



# Real Time Communications Conference and Expo at Illinois Tech

IEEE International Conference



# The Future of 911

## Ubiquitous Sharing of Critical Data

Live Demonstration

October 4, 2023



# Meet our speakers



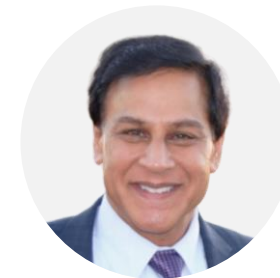
Eric Hagerson  
**Public Safety &  
Security  
Government  
Affairs Director**



Chandy Ghosh  
**Chief Operating  
Officer & General  
Manager,  
Emergency  
Services**



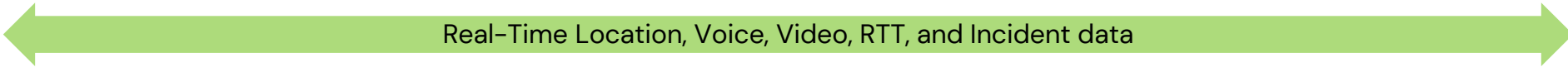
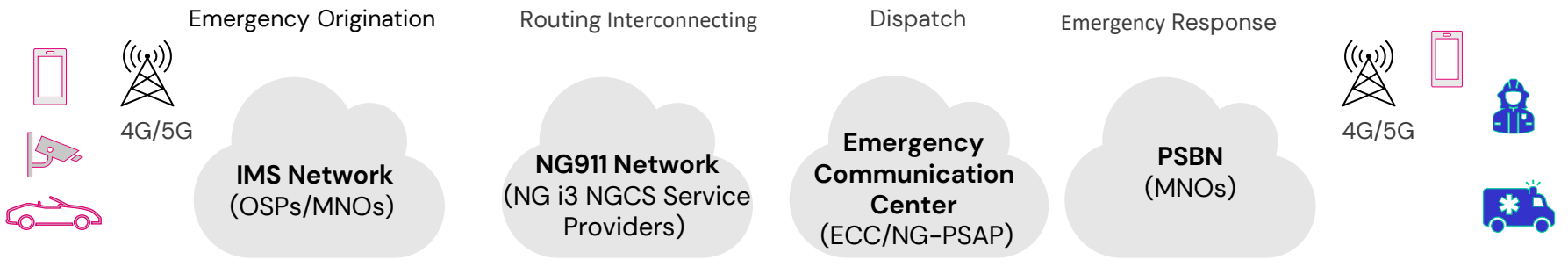
Carol Davids  
**Professor,  
Computer Science**



Suresh Gursahaney  
**President & Chief  
Executive Officer**



## Next Generation 911 Vision





# What's This All About?

A secure, IP-based, open-standards system comprised of hardware, software, data and operational policies and procedure which:

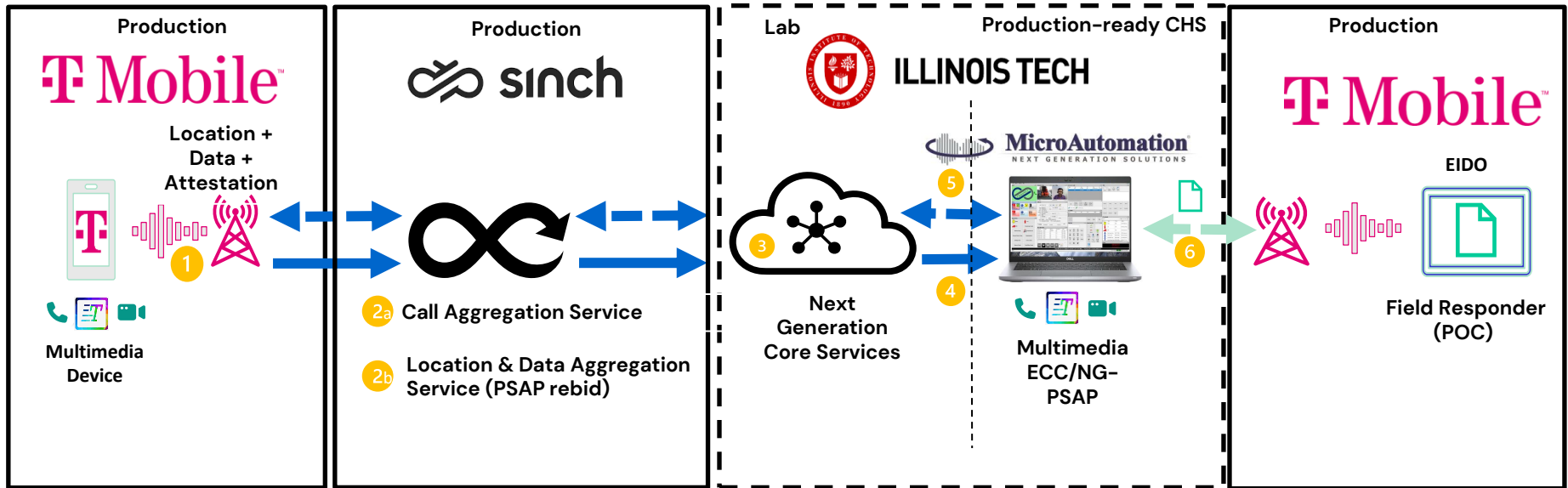
- ✓ Provides standardized interfaces from emergency call and message services to support emergency communications
- ✓ Processes all types of emergency calls, including voice, text, data and multimedia information
- ✓ Acquires and integrates additional emergency data useful to call routing and handling
- ✓ Delivers the emergency calls, messages and data to the appropriate NextGen ECC and other appropriate emergency entities based on the location of the caller
- ✓ Supports data, video and other communications needs for coordinated incident response and management
- ✓ Interoperates with services and networks used by field responders to facilitate emergency response



## Proof-of-Concept Demo & Objectives

Industry first end-State NENA NG911 reference architecture for call signaling & media control, between 911 caller & Public Safety to improve incidence response:

1. NG911 i3 voice call delivery with Tower & DBH Location & Additional Data for ALL-equivalence
2. NG911 i3 RTT delivery
3. NG i3 Voice call with mid-call upgrade to RTT with STIR/SHAKEN
4. NG911 i3 Voice call using commercial GSMA IR.94 (POC)



➤ Live call origination in native NENA NG i3 format

➤ Seamless IP Connectivity & Interoperability across network domains

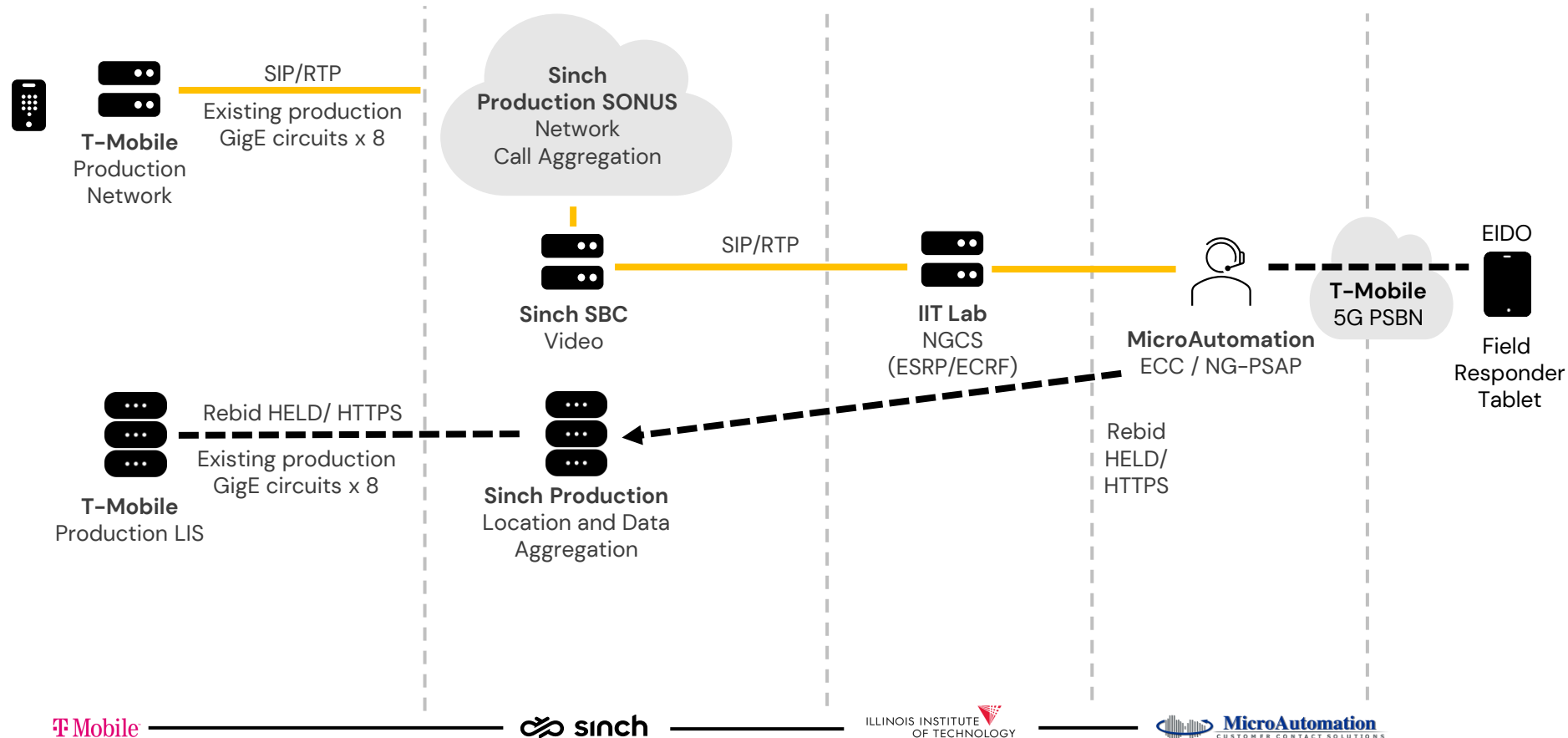
➤ Emergency Incident Data Object (EIDO) conveyance

→ i3 SIP Call

↔ i3 Location

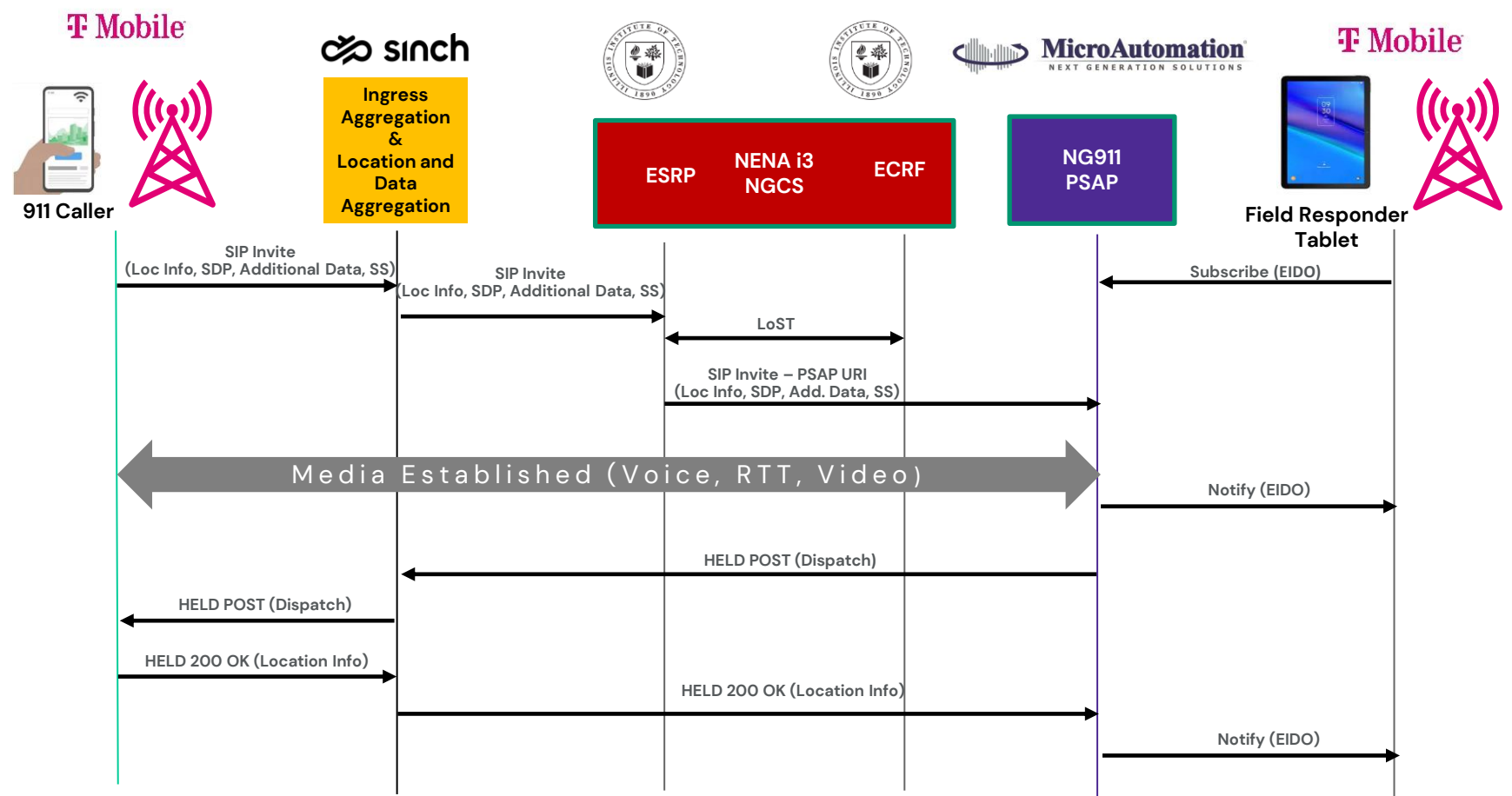


## Conceptual Network Topology for Voice, RTT, Video Calling





## Sequence Diagram





## STIR/SHAKEN Defined

A framework of interconnected standards where calls traveling through interconnected phone networks can have their caller ID "signed" as legitimate by originating carriers and validated by other carriers before reaching consumers.

# STIR

SECURE TELEPHONE IDENTITY REVISITED

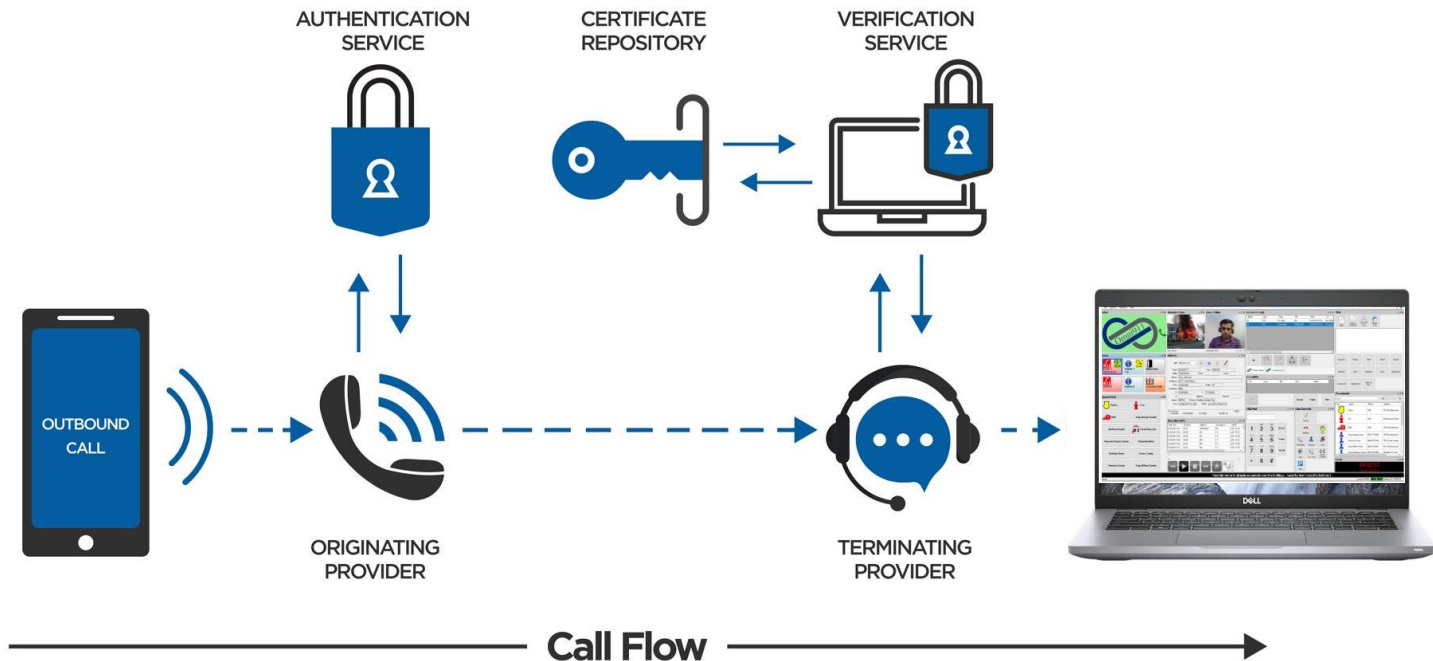
# SHAKEN

SIGNATURE-BASED HANDLING OF ASSERTED  
INFORMATION USING TOKENS STANDARDS





## STIR/SHAKEN Framework





# STIR/SHAKEN Attestation & Validation

## A

### Full Attestation

Carrier has confidence in identity of caller and caller's right to use the caller ID information presented

- The originating service provider knows the customer and their right to use the phone number.

## B

### Partial Attestation

Carrier has confidence in identity of caller but not caller's right to use the caller ID information presented

- The service provider knows the customer but not the source of the phone number.

## C

### Gateway Attestation

Carrier cannot certify the identity of caller or their right to use caller ID information presented. Carrier merely acted as a gateway to place call on network

- The service provider has originated the call onto the network but can't authenticate the call source e.g., international gateway.



## STIR/SHAKEN Example

The screenshot displays the Omni911 dispatch software interface. A central window shows a call in progress with the following information:

- Call ID: 911
- Number: 5712831436
- Time: 00:46
- Call Status: A (Answered)

The interface includes several panels:

- Lines:** Shows various call lines including 911, 911-2, 911-3, Emergency-1, Emergency-2, Admin-1, Admin-2, Admin-3, Personal Line, and Conf Room.
- Alert:** Displays the Omni911 logo.
- Line Controls:** Includes buttons for Answer, Release, Consult, Bridge, Conf, Transfer, Mute, Pub Hold, Prv Hold, RTT/TDD, and Park.
- Active Chat/SMS:** A section for managing active chats and SMS messages.
- Volume Control:** A volume slider and a clock showing 17:17:07 on Tue Sep 05, 2023.

The main call window shows the following details for ANI/ALI: 911 - Connected:

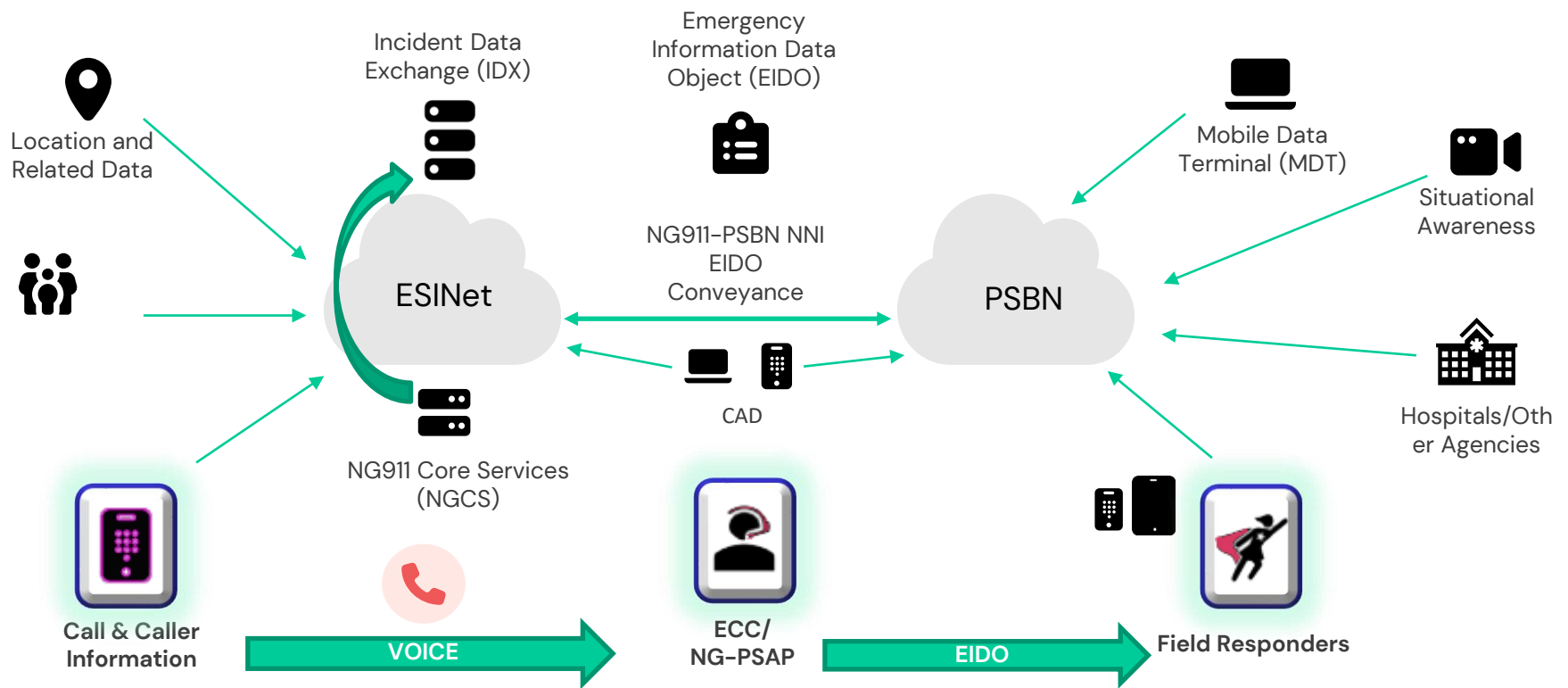
- ANI: 5712831436
- ALI: 5712831436
- Date: 2023-09-05
- Time: 17:17:18
- Name: Jack Dawson
- Address: [Redacted]
- City: [Redacted]
- State: [Redacted]
- Zip: [Redacted]
- Country: [Redacted]
- Building: [Redacted]
- Floor: [Redacted]
- Room: [Redacted]
- Longitude/X: -77.4414874
- Latitude/Y: 38.8430195
- Elevation/Z: 107
- Height From: [Redacted]
- Uncertainty: 100
- Confidence: [Redacted]
- Class of Service: WPH2
- Class Des: [Redacted]
- ADDL Loc Info: [Redacted]
- Unit: [Redacted]
- ESN: [Redacted]
- Neighborhood: [Redacted]
- Road Section: [Redacted]
- Place Type: [Redacted]
- Road Branch: [Redacted]
- Sub: [Redacted]
- Unincorporated: [Redacted]
- Postal Community: [Redacted]
- Police Name: Sully District Police Station
- Police Phone: 1-70
- Fire Name: Centerville Volunteer Fire Department, Station 17
- Fire Phone: 1-70
- EMS Name: Chantilly Fire and Rescue, Station 15
- EMS Phone: 1-70
- Landmark: [Redacted]
- Customer Comment: [Redacted]
- ALI Provider Name: AT&T Wireless
- ALI Provider ID: [Redacted]
- ALI Provider Phone: [Redacted]
- ALI Pro: [Redacted]

The interface also shows a table of Active Calls (1) and Remote Video options.



## Demo Call Flow – Voice

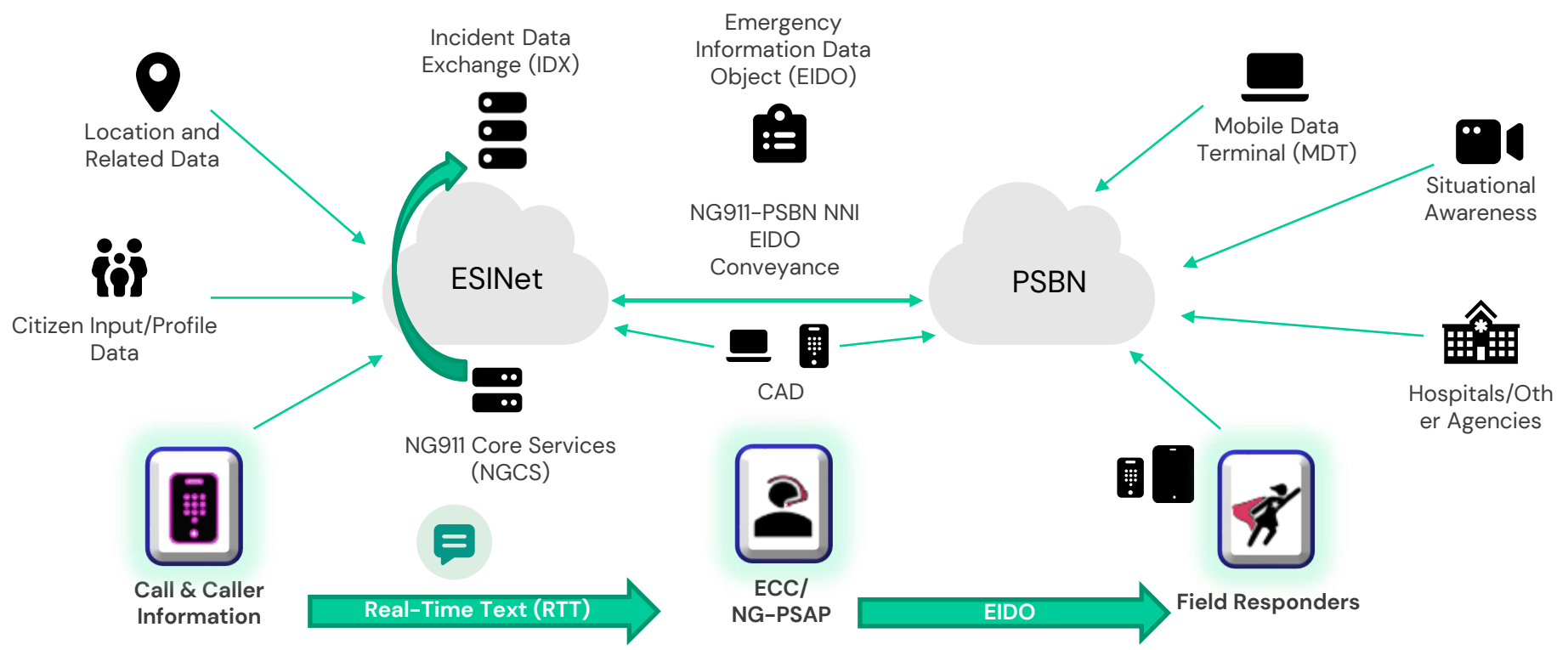
(for purposes of this demo, STIR/SHAKEN not configured & provisioned)





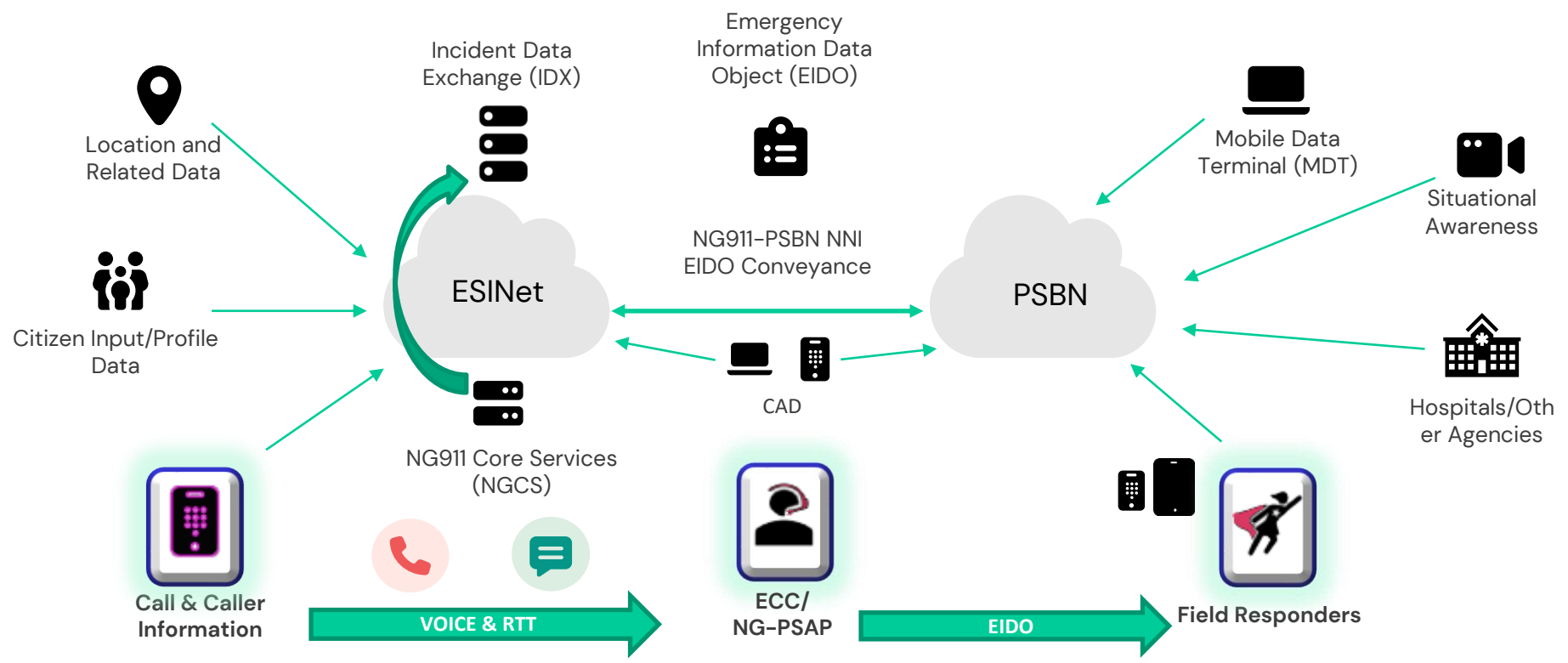
# Demo Call Flow – Real-Time Text

(for purposes of this demo, STIR/SHAKEN not configured & provisioned)



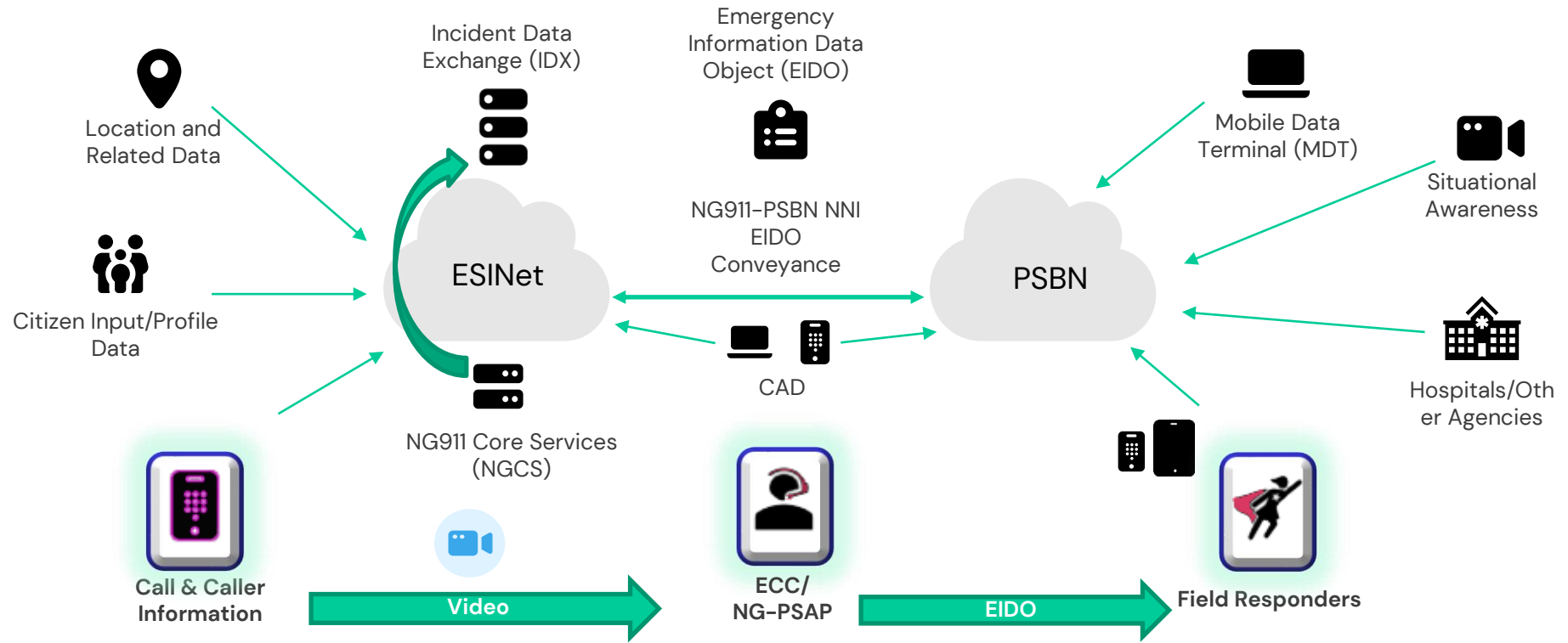


## Demo Call Flow – Voice and RTT (STIR/SHAKEN configured & provisioned)





## Demo Call Flow – Video (STIR/SHAKEN configured & provisioned)





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Questions?





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Special thanks to our team

and

**THANK YOU** for coming!



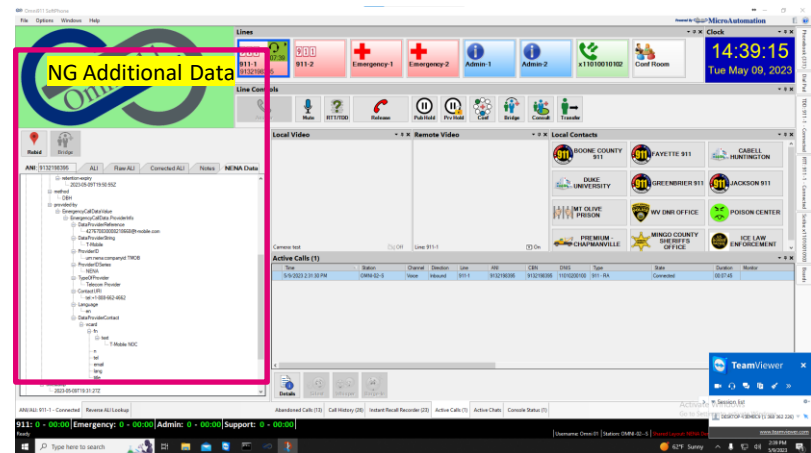
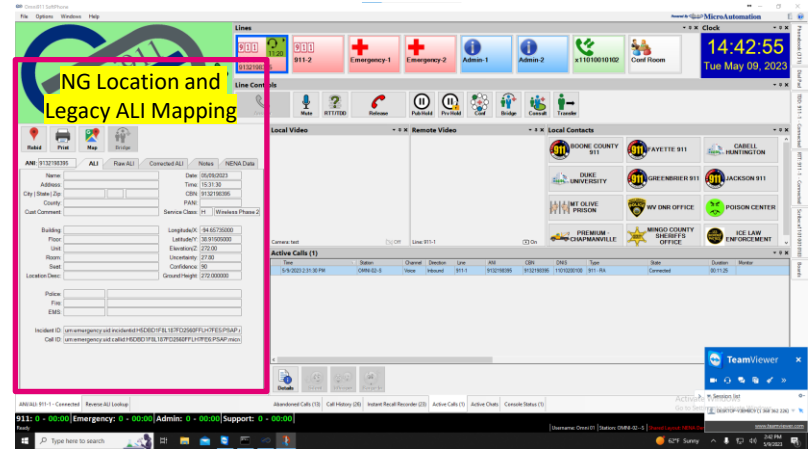
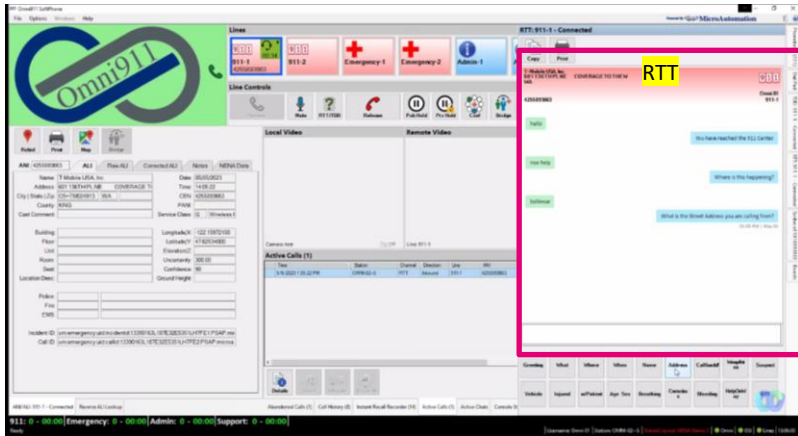
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A decorative background graphic consisting of a fan of rays emanating from the bottom left corner, with various shades of gray and white. The rays are of varying lengths and widths, creating a sense of depth and movement.

# Appendix

# Industry first NG911 call delivery

Voice and RTT call delivery with Location and Additional Data



# EIDO Conveyance

## Proof of Concept

Key	Value
<b>General</b>	
\$id	urn:emergency:uid:incidentid:1858D548L18771F5CD8BLH7FC1:PSAP:qa.microatuomation.com
lastUpdateTimeStamp	2023-04-12T16:27:18.551200610-04:00
updatedByAgencyReference	qa.microatuomation.com
updatedByAgentReference	OMNI.18@qa.microatuomation.com
eidoVersion	1.0
issuingElementIdentification	qa.microatuomation.com
<b>callComponent</b>	
\$id	urn:emergency:uid:callid:1858D548L18771F5CD8BLH7FC2:PSAP:qa.microatuomation.com
lastUpdateTimeStamp	2023-04-12T16:27:15.215045607-04:00
updatedByAgencyReference	qa.microatuomation.com
updatedByAgentReference	OMNI.18@qa.microatuomation.com
queueIdentifier	911@qa.microatuomation.com
standardPrimaryCallType	nonemergency
direction	incoming
callStartTimestamp	2023-04-12T16:27:15.215078810-04:00
answerDate	2023-04-12T16:27:18.548477080-04:00
callStateRegistryText	callAnswered
callBackReference	114b33cf-c705-4484-93bd-cdcc9fb5e6f7
agentReference	OMNI.18@qa.microatuomation.com
locationReference	fd71e35b-2002-4550-b983-036780cbc91f
personReference	b6033410-f518-47d4-807a-3d7364371273
sipIdentity	5192c56f138f0afc390d98e0682834ab@172.25.55.5:5060
<b>callbackComponent</b>	
\$id	114b33cf-c705-4484-93bd-cdcc9fb5e6f7
lastUpdatedTimeStamp	2023-04-12T16:27:15.215249975-04:00
updatedByAgencyReference	qa.microatuomation.com
updatedByAgentReference	OMNI.18@qa.microatuomation.com
callbackInformationUri	sip:5702677604@172.25.55.5
deviceContactHeader	<sip:5702677604@172.25.55.5:5060;transport=tcp>
<b>agentComponent</b>	
\$id	qa.microatuomation.com
agencyRoleDescriptionRegistryText	CallReceiving
agencyType	PSAP
lastUpdatedTimeStamp	2023-04-12T16:27:15.214861511-04:00
updatedByAgencyReference	qa.microatuomation.com
<b>agentComponent</b>	
\$id	OMNI.18@qa.microatuomation.com
lastUpdatedTimeStamp	2023-04-12T16:27:18.551137422-04:00
updatedByAgencyReference	qa.microatuomation.com
updatedByAgentReference	OMNI.18@qa.microatuomation.com
agentWorkstationPositionIdentification	BD_01
agentRoleRegistryText	Call Taking
agencyReference	qa.microatuomation.com
<b>locationComponent</b>	
\$id	fd71e35b-2002-4550-b983-036780cbc91f
lastUpdatedTimeStamp	2023-04-12T16:27:15.761056556-04:00
updatedByAgencyReference	qa.microatuomation.com
locationTypeDescriptionRegistryText	Caller
locationDescriptionText	Caller
	<ns2:presence xmlns:ns2="urn:ietf:params:xml:ns:pdp" entity="pres:1fqy9424ez9.4f3hd41.gbb@ltsadrrws.west.com"> <ns2:tuple uri="ltsadrrws">

# What does NG911 RTT bring to the table?

- **NG911 RTT to RTT without gateways**
  - 5G Fast
  - Simultaneous Voice and Text (Full Duplex)
  - RTT Habla español
  - Conversational text
  - Easy even for first time users
  - Full character set and more
  - High Fidelity



Bottom line . . . .

RTT to RTT delivers greater communication access for public safety, those who use relay services, as well as the greater population

Both PSAPs and 911 callers benefit from this technology

<https://www.t-mobile.com/news/community/t-mobile-and-sinch-deliver-ng911-rtt>

# IR.94 video call with NG-PSAP call Handling

