Accelerating Critical Care. We Have Liftoff.

CALSTAR builds an air-to-ground dispatch system that connects air transport to lifesaving care.

> "The Internet of Everything is connecting our people, processes, and data in ways that we couldn't do before. The technology enhances operational control. Operations has greater peace of mind, because they know that our technology helps ensure safety and security."
>
> *– Julie Hyde, IT Director at CALSTAR*

Challenges

- Bring air-to-ground dispatch capabilities in-house
- Ensure always-available communications among the CALSTAR Communications Center (CALCOM), flight crews, medical teams, first responders, and hospitals
- Keep everything simple so that technology is invisible and teams can focus on safety

California Shock Trauma Air Rescue (CALSTAR) is a nonprofit regional air ambulance service. Every day, its operations save lives, reduce disability, and accelerate recovery for victims of trauma and illness by bringing critical care to the scene. CALSTAR's air ambulances can get to patients and transport them to hospitals throughout California and northern Nevada faster and more smoothly than ground transportation—which can mean the difference between life and death. Approximately 60 percent of CALSTAR flights support regional 911 emergency services networks and the other 40 percent support interfacility transports (ISTs).

When the Federal Aviation Administration (FAA) updated its operational control guidance in 2009, CALSTAR initiated its own air-to-ground communication system to comply with those changes. No simple task. The new infrastructure had to accommodate myriad types of radio and handset communications, deliver nonstop availability—because lives are at stake—and provide peace of mind for everyone.

"When crews are in the helicopter, we don't want them having to think about the technology," says Julie Hyde, IT Director at CALSTAR. "Technology should be reliable, allowing them to concentrate on flying the aircraft or caring for a patient."

CALSTAR already had a Cisco® switching and routing infrastructure, as well as Cisco Unified Communications Manager for voice communications. But dispatch capabilities had to be integrated while keeping all of the components—from dispatchers' workstations and base radios to mountaintop microwave radio repeaters—as reliable as humanly possible. To the CALSTAR team, it made sense to use their existing Cisco investment and maintain a one-vendor solution.

Case Study | California Shock Trauma Air Rescue

Size: 220 employees | Location: McClellan, CA USA | Industry: Aviation and Healthcare

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It just made sense to have a fully integrated air-to-ground communication system that connects everyone involved in patient transport.

Solutions

- Built on the existing Cisco network as its high-availability platform
- Created a control center using Cisco Unified Communications solutions
- Deployed Cisco Instant Connect for fast, centralized communication among first responders, CALCOM, helicopter bases, flight crews, and hospitals, regardless of radio endpoints used

Unifying for Simplicity

CALSTAR deployed Cisco Unified Enterprise Attendant Console and Cisco Instant Connect (formerly Cisco IP Interoperability and Collaboration System) with its Cisco Unified Communications Manager platform. This gives them a unified solution with a single recording capability. Each team member in CALSTAR's Communications Center (CALCOM) has a single desktop with their apps and a headset, from which they can communicate with first responders, helicopter pilots, and base stations. They also can bridge hospitals into the communication flow when they need to.

Buying Handset Flexibility

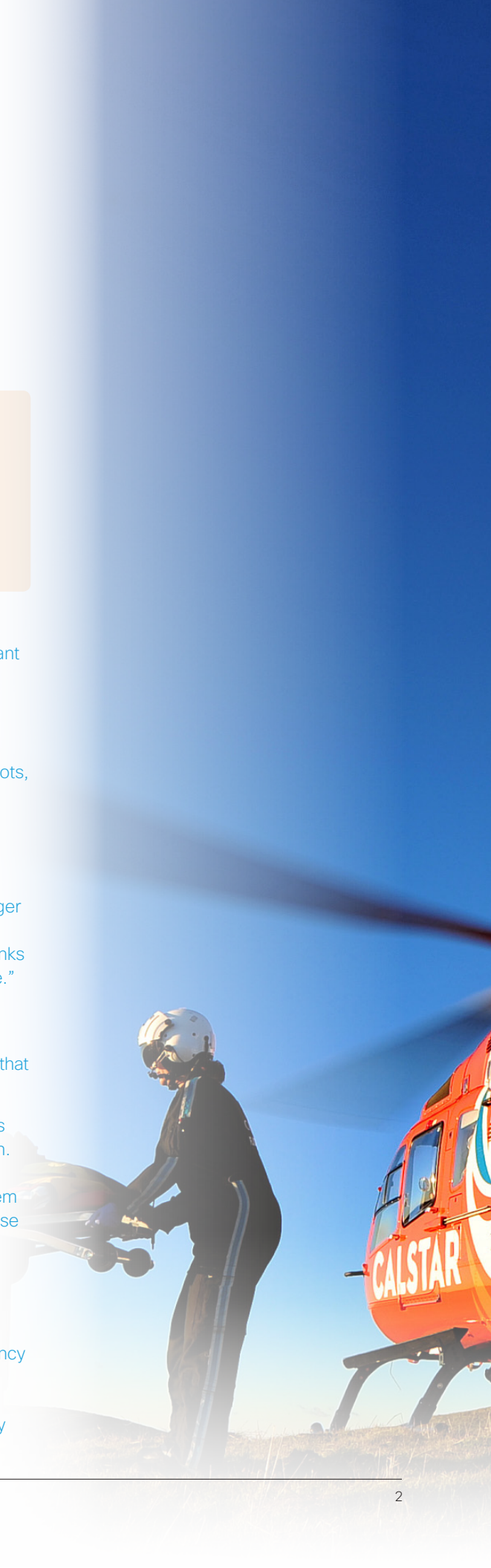
"The Cisco solution gave us options for our radios," says Paul Morales, IT manager and senior network and systems engineer for CALSTAR. "We knew we could interface and work with whatever radio, repeater, satellite, and communication links or devices that we needed to. That's possible because of our Cisco architecture."

Increasing Uptime and Reliability

"We increased our uptime significantly," says Hyde. "We attribute the majority of that to being a Cisco shop."

CALSTAR builds resiliency into every aspect of its operations. Its helicopter bases have standby propane generators in the event that commercial power goes down. Some bases also provide redundancy for IP or microwave backhaul. CALCOM connects to two critical cloud-based services: its computer-aided dispatch system and SkyConnect application for tracking aircraft. The data center connects to these services through multiple ISPs and load-balances traffic between connections. If one ISP goes down, CALSTAR's connections don't.

"Radio, email, and text communications all run through the core network," says Morales. "If a core switch should fail, the effects would only be noticed by the IT department. If a Cisco Instant Connect server virtual machine goes down, resiliency kicks in and no one is affected. If a base loses its primary fiber circuit, its backup circuit responds with our Cisco routing. Even if a base loses both circuits, we dial back to Cisco Unified Survivable Remote Site Telephony, and they still have a way to communicate."



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Results

- Accelerated lift times
- Simplified communications and increased accuracy for high situational awareness
- Enhanced operational control

Reducing Lift Time Saves Precious Minutes

When an emergency call arrives at CALCOM from a public safety answering point (PSAP), the team springs into action. While the caller is on the line, the communications specialist notifies the nearest helicopter base that there is a potential flight. The flight crew acknowledges the communication and checks weather. Assuming it's clear to fly, they accept the flight. Meanwhile, the communications specialist can communicate in real time with the PSAP caller, estimating lift time and arrival at the scene without having to hang up and call back.

After the crew lifts off, communications are delivered through mountaintop repeaters. CALCOM is in contact with the aircraft, briefing flight crews on what they should expect when arriving on scene. CALCOM stays in touch with that aircraft as it arrives, lands, picks up the patient, and transports the patient to the nearest appropriate hospital. At the same time, CALCOM notifies the hospital of the patient's status so that the receiving staff can be prepared. CALCOM can also keep the pilot briefed of any potential issues with the landing zone.

Nothing Lost in Translation

Before, communications involved multiple back-and-forth steps between first responders, the outsourced dispatch center, CALSTAR's dispatch team, the aircraft, and the hospitals. Today, CALCOM staff find it easier to communicate with all critical team members from a single place. Direct communications cuts minutes out of the process and minimizes the potential for misunderstandings.

"The Cisco platform helps reduce our lift times and expedites patient care," says Hyde. "Our crews can get off the ground and to the scene faster, because our communication platform is solid, working, and direct."

Faster, More Accurate Care

That same direct communication also makes flight and medical crews' jobs easier. Now they can make specific requests before arriving on calls or check a hospital's resources. For example, if they need antivenom for a snakebite, they can check with the hospital or divert to a different care facility if necessary. All without losing time.

Increased Operational Control

"The Internet of Everything is connecting our people, processes, and data in ways that we couldn't do before," says Hyde. "The biggest change is that we have better operational control now. Operations has greater peace of mind and so do crews, because they know that our technology helps ensure their safety and security."

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Tying Everyone Together

CALSTAR has begun using Cisco WebEx® technology to bring its growing organization closer together. CALSTAR anticipates using video conferencing, instant messaging, and other features to help connect crews, mechanics, and administration.

Opening New Opportunities

Because the network platform is so stable, CALSTAR was able to launch a transfer center that serves as a centralized communication hub for hospitals that transfer patients to specialty care centers, tertiary care, or home. Hospitals can contact the All-Access Transfer Center to initiate ground, air, or other type of transport and specify the level of care needed to get a patient from point A to point B. The new transfer center enables nurses to make one call, and the All-Access Transfer Center takes care of everything.

"We can use our same Cisco platform to deliver service that wasn't possible before," says Hyde, "and we are looking at extending critical care education courses to our hospital partners through the platform as well. We'll be able to use video, create video-on-demand sessions for later viewing, and provide high-quality education digitally, in addition to providing on-site classes."

It Just Works

"It's all about keeping it simple and easy to use for our flight crews, CALCOM, and the transfer center," says Morales. "They can focus on providing critical patient care and transport, sometimes in the most horrific situations. They know that when they push that button—the system works."

Products & Services

Data Center
Routing and Switching
Fabric Interconnects
Network Management
Virtualization
Applications

Voice and IP Communications
- Cisco Unified Enterprise Attendant Console
- Cisco Instant Connect (formerly Cisco IP Interoperability and Collaboration System)
- Cisco Unified Communications Manager
- Cisco WebEx

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