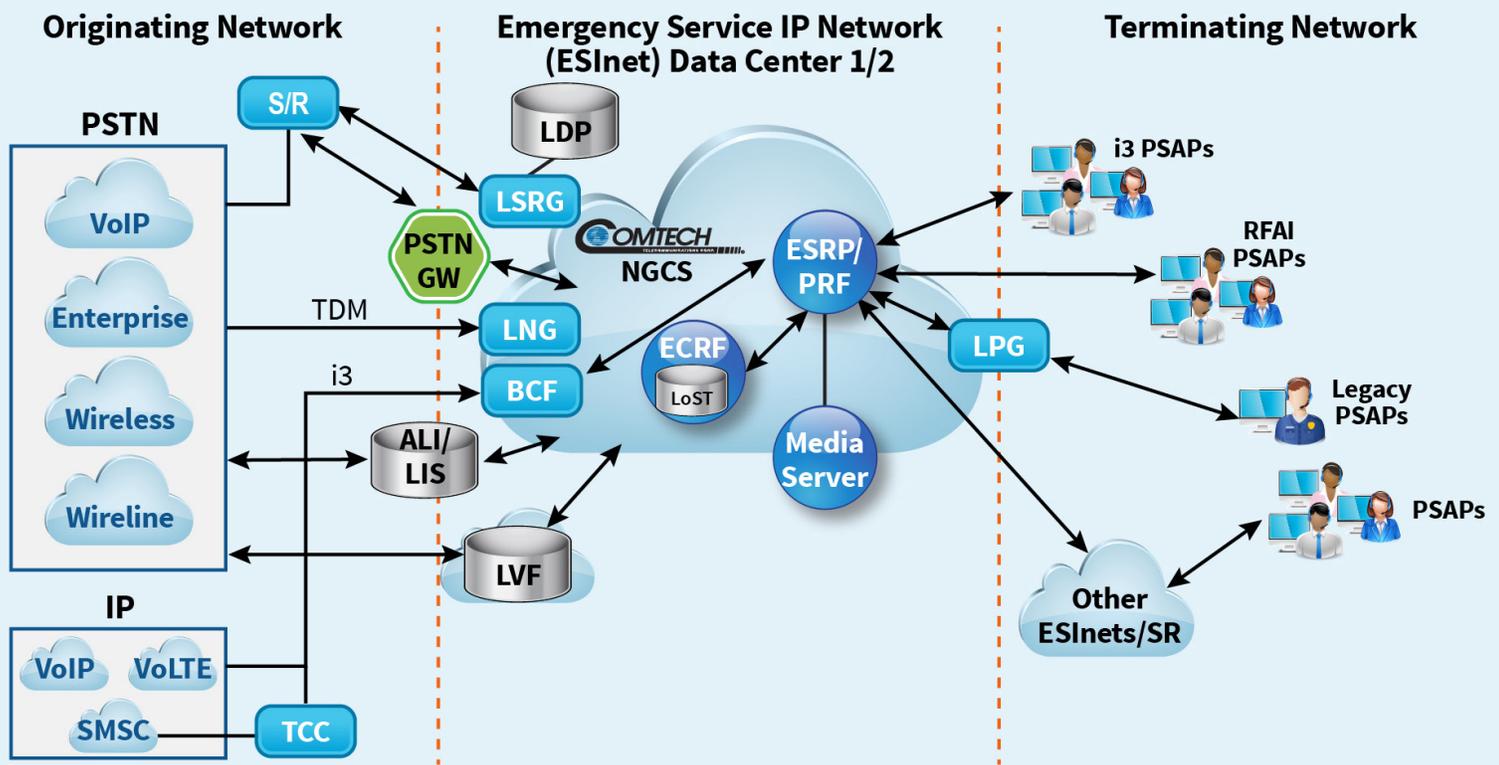# NEXT GENERATION CORE SERVICES

Connecting a Network of Networks

As the public safety industry moves towards new technology, states, regions, and local jurisdictions need to adapt to the changing landscape, keep up with the demand for new ways to communicate, and replace legacy call routing tools with Next Generation 9-1-1 (NG9-1-1) equipment. The Comtech Next Generation Core Services (NGCS) solution offers an Emergency Services Internet Protocol network (ESInet) and seamlessly connects originating service providers with public safety answering points (PSAPs).

Our market-leading NGCS configuration is modular, scalable, and has been implemented at state, region, and county levels. NGCS offers a transitional replacement solution for legacy selective-router-based 9-1-1 networks. This NENA i3-compliant solution enables end-to-end Internet Protocol (IP) call routing to the PSAP, providing Time-Division Multiplexing (TDM)-to-Internet Protocol (IP) call conversion and location-based routing. Supporting IP connectivity means Message Session Relay Protocol (MSRP) for text and other media types, and it also enables PSAPs to receive multimedia messages––text, video, and voice calls––when the technology and time is right for each individual PSAP.

Comtech NGCS is highly reliable, resilient, and redundant. Our solution is composed of redundant central system components that provide load sharing and load balancing with failover capability. With locally and geographically redundant architecture, the system operates as a single entity, even under the most catastrophic conditions, and its design provides a seamless transition in call-processing capacity from platform to platform and site to site, ensuring high availability and continued emergency call processing.

Originating Network

PSTN
- VoIP
- Enterprise
- Wireless
- Wireline

IP
- VoIP
- VoLTE
- SMSC

S/R

TDM

i3

TCC

ALI/LIS

LVF

Emergency Service IP Network (ESInet) Data Center 1/2

LDP

LSRG

PSTN GW

LNG

BCF

Comtech NGCS

ECRF — LoST

ESRP/PRF

Media Server

LPG

Terminating Network

- i3 PSAPs
- RFAI PSAPs
- Legacy PSAPs
- PSAPs
- Other ESInets/SR

Multiple Deployment Options

- **Software as a Service (SaaS) / Hosted:** Engineered for use with widely available hardware and with the greatest capacity for expansion, the NGCS is operated on equipment owned and maintained by our public safety team at Comtech's fully redundant, geodiverse data centers. This model is ideal for public safety entities desiring a speedy deployment and a lower capital expenditure.
- **In-Network / Managed Service:** Entirely resident within your region, the NGCS hardware is maintained by the customer and installed in fully redundant, geodiverse locations. Comtech provides a managed service to operate the NGCS software. This model is ideal for public safety entities desiring a lower operational expenditure and/or a dedicated system.
- **Hybrid:** A combination of the hosted and in-network models, the NGCS is modular, flexible, and can be configured to meet the customer's needs.

Comtech NGCS Functional Suite

Our NGCS configuration features the following set of key functional elements and interfaces:

- **Emergency Services Routing Proxy (ESRP)** – Coordinates call routing via ECRF or legacy modes.
- **Policy Routing Function (PRF)** – Provides rules-based call routing functionality.
- **Emergency Call Routing Function (ECRF)** – Provides call-routing instructions to the ESRP, based on GIS data.
- **Location Validation Function (LVF)** – Validates a caller's location against the geospatial MSAG derived from the master GIS database.
- **Media Conversion Gateways [Legacy Network Gateway (LNG)/Legacy Selective Router Gateway (LSRG), Legacy PSAP Gateway (LPG)]** – Provides legacy network support during Enhanced 9-1-1 (E9-1-1) to NG9-1-1 transition phase.
- **Border Control Function (BCF)** – Secures entry into the ESInet via a firewall and a session border controller (SBC).
- **Conference Bridge** – Enables call conferencing within the NGCS.
- **Open Architecture and Open Interfaces** – Enables modular design and industry-standard communication between vendor partners.

Each deployment option––hosted, managed service, and hybrid–– contains these elements, as applicable.

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Enabling the Transition

To support public safety's adoption of NG9-1-1 and NENA i3 standards and specifications, Comtech has invested significant resources in the development of its NENA i3-compliant NG9-1-1 solution and now holds competitive local exchange carrier (CLEC) status in almost all states. This status provides significant value in enabling the transition between legacy systems and the NGCS solution.

Engineering

All of Comtech's public safety technology is engineered to exceed the "five nines" standard of reliability, using carrier-grade components. Comtech designs its systems for continuous 9-1-1 transaction processing, and we achieve this performance capability along with the utmost reliability through the intelligent use of a highly redundant system architecture.

Industry Compliance

- **National Emergency Number Association (NENA):** NENA i3
- **Alliance for Telecommunications Industry Solutions (ATIS):** JTD-110, IMSESINET, NGES, IMS911, ELOC, ESIF
- **Internet Engineering Task Force (IETF):** SIPCORE, ECRIT, SIPREC, GEOPRIV

Supported Interfaces

Interfaces as described in NENA-STA-010.2-2016 (originally 08-003), including:

- SIP/RTP
- HELD
- MSRP
- LoST
- Secure portal interface for data management
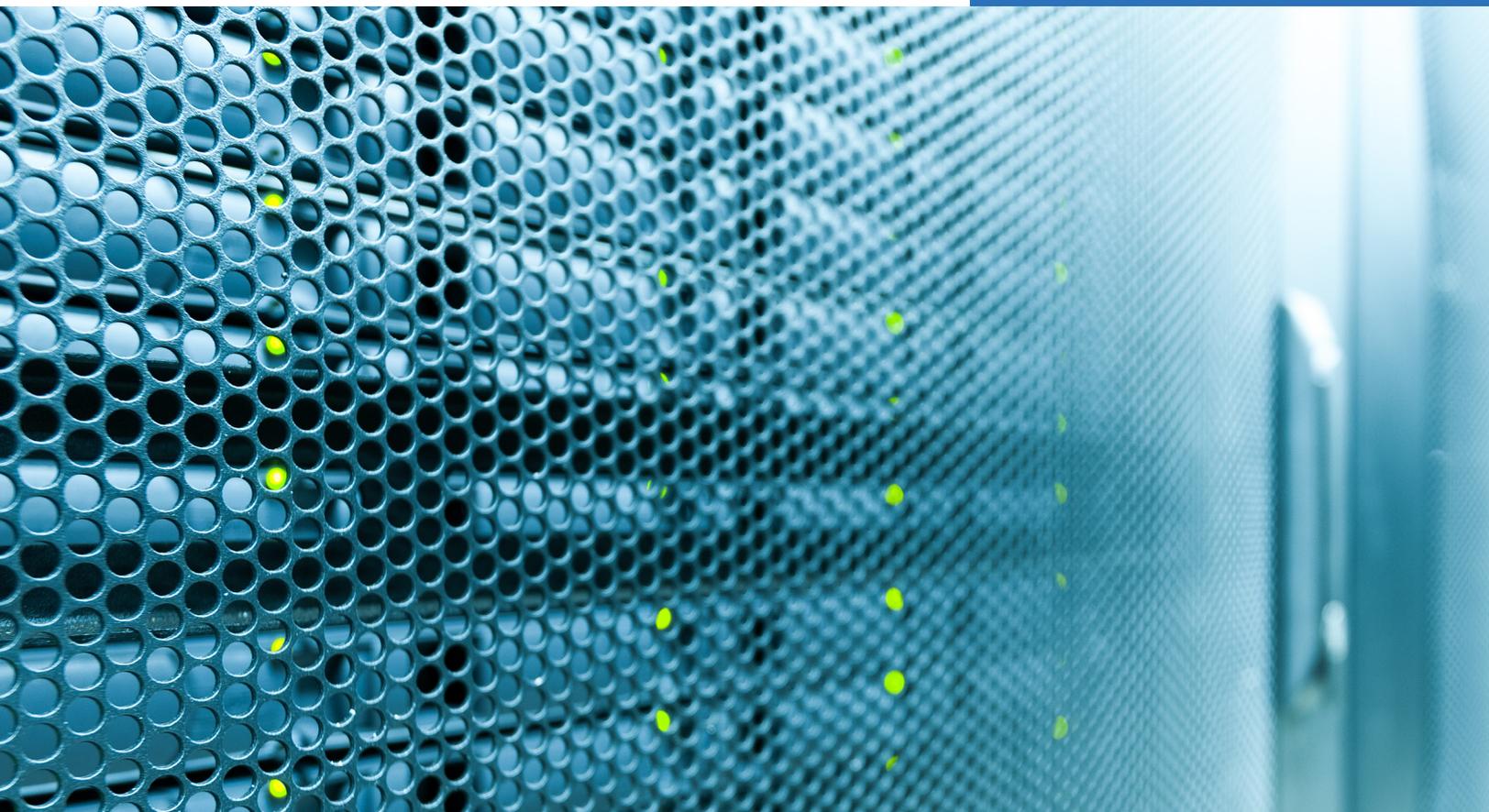
Experience

Comtech NGCS offers a highly available and geographically redundant NENA i3-compliant solution for NG9-1-1 deployments, designed around the philosophy that every call matters.

Comtech is a leading end-to-end NG9-1-1 solution provider with ~36% market share in Next Generation Core Services. We have been deploying NG9-1-1 systems for over 10 years and are an industry leader in both ESInet and Text to 9-1-1 deployments.

Key Feature	Benefit
Active-Active Design	Offers the highest availability, with no manual interaction required.
Quad-Redundant Processing	Both geographic and local redundancy in the software, increasing availability.
Geographic Redundancy	Always deployed in a geographically redundant manner, increasing availability.
CPE Interoperability	Successfully tested with the most popular customer premise equipment (CPE) applications.
End-to-End Functionality	Supports true end-to-end functionality, taking 9-1-1 traffic all the way from the carrier circuits (aggregation services) to the PSAP demarcations.
MSRP Text to 9-1-1 Support	Enables native MSRP Text to 9-1-1.
Multiple Deployment Models	Can be deployed in a dedicated in-market solution, as a Comtech-hosted service, or in a hybrid configuration.
Proven NENA i3 Flexibility	Successfully deployed in legacy transition and end-state architectures using other NENA i3-compliant components within the solution.
Flexible Routing Changes	Allows for flexible updates to routing rules.

About Comtech Safety & Security Technologies

Comtech Safety & Security Technologies (SST) has been demonstrating its commitment to public safety for over 20 years. We deliver reliable solutions for Next Generation 9-1-1 (NG9-1-1), wireless Enhanced 9-1-1 (E9-1-1), Text to 9-1-1, VoIP & VoWiFi E9-1-1 and related emerging technologies. Service Providers, states, and local jurisdictions nationwide rely on our portfolio of mission-critical products and services.

2401 Elliott Avenue, Suite 200
Seattle, WA 98121
Phone: 206.792.2000
SST-Sales@comtechtel.com
www.comtech911.com