



Solutions brief

CYBERSECURITY

CYBERSECURITY: IT'S IN OUR DNA

You should take cybersecurity seriously, because inflight threats are real.

That's why at Gogo, we realize the ever-pressing need to be vigilant in staying ahead of potential security threats. Security isn't something we have added after the fact. Since our start, we've built security into the design and delivery of our networks and systems. You could say, security is in our DNA. We've secured and protected more than tens of millions of flights over the lifetime of our network.

Gogo is the only inflight connectivity provider that owns, protects, and optimizes its whole network infrastructure, and is the only provider that manufactures the equipment for its onboard systems. Because we operate and manage our systems end to end, we can monitor and analyze the security of our network and onboard systems. And, through our own standards or in partnership with the FAA and other aviation stakeholders, we've been a leader in defining and implementing best practices for airborne cybersecurity. We're solving cybersecurity problems before they happen, so you can connect confidently when you fly.

OUR SECURE AIR-TO-GROUND (ATG) NETWORK

We leverage the most advanced network designs to provide comprehensive security for our air-to-ground (ATG) network covering the continental U.S., and parts of Canada and Alaska. And, we stay current with the latest innovations in secure network design. Our Network Operations Center (NOC) provides continuous monitoring and troubleshooting of our broadband network. This allows us to quickly identify, detect, respond, and recover from potential cyber threats.

The following information details how we provide secure airborne connections 24/7/365 through our ATG network connections, onboard aircraft equipment configurations, and the Gogo NOC.

Gogo Biz ATG network communications: Gogo secures all communications that occur on its ATG network. This includes any data transferred between the aircraft, network ground stations and Gogo's two data centers.

All data transmitted over the airborne network is secured through licensed spectrum with proprietary link layer encapsulation for secure air-to-ground communications. Gogo uses Code Division Multiple Access (CDMA) technology on our ATG wireless network. CDMA is the technological backbone used by two of the largest wireless network providers in the U.S., and others around the world.



Gogo Biz®
Network



Gogo Data Center
Includes multiple data centers for
redundancy and failover.



Gogo Network
Operations Center
(NOC)



Your
work
life

Your
personal
life



Securely send emails,
presentations, spreadsheets,
and conduct video conferences.
Supports access to VPN.



Securely shop, bank, share, and
send messages online.

REAL SECURITY BUILT IN, END TO END.



Air-to-Ground (ATG) network
secured through Gogo cybersecurity
practices and policies.

The Gogo Biz network adheres to the latest developments in enterprise networking design. We provide secure network design with firewall protection, and utilize multiple data centers for redundancy and failover, and resiliency when responding to and recovering from critical incidents.

Onboard aircraft equipment: Gogo secures all onboard aircraft equipment that is manufactured and delivered as part of the Gogo Business Aviation inflight connectivity system.

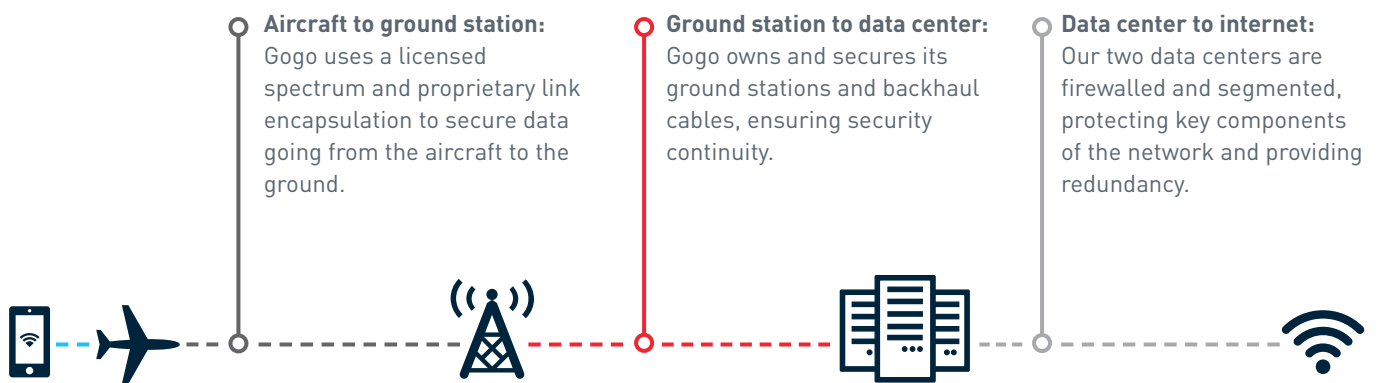
By design, Gogo onboard aircraft equipment is secured through network isolation, which includes:

- Open 802.11 and secure 802.11 Wi-Fi/wireless via WPA2.
- Aircraft system intrusion security is provided by the Gogo-supplied router. All Gogo AVANCE products are shipped with the router technology built in. Any connection to avionics and other flight systems are listen-only, meaning that the other systems are not accessible through the Wi-Fi components.
- By design, other airborne system components are inaccessible from the Wi-Fi clients due to network isolation.

Gogo Network Operations Center (NOC): The Gogo Network Operations Center (NOC) provides Tier 1 & Tier 2 monitoring and troubleshooting of all elements of the Gogo Business Aviation mobile broadband network. Located in Chicago, the NOC provides continuous operations support.

The NOC staff consists of data systems, wireless and IP support analysts. Security is assured through industry-grade secured networking between the access-controlled NOC and the secured Gogo data centers.

WHAT HAPPENS WHEN YOU PUSH SEND





GOGO CYBERSECURITY BEST PRACTICES

Gogo Business Aviation adheres to the following best practices to ensure security at all stages in design and development of its network, products and processes. This is not intended to be a comprehensive list of all activities performed by Gogo's cybersecurity personnel.

MONTHLY SYSTEM VULNERABILITY ASSESSMENTS	Independent third party security firms perform monthly external and internal assessments against Gogo's assets. Results of these assessments are reviewed and any noted deficiencies are tracked and remediated.
ROUTINE PENETRATION TESTS AND FIREWALL ANALYSIS	Routine and ad-hoc external and internal penetration tests are performed against Gogo's assets. Results of these penetration tests are reviewed and any noted deficiencies are tracked and remediated.
ROUTINE FIREWALL AUDITS	Security audits are performed against all production firewalls. Both a manual review process and automated toolsets are utilized to ensure configurations are secure. Online backups of firewall configurations are maintained to make sure a rapid rollback can be performed successfully if there are any issues identified.
GENERAL SECURITY AWARENESS TRAINING	Both full-time employees and contractors are required to attend security awareness training within 30 days of their hire date and again at least annually.
SECURE CODING AWARENESS TRAINING	Both full-time employees and contractors who are members of the application development departments are required to attend annual awareness training focused on secure coding standards and best practices.
FAA CYBERSECURITY	Gogo works closely with the FAA and other aviation stakeholders to define new cybersecurity standards to anticipate and protect against current and future cyber threats. Gogo's certification process follows the latest FAA and RTCA policies to ensure safety of flight for Gogo-equipped aircraft.

COMPLIANCE CERTIFICATIONS	Gogo is PCI:DSS Level 1 Certified and in the process of renewing an ISO 27001:2013 certification for Gogo's credit card processing environment. Copies of these certificates are available upon request.
SECURITY POLICIES	Cybersecurity policies are maintained and updated on an internal corporate site which is accessible to all employees and contractors. The policies, standards, and configuration guide are based on requirements sourced from the NIST CSF and ISO 27001:2015 frameworks.
EVENT LOG MONITORING	Gogo utilizes a trusted third-party security firm's Security Operations Center (SOC) to monitor production system event logs 24/7/365. Any anomalies are reported immediately and thoroughly investigated.
ENDPOINT SECURITY	All Gogo employee workstations are encrypted and have updated anti-virus, anti-malware, intrusion prevention and firewall technology installed.
PRIVILEGED USER ACCESS REVIEWS	Ongoing user access reviews are performed against production systems. Business stakeholders verify appropriate access levels for identified users.
CYBERSECURITY STEERING COMMITTEE	Ongoing meetings of key business stakeholders ensure security is addressed for various departments of the organization. Updates are provided to key business stakeholders from the Cybersecurity team and takeaways are implemented based on the criticality of the information provided.
RISK ASSESSMENTS	Ongoing risk assessments ensure new risks to Gogo are quickly identified and remediation efforts are prioritized and implemented.

For more information about our cybersecurity solutions and best practices, see business.gogoair.com/solutions/cybersecurity.



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