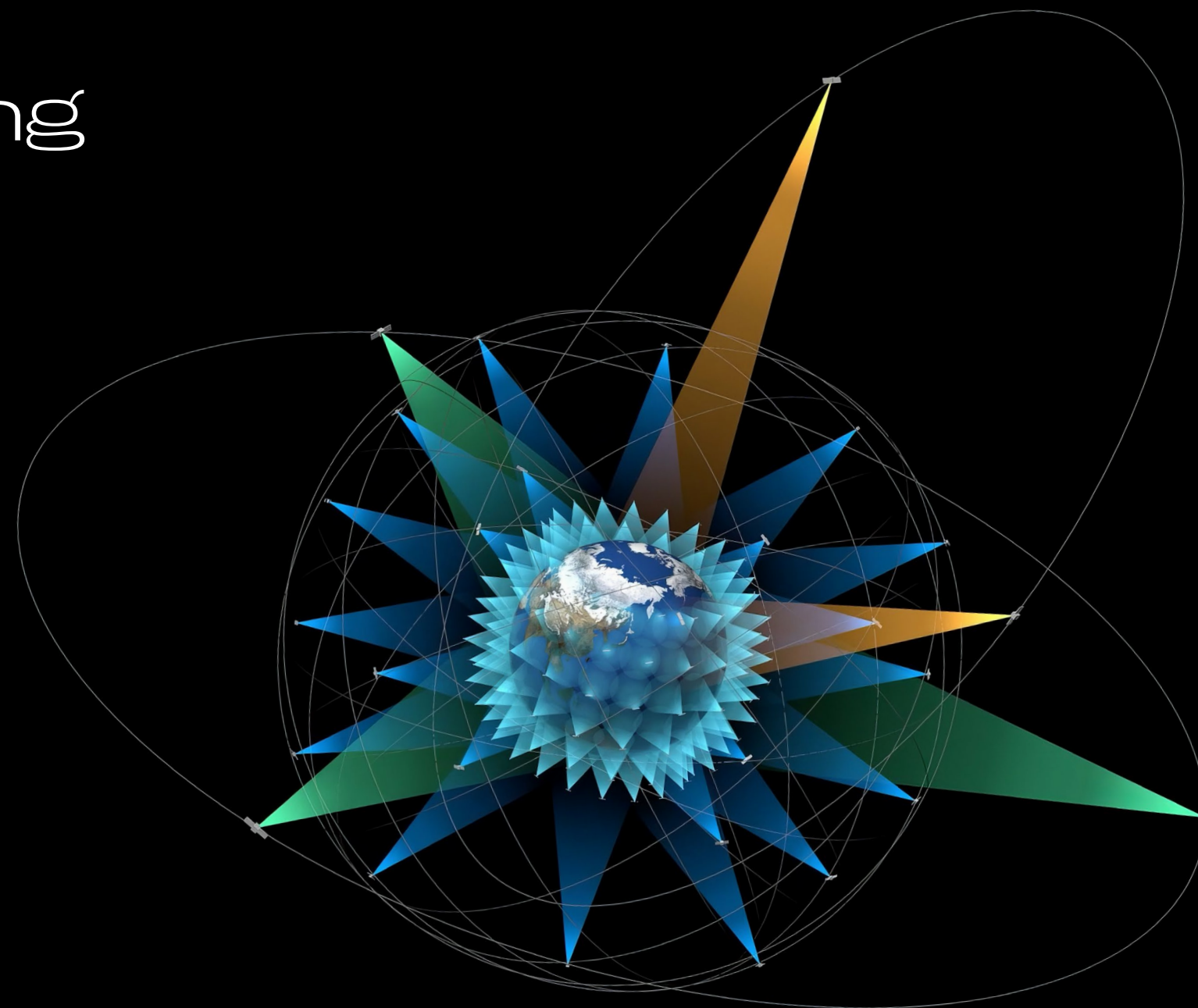
Trusted today by the world's leading satellite operators



Multi-orbit tracking

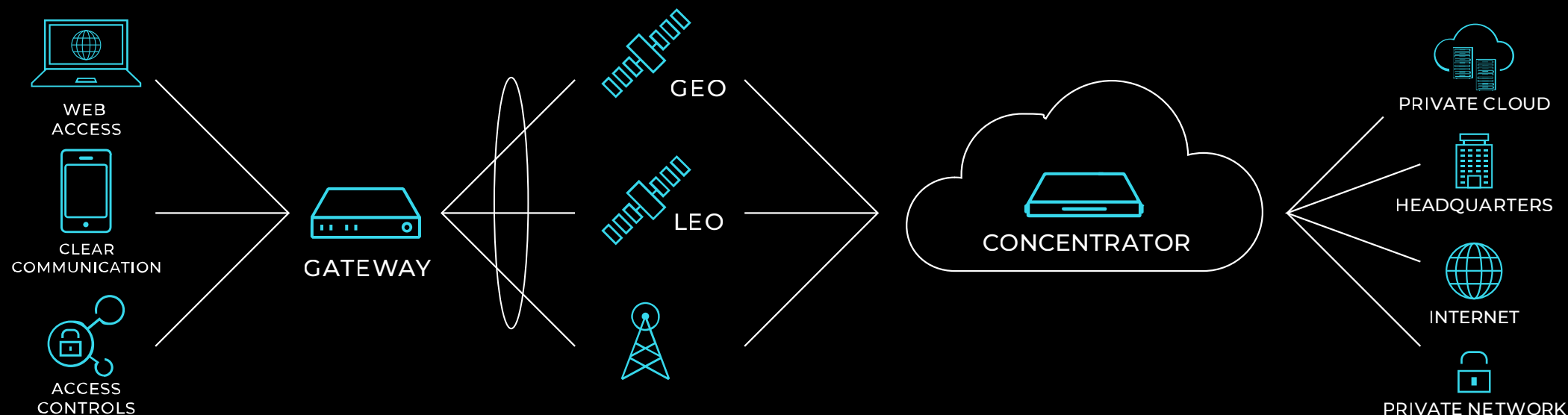
NGSO TRACKING NOW LIVE ON ORBIT

- Industry's first multi-orbit switching by a single modem and antenna
- Fast tracking convergence for higher performance switching across orbits
- Real-time location, velocity to keep hubs and terminals in sync
- No manual correction as remote terminals track and acquire to satellites automatically
- NMS keeps hubs and terminals in sync with dynamic satellite/map data
- Streamlined solution for all: LEO, MEO, HEO and GEO



Multi-network traffic management

Aggregation, optimization, diversity and self-healing for multi-orbit networks



DRASTICALLY INCREASE BANDWIDTH

Combine GEO with lower cost NGSOs or wireless

High performance capacity increase at remote locations

SERVICE DIVERSITY AND IMPROVED AVAILABILITY

Automatic traffic switching when one link is impaired

Failover measures for mobile applications

AVOID JAMMING AND INTERFERENCE

For traffic steering, stream duplication and intelligent bandwidth

IMPLEMENT LINK REDUNDANCY

Automatic failover to selected or available link

OFFLOAD SATURATED LINKS

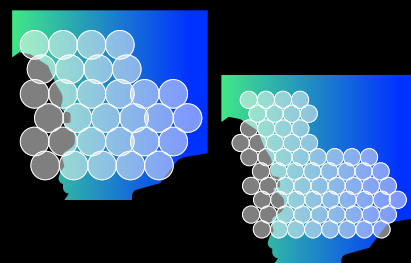
Improve compliance on SLAs and end user satisfaction

INTUITION

Resource orchestration

Dynamically reconfigure beam maps and bandwidth

STATIC USE CASES



BEAM MAPS, BANDWIDTH RECONFIGURATION

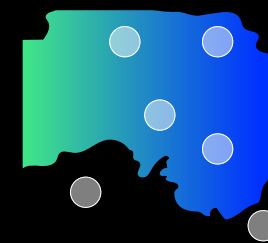
- Maximize sellable capacity to fulfill services demand
- Reconfiguration of geographical or localized areas
- Develop spot beam patterns, frequency, band and carrier plans



KA/Q/V GW DIVERSITY AND BACK-UP

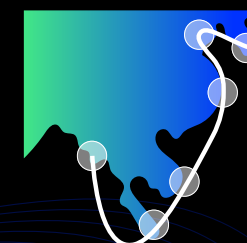
- Rain fade diversity schemes
- 1+1 GW switchover and smart diversity
- Backup GW switching

DYNAMIC USE CASES



ON-DEMAND ORCHESTRATED BEAM / SERVICES ACTIVATION

- Resource activation at the target location
- Expand serviceable footprint without dedicated beam grid coverage
- Provide ad hoc tailored service



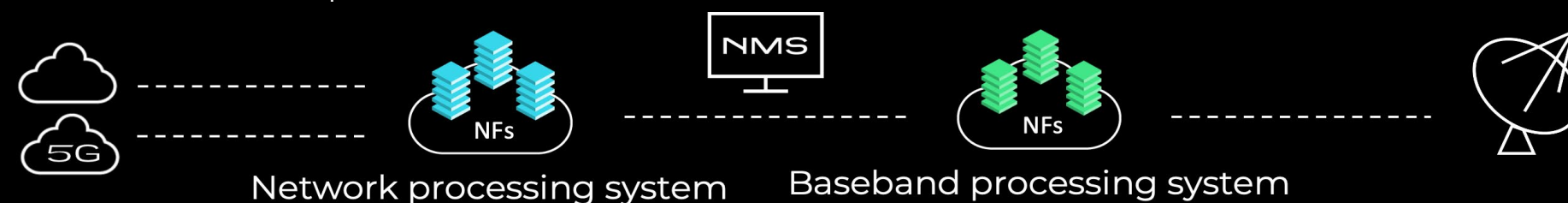
ADVANCED MOBILITY DYNAMIC RESOURCE ALLOCATION

- Spot beam utilized to follow mobility platforms
- Update resource allocation in the beam grid
- Fulfill traffic demand

Architecture

Network processing and baseband systems

Scalable cloud-native software solution that is flexible to support diverse operational and deployment requirements while ensuring robust and efficient performance.



Deployment options



Networking: Layer 2/3 processing, acceleration, QoS, mobility control

Baseband: Modulation and demodulation in the most efficient waveforms DVB-S2X and Mx-DMA MRC

CIDI framework: Kubernetes-driven virtualization orchestration of network functions

Deployment: On-premises with iDirect DIFI-enabled hardware DIFI, on COTS in private datacenter clouds, or in the public cloud

Intuition modem portfolio

The right modem for every market and application

A wide range of modem capabilities and form factors efficiently operating in single bandwidth-sharing networks

High availability and mobility focus, featuring dual radio interfaces for seamless handover

Next-gen software-defined, multi-waveform modems and edge-cloud deployment options



INT2000



MDM2010



IQ SERIES



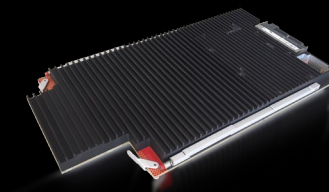
MDM2510



MDM3315



MDM5010



IQ 800



450 SDR

Intuition go-to-market options

GROWTH TAKES INTUITION

YOUR GO-TO-MARKET STRATEGY

Technology innovation is important to position satellite communications within the greater telecommunications ecosystem. Today, however, there is another burgeoning requirement being vocalized by satellite operators and service providers; our customers are seeking expanded go-to-market flexibility to face new and continuing commercial challenges.

From restrictive hardware and complex deployments to less risk and an accelerated path to revenue, our customers want to reduce operational learning curves and implement new technologies faster.

ST Engineering iDirect introduced Intuition Unbound to alleviate these challenges, creating opportunities for increased market access and allowing operators to confidently pursue new business goals.

Cynthia Harty

SVP, CORPORATE DEVELOPMENT, ST ENGINEERING IDIRECT





INTUITION *unbound*



*Transform the way you
manage your ground network*

unbound OPERATIONS

*Build on the latest technologies and
capabilities—without the complexity*

unbound CAPABILITIES

Intuition Unbound redefines how satellite operators and service providers approach ground segment technology, unlocking them from traditional infrastructure business models and driving the shift to consumption-focused solutions tailored to the operational demands of a fast-changing market.

YOUR GROWTH, DELIVERED AS A SERVICE

Unbound Operations

Transform the way you manage your ground network

SERVICE FEATURES				
24/7 OPERATIONAL MANAGEMENT Complete oversight and optimization of ST Engineering iDirect platforms and solutions	CONFIGURATION MANAGEMENT Establish and control network configurations and alarms to maintain service availability	EVENT MANAGEMENT Monitor, manage, and respond to network alarms to ensure reliability	REPORTING & ANALYTICS Access detailed, data-driven insights through a customer portal offering visibility into performance metrics	CUSTOMER EXPERIENCE MANAGER A dedicated point of contact for end-to-end service delivery and engagement



Consumption-based model designed to ensure frictionless operations

- ✓ Free your team from the complexity of network management while aligning operational costs with revenue
- ✓ Minimize operational burden so your team is free to focus on customer service and business growth



Adaptable solution for streamlined network management and enhanced business focus

- ✓ Proactive monitoring of network attributes for early detection of performance deviation reduces configuration management time
- ✓ Flexible service plans tailored to network size and complexity to ensure seamless scalability and optimized performance



Trusted ground system specialists for network optimization and service assurance

- ✓ Leverage iDirect's experience across thousands of networks to ensure optimal performance
- ✓ Eliminate long-term investments in retraining, skills gaps, and attrition

Unbound Capabilities

Build on the latest technologies and capabilities – without the complexity

SERVICE FEATURES

INFRASTRUCTURE OWNERSHIP

iDirect owns the ground system equipment, which means we take responsibility for all aspects of hardware and software maintenance

IMPLEMENTATION, INSTALLATION & DEPLOYMENT

Our expertise in setting up and configuring the network infrastructure ensures your specific operational needs are met

LIFECYCLE MANAGEMENT

As the architects of the ground system, we are aware of each component's lifecycle, allowing us to optimize service availability

NETWORK AUTONOMY

Flexibility to establish service plans, service levels, QoS, and more while utilizing all the best technology applications



Predictable consumption-based model enables frictionless transitions to new services

- ✓ Easily expand capabilities via a modular service model that enables frictionless upgrades
- ✓ Predictable costs aligned with expansion of existing services or introduction of new services



Scalable architecture adapts to your evolving network needs

- ✓ Flexible, consumption based subscription model allows you to scale your network as needed, only paying for what you use
- ✓ Modular service plans enable activation of only relevant capabilities, empowering you to explore new market opportunities



Expand services with confidence, free from the risks of up-front investment

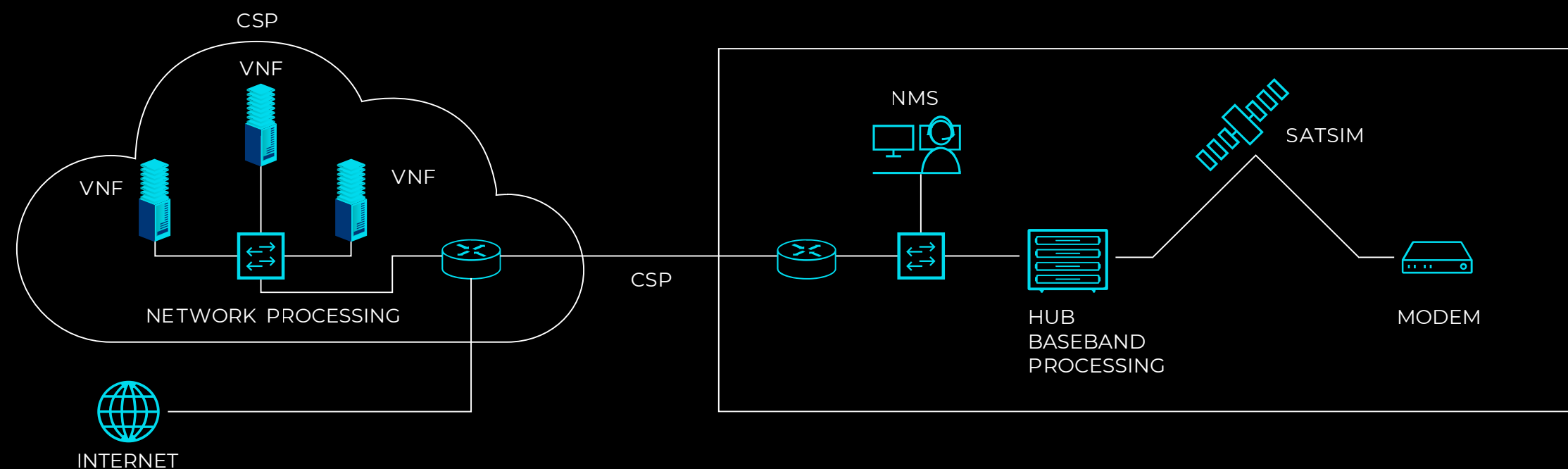
- ✓ Access the latest innovations on the Intuition ground system without the complexities of technology refresh planning
- ✓ Leverage reduced implementation times to speed time to revenue

Demos and proof of concepts

Cloud and virtualization advances

BENEFITS

- Allows for hybrid deployment models to scale up and down more cost-effectively
- Optimized deployment with footprint matching customer use cases
- Faster, more optimized operations
- Leverage CSP's latest security features
- Increase revenue opportunity with CSP applications



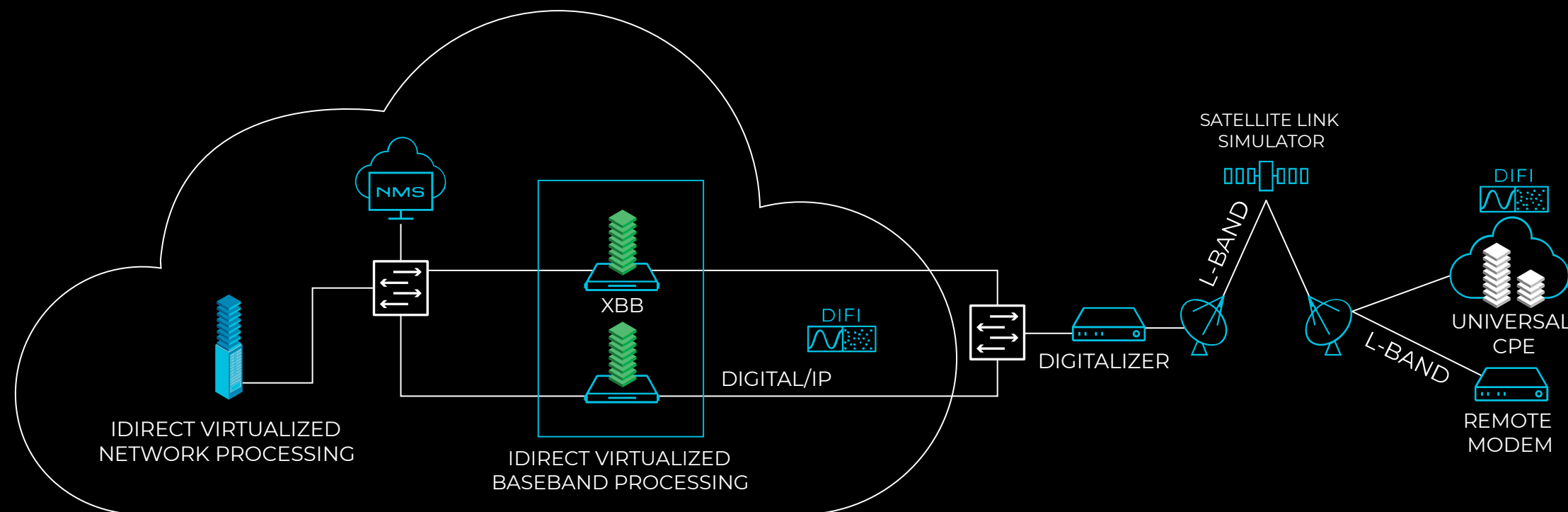
NETWORK PROCESSING IN CLOUD

PoC with CSPs -Virtualized network processing functions on public cloud infrastructure decoupled from baseband processing

Cloud and virtualization advances

BENEFITS

- Allows for hybrid deployment models to scale up and down more cost-effectively
- Optimized deployment with footprint matching customer use cases
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VIRTUALIZED BASEBAND PROCESSING

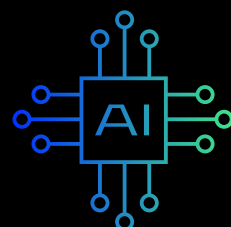
PoC / virtualized hub and modem baseband functions deployed on COTS infrastructure with DIFI interoperability

Experience AI, automation, & analytics

BENEFITS

- Improve satellite network monitoring and troubleshooting
- Streamline processes and reduce operational costs
- Accelerate time-to-market and revenue realization
- Minimize network outages by empowering proactive actions after early detection of potential network issues
- Less manual network health monitoring and analysis

INTUITION



AI-DRIVEN CHATBOT

Virtual assistant that answers iDirect platform specific questions without relying on documentation searches or customer support

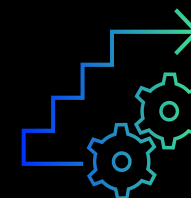
Transform satcom capabilities to be more data-driven and software-centric



AI-ASSISTED TROUBLESHOOTING

Tool that detects anomalies caused by rain fade with greater speed and precision

Analyze large datasets to dynamically adapt and autonomously make decisions



ZERO-TOUCH MODCOD CONFIGURATION

Continuously optimize channel performance by leveraging machine learning (ML) algorithms to overcome link degradation

Empower operators to better understand user behavior and anticipate their needs



AI/ML-DRIVEN NOISE DETECTION

Identify and classify phase noise and RF impairment by analyzing patterns and anomalies for seamless network operation

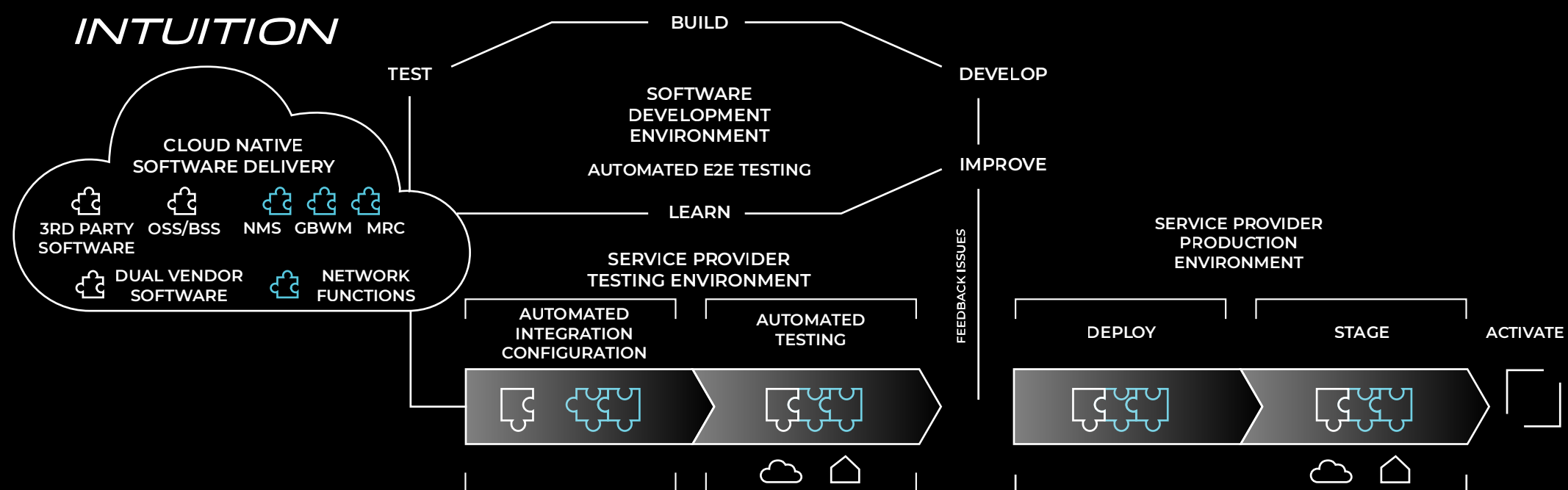
Test automation and digital twin

Scalable Intuition development and test environments deployed in public cloud

KEY BENEFITS

- Enables more frequent testing earlier in the development cycle (i.e, nightly builds)
- Increases delivery speed for software updates and debugging
- Enables more iterative, smaller, faster releases
- Cloud-staging allows faster evals and upgrades

INTUITION



DIGITAL TWIN

- Replica of test environments facilitate automated testing frameworks and scenario-based testing
- Lifecycle management and orchestration tools for operational efficiency
- Agile methodologies based on CI/CD best practices to accelerate new features

Your journey to Intuition

Steps to network convergence

Leveraging standards to enable integration into global telco



5G

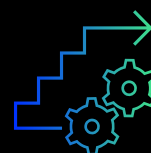
NETWORK-OF-NETWORKS
CONVERGENCE WITH 5G NTN

HEO
GEO
MEO
LEO

EVOLUTION TO NEXT-GENERATION
SATELLITE NETWORKS



VIRTUALIZATION OF THE GROUND
SEGMENT IN HYBRID DEPLOYMENTS



BUILD ON TRUSTED INDUSTRY-BEST TECHNOLOGIES
AND A FOUNDATION OF COLLABORATION

GROWTH TAKES INTUITION

PAVING THE WAY TO SUCCESS

The satellite communications industry is at a critical turning point, and the message is clear: businesses that embrace change and act decisively will be better positioned to meet customer demands, capitalize on new opportunities, and stay ahead of the competition.

The market is moving fast, and there's no time to hesitate. As an industry, we must come together to innovate, collaborate, and succeed. By breaking down barriers and amplifying customer value, we can usher in a new era of satellite communications.

At iDirect, we're ready to lead this transformation with you, our partners. Together, we can accomplish far more than we ever could alone.

Here's to the exciting opportunities ahead.

Sincerely,

Don Claussen
CEO, ST ENGINEERING IDIRECT



The next step in your Intuition journey

Ready to unlock the future of satellite networking?

Connect with a dedicated sales representative and discover how
Intuition can transform your vision into reality.

INTUITION

AT EVERY STEP

 **ST Engineering**

 **iDIRECT**

