



# Cisco Next-Generation Global Services (NGGS)

Global Access to Anytime, Anyplace, On-Demand Broadband Services

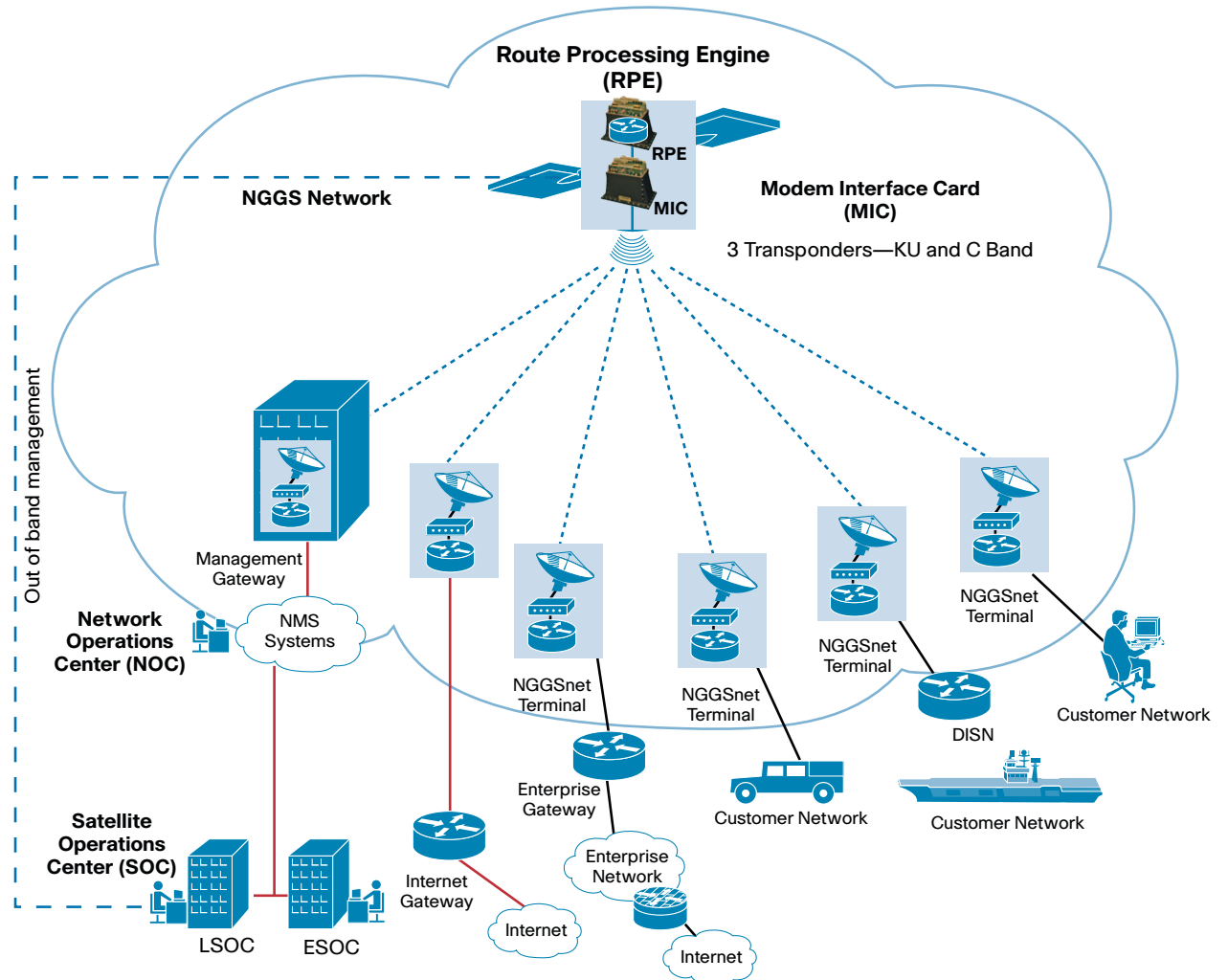
## The Value of Next-Generation Global Services

Cisco® Next-Generation Global Services (NGGS) delivers current and emerging terrestrial and space-based services using Cisco IP networking solutions. Leveraging the capabilities of the Cisco Space Router, NGGS enhances both the efficiency and reliability of defense and commercial satellite communications.

Extending the IP network into space allows for the creation of seamless, global satellite networks to support continuity of operations and emergency communications. The converged data, voice, and video capabilities of the Cisco NGGS network support traditional information transfer and collaboration applications plus advanced services such as Cisco TelePresence™ conferencing. Increased throughput for small ground antennas enables even highly mobile field units to access vital broadband services. And as a managed service, Cisco NGGS allows customers to focus on their missions, not on engineering and operating satellite networks.

The Cisco Space Router is a radiation-tolerant router that implements network services directly onboard a satellite. This first Internet Router in Space (IRIS) is a hosted payload on Intelsat 14 (IS-14). IRIS was created by Cisco at the request of the U.S. Department of Defense, and will document the benefits and risk reduction of routing and other network services directly onboard a satellite as part of a Joint Capabilities Technology Demonstration (JCTD).

Figure 1 illustrates the Cisco NGGS network architecture with a Cisco Space Router that links widely dispersed military and commercial sites through easily deployed satellite ground terminals. The Cisco NGGS network operations center (NOC) provides unified control of this managed service.





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## Overcoming Satellite Communication Challenges

The Cisco NGGS proof-of-concept network was designed to solve multiple crucial communication issues with today's transponded satellite networks.

Traditional satellite systems function as silos, due to geography, management jurisdiction, waveform and modem technology, transponder band (C, Ku), and coverage area. Interconnection—if it occurs at all—must be performed through a centralized hub.

By contrast, the Cisco NGGS network with its space-based IP router offers unprecedented communication efficiency and cost effectiveness.

- *Single-hop communications:* Satellite services that rely on ground-based hubs must either connect through a teleport or establish their own reach-back connectivity for each isolated network. This is an inefficient and costly approach that can introduce delays in excess of 500 milliseconds (ms) and requires double-bandwidth utilization. By using a space-based router, the Cisco NGGS network can route traffic between bands (Ku and C) and across transponders to interconnect small, geographically dispersed sites in a single hop.
- *Equipment and connectivity flexibility:* The simple installation of satellite ground terminals at remote sites instantly provides connectivity to a VPN and Internet or enterprise reach-back access through a Cisco NGGS gateway. This means that units can reach each other in a single hop simply by purchasing and installing terminals selected to meet each unit's specific requirements for equipment costs and service level. Because there is no need to double-hop through a teleport, even terminals with small antennas can support high-bandwidth applications such as video conferencing.
- *Efficient bandwidth usage:* Users of conventional satellite communications systems often pay for far more

bandwidth than they use on a routine basis, just to ensure that sufficient capacity is available when they need it. Cisco NGGS offers multiple service levels—with committed information rates up to 512 Kbps and burst rates as high as 5.2 Mbps—that feature bandwidth on demand. And billing is based on actual usage, not on static bandwidth subscriptions.

- *Reduced startup and management costs:* Cisco NGGS is a managed service, so it eliminates the need for defense organizations to purchase and manage satellite bandwidth and associated network systems themselves. Customers need only purchase their chosen ground terminals and a service-level subscription. This hands-off architecture enables defense personnel to focus on their mission, not on the transport network.

## Bringing the Power of the Internet to Space

Cisco NGGS extends the power of IP networking to space—smoothly and cost effectively—with full-mesh, single-hop communications. Reducing costs for both satellite users and service providers, NGGS is the perfect platform for on-demand broadband services such as video, Cisco TelePresence, and sensor data.

An important benefit is that the Cisco NGGS network will bring converged services to users who are currently disadvantaged due to dispersed geographic location, cost of current satellite voice or data services, or mobility. It will offer them collaborative tools such as VoIP, video, and chat in the cost-effective manner required to be mission-successful in today's connected world.

Powering the space-based IP networking of Cisco NGGS is the Cisco Space Router. It offers many of the advanced features found in Cisco's terrestrial routers, including:

- IPv4
- QoS
- Mobile IP
- BGP
- Multicast
- IPv6
- Access Control Lists (ACLs)

- Extensive Cisco IOS® Software security features
- IPsec VPN termination with hardware-assist encryption engine

## Flexible, Resilient Broadband Services

The integrated design of Cisco NGGS simplifies staffing and training in the challenging arenas of military preparedness and emergency communications. Cisco NGGS easily connects remote terminals in a full-mesh environment, with reach-back access to the Internet or to enterprise networks. Additional terminals can be deployed quickly and easily in situations of equipment failure, cyber attack, or continuity of operations. There is no need to re-engineer the solution each time disaster strikes or a unit deploys to a different operational area.

Using a web-based customer service portal, terminal usage and service can be monitored and re-provisioned for mission-critical requirements, TelePresence on demand, or increased service levels.

Support for emergency communications and continuity of operations will become even more robust as additional satellites containing space routers are launched, increasing the ability to reroute traffic around failures in the terrestrial infrastructure.

## Why Cisco?

Cisco supports governments and defense agencies around the world by delivering innovative, integrated mission capabilities through thought leadership, advanced technologies, and services. Our staff comprises top experts from space, military, homeland security, public safety, and the intelligence community, from all levels of government worldwide. Our experts not only understand the unique challenges of government, but also bring years of personal experience to help meet mission requirements.

To learn more about the NGGS network and the IRIS test bed, please visit [www.cisco.com/go/iris](http://www.cisco.com/go/iris).