



***Cal* OES**

GOVERNOR'S OFFICE
OF EMERGENCY SERVICES

Emerging Technologies in the California Radio Interoperable System

**Uriel C. Fojas
NAPCO Keynote Presentation
December 8, 2022**



About myself

- 13 years with Public Safety Communications
 - Extensive analyses, design, and implementation lowband VHF duplexers, combiners, and multiplexers for CHP
 - Engineering and implementation 700/800 MHz votescan systems for Caltrans
 - Promoted to unit head of Various Agencies Unit in 2016
 - Selected as unit head of CRIS Unit in 2018
- 12 years in the private sector designing and developing high-frequency network analyzers
 - Awarded 3 U.S. patents
 - 7,095,294 B2 Directional Bridge Coupler (300kHz-20GHz)
 - 2007/0252660 A1 Single-Substrate Planar Directional Bridge
 - 7,518,463 B2 Circuit Assembly with Conical Inductor



CRIS Overview

- **What:** Statewide, P25-based, trunked radio system designed and built for first responders and public safety users in the State of California.
- **Why:** To improve interoperable communications among public safety agencies and departments and leverage economies of scale while providing radio coverage to at least 90% of the State's population and 60% of the State's geographic footprint.
- **When:** 5-year BCP awarded in 2019. Project officially started on July 1, 2019.

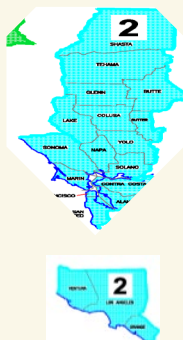


Phased Deployment Approach

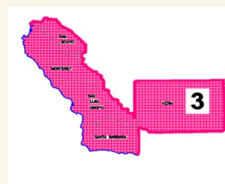
Phase 1:
Completed



**Phase 2: ~90%
Complete**



**Phase 3: ~80%
Complete**



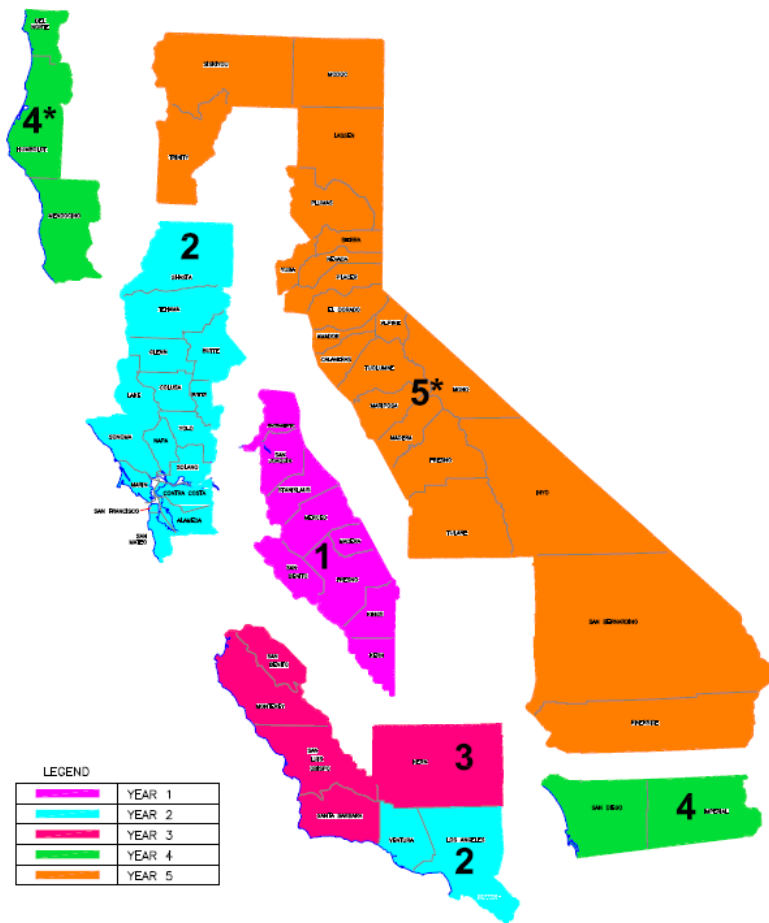
Phase 4:
In progress



Phase 5:
Mono County pilot VHF early
deployment

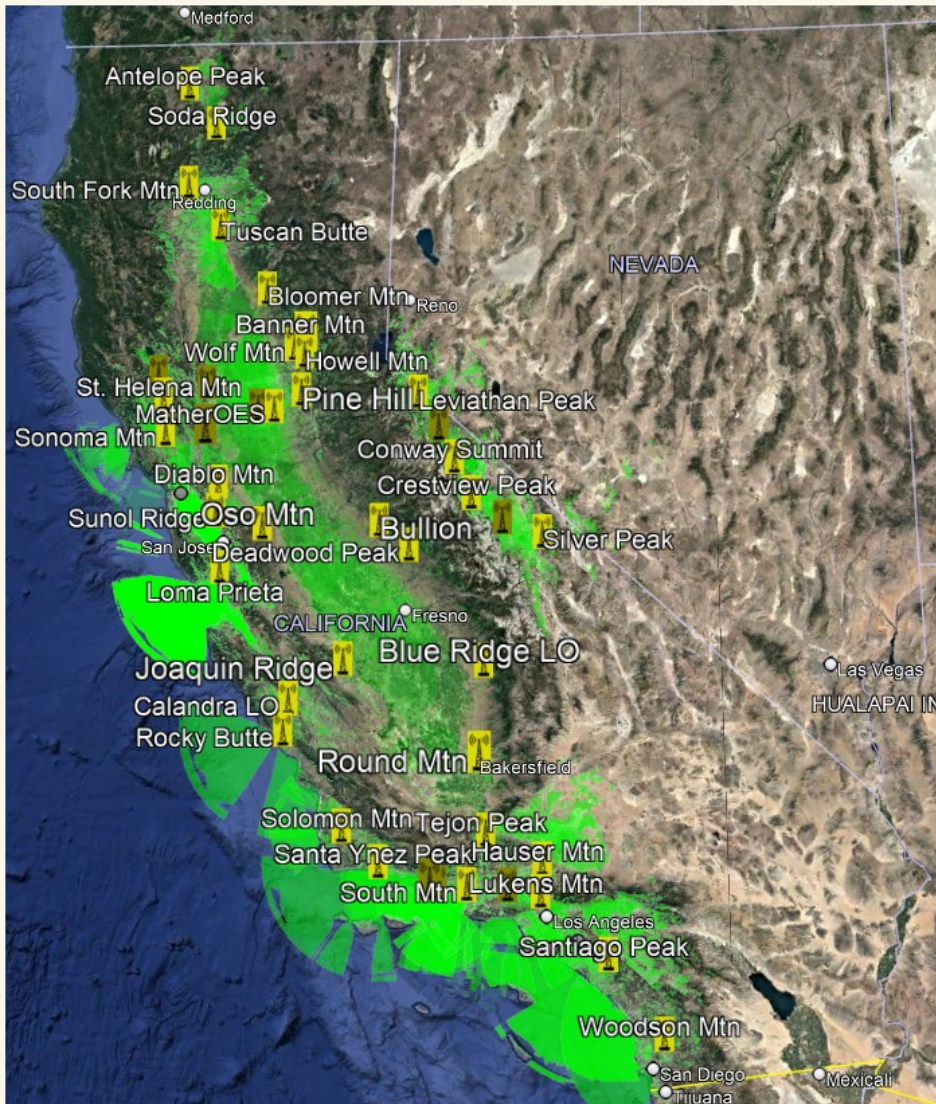


STATE OF CALIFORNIA
CALIFORNIA GOVERNOR'S OFFICE OF EMERGENCY SERVICES
CALIFORNIA RADIO INTEROPERABILITY SYSTEM
DEPLOYMENT MAP





CRIS Predicted Talk-out Coverage To Date



- 43 trunking repeater sites installed and in wide-area trunking
- (37) 700 MHz repeater sites
- (6) pilot VHF high band repeater sites in Mono County



CRIS Subscriber Count to Date

- Agencies/Departments: 18
- Radios: 8,754
- Talk Groups: 717 (551 Primary and 166 Interop)



Office of Governor
GAVIN NEWSOM



CAL VET
California Department
of Veterans Affairs



Department of
Cannabis Control
CALIFORNIA



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STATE OF CALIFORNIA
Franchise Tax Board



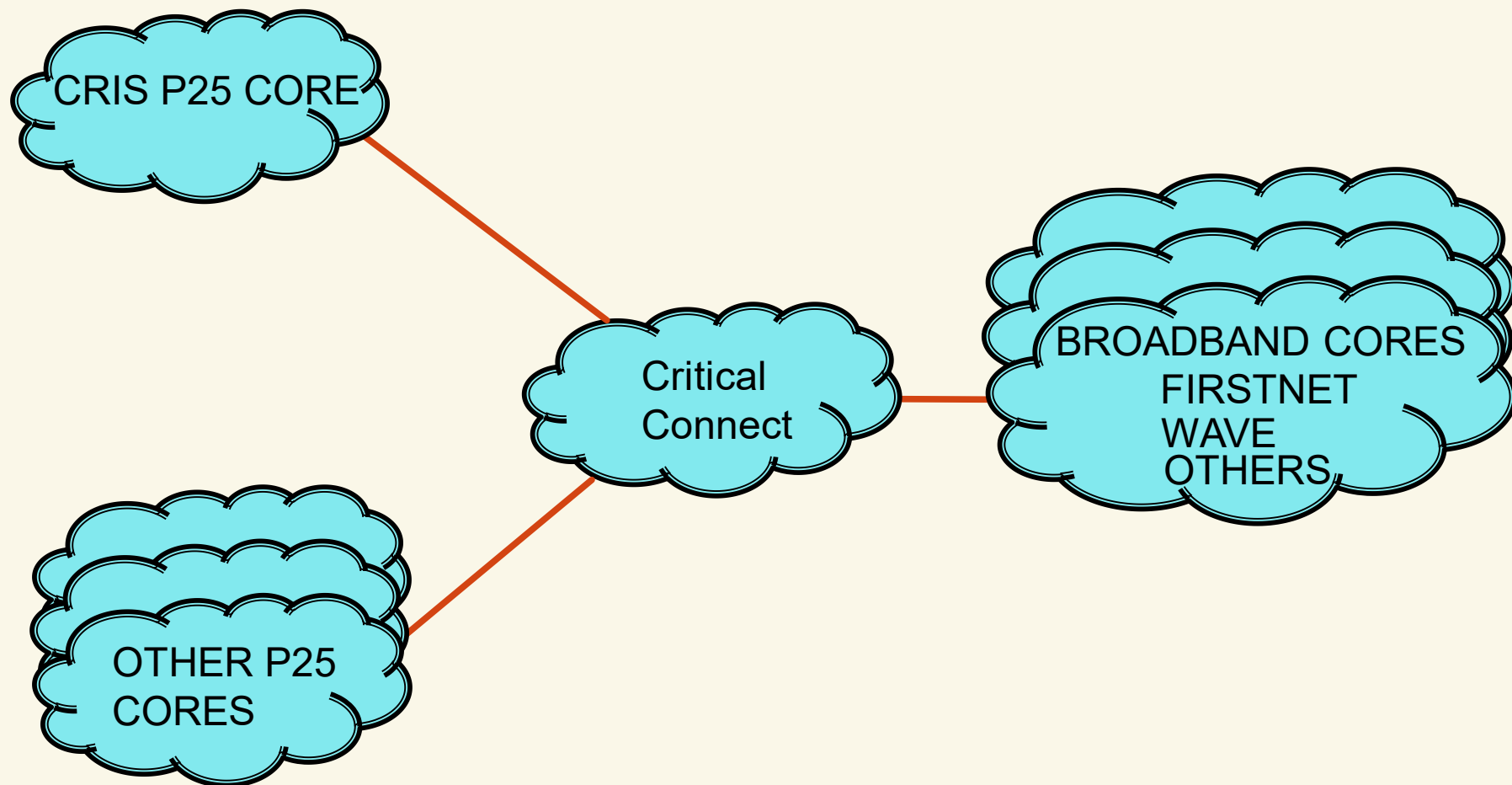


Emerging Technologies in CRIS

- **Cloud-based Interoperability Platform**
 - **LMR-LMR**
 - **LMR-Broadband**
 - **LMR-Wave**
 - **LMR-FirstNet**
- **Integrated LMR-Broadband Radios**
 - **LMR/LTE/Wi-Fi**

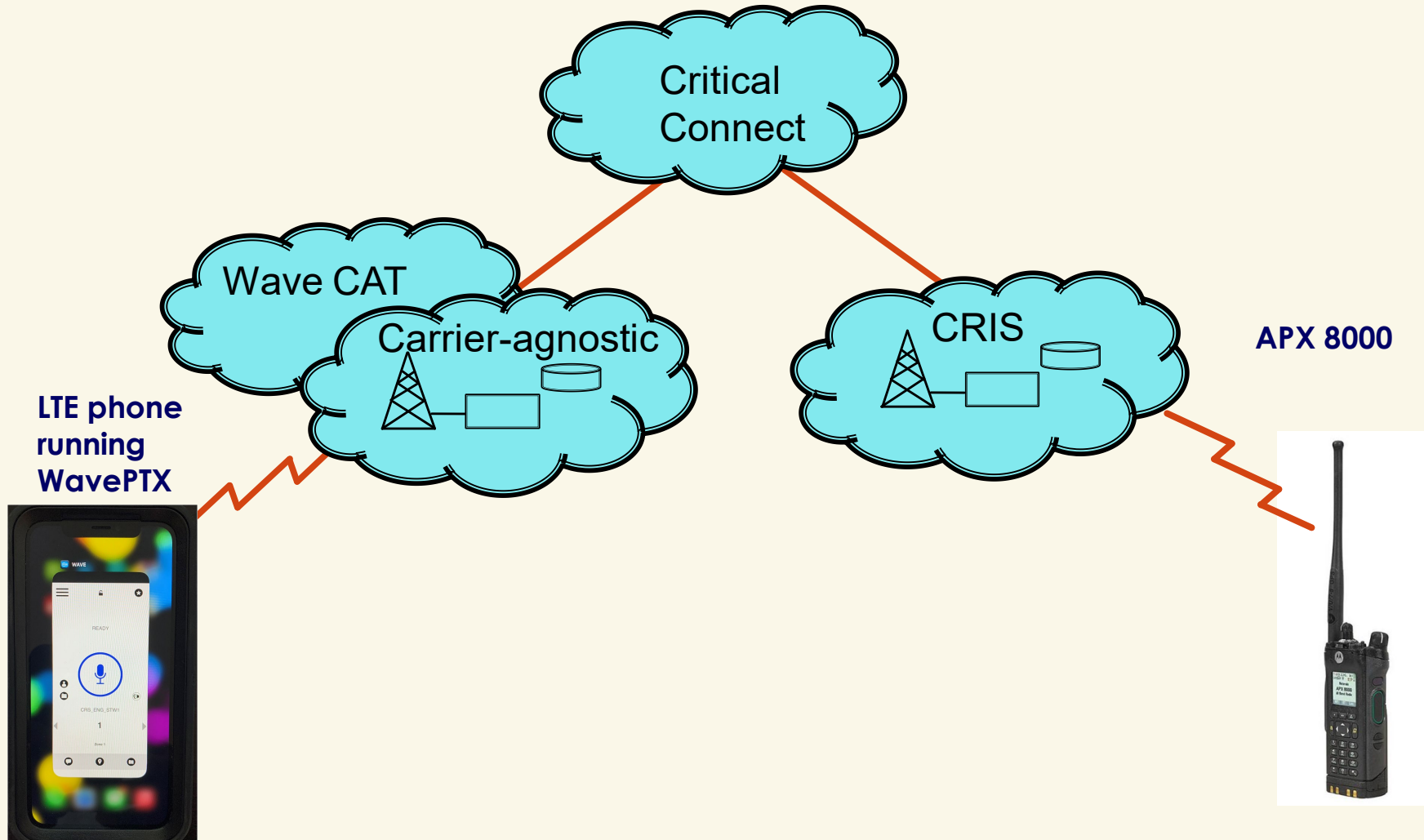


Cloud-based Platform for Interoperable Communications



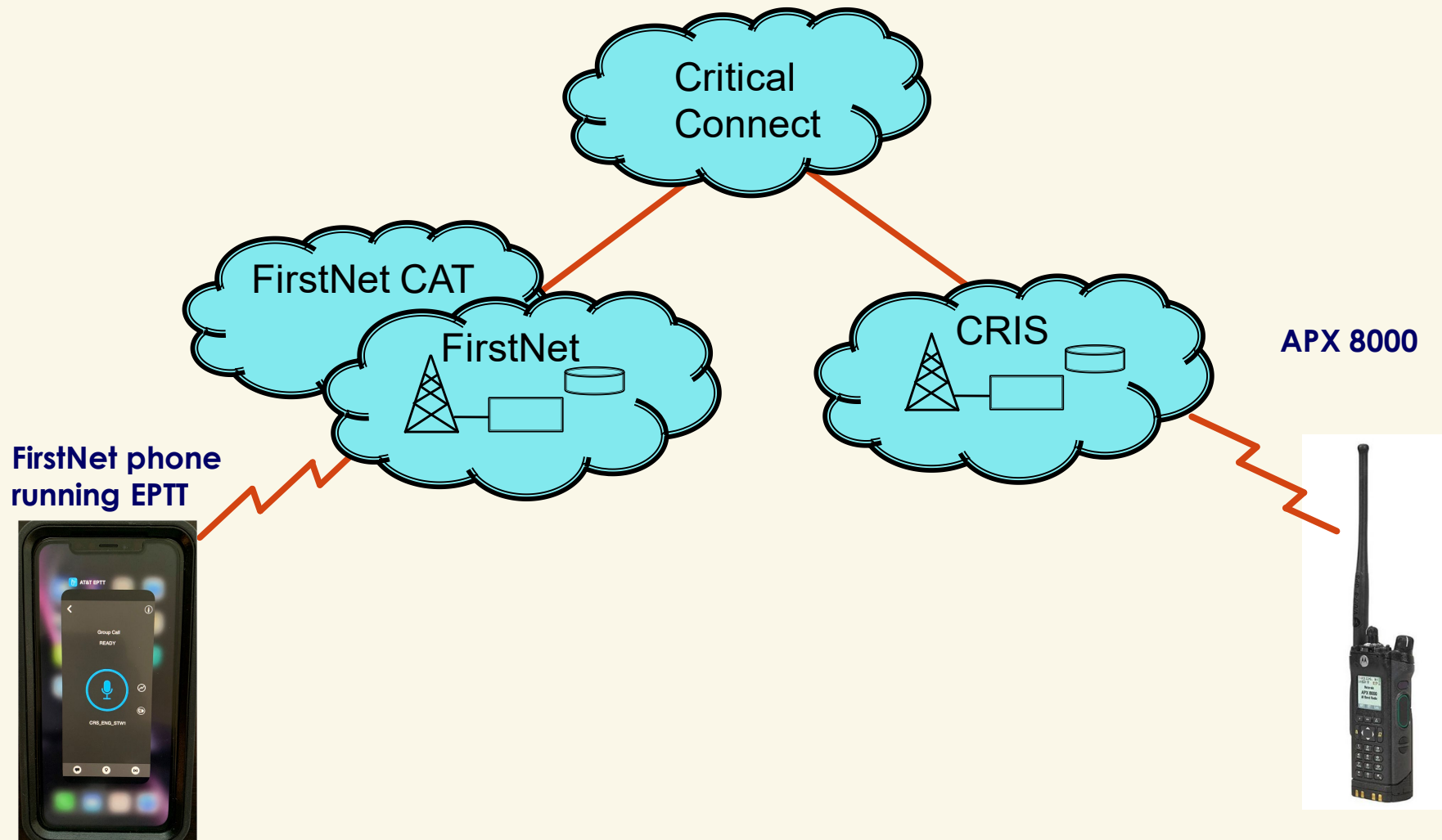


LMR-WavePTX Connectivity & Demo



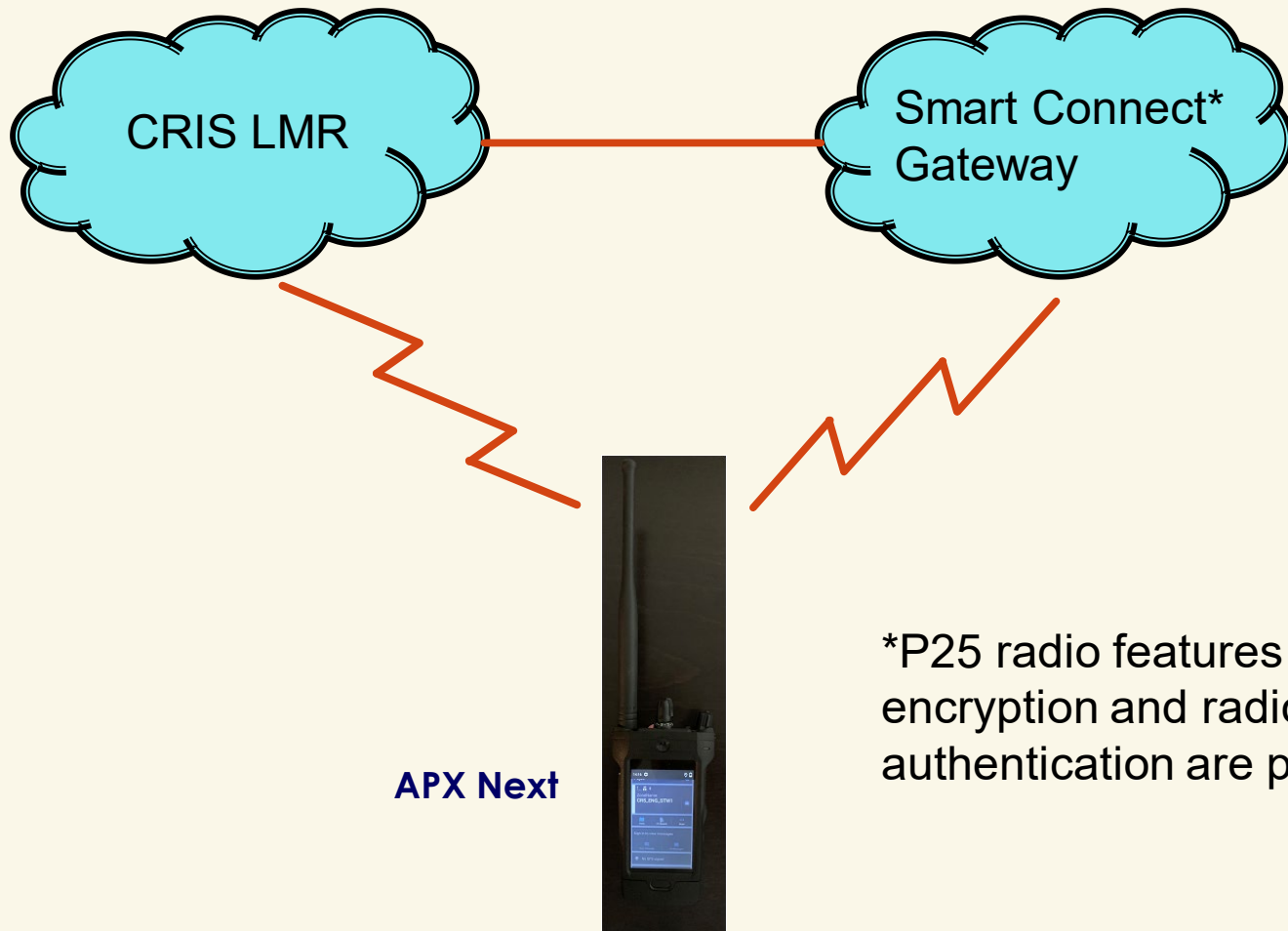


LMR-FirstNet Connectivity & Demo





Hybrid LMR-Broadband Radio with Automatic Switching



*P25 radio features such as encryption and radio authentication are preserved.



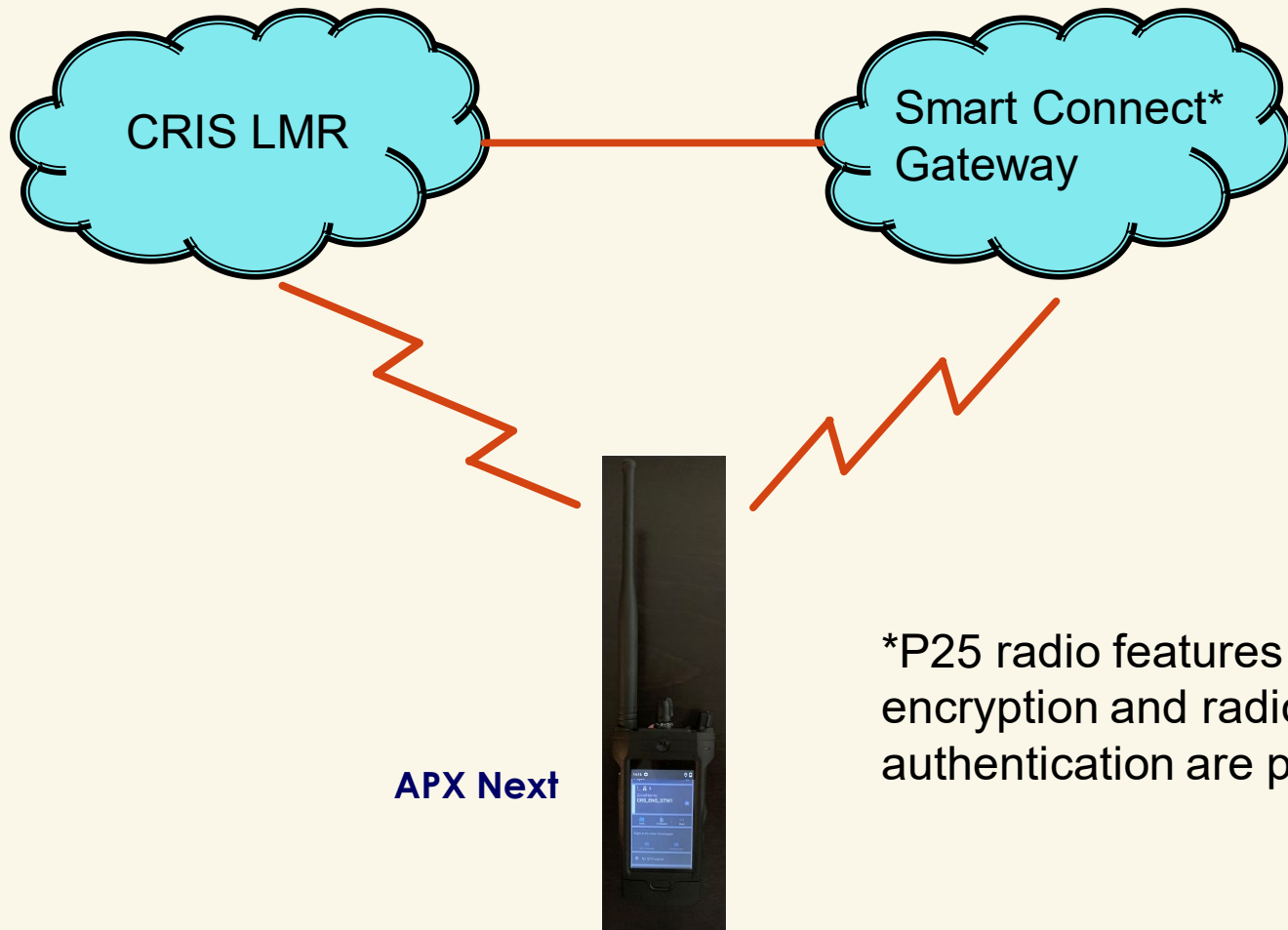
Hybrid LMR/LTE Radio Benefits

- LMR supplemented with LTE Coverage
- SmartConnect integration with CRIS core allows automatic switching
- Feedback from DHCS:

*This week in Bakersfield we ended up encountering what we initially thought was an armed 211 in progress unrelated to our objective. Thanks to the CRIS network, we were able to quickly respond and handle the situation... I am confident we would have not been able to reliably communicate using our current handhelds on UHF. **We can't thank you and your team enough and we especially love... the additional LTE coverage it offers...** Currently there is no CRIS signal in my office and my home and many areas around Fresno so having LTE to supplement has been wonderful. The performance is fantastic and the audio is nice and loud... [] was in our headquarters in Sacramento, another investigator was driving in Merced, and I was in my office in Fresno and we all were able to perform radio checks with Bakersfield PD Dispatch using CRIS_SW > LAW1CA!*



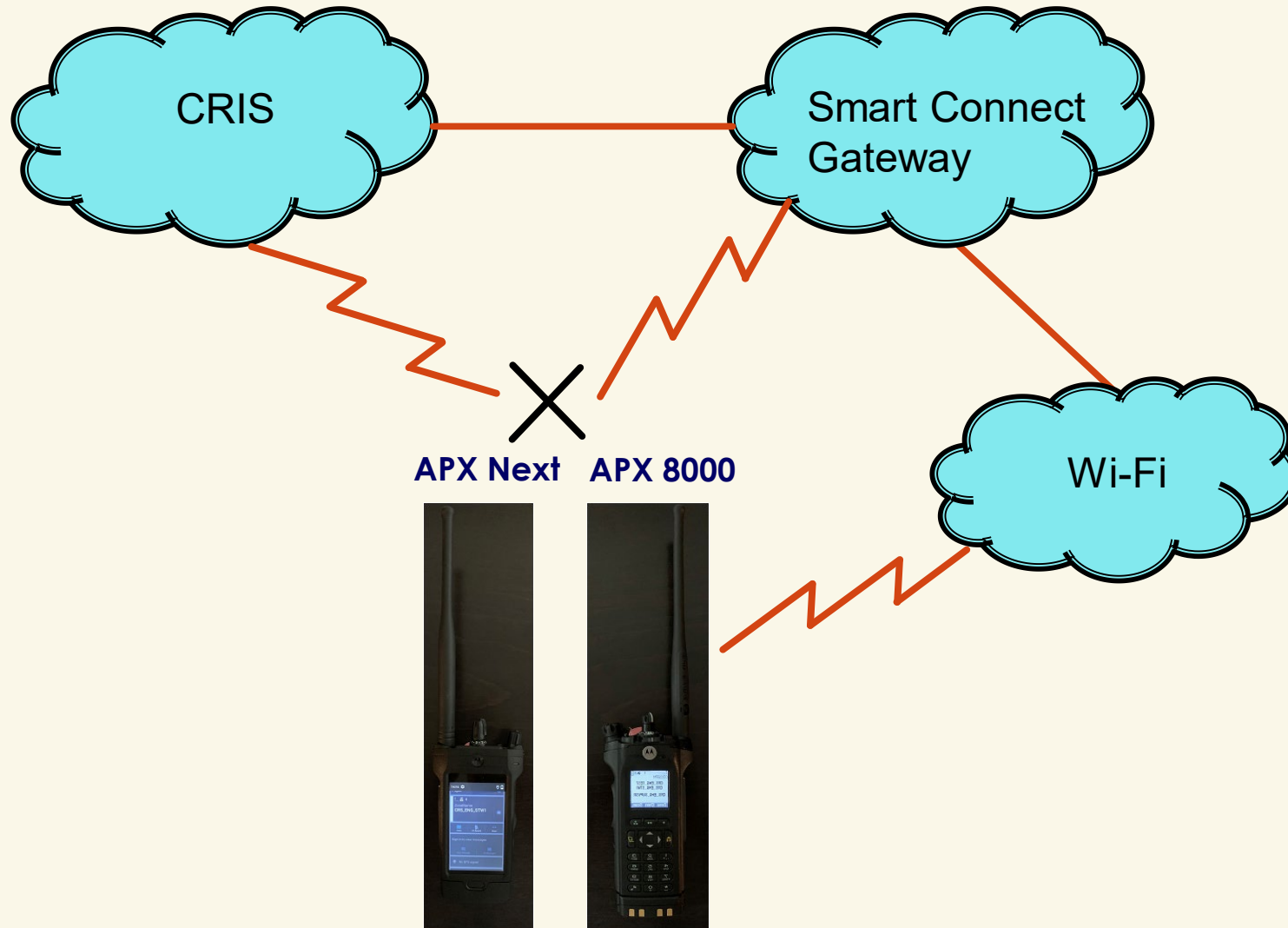
SmartConnect LTE Demo



*P25 radio features such as encryption and radio authentication are preserved.

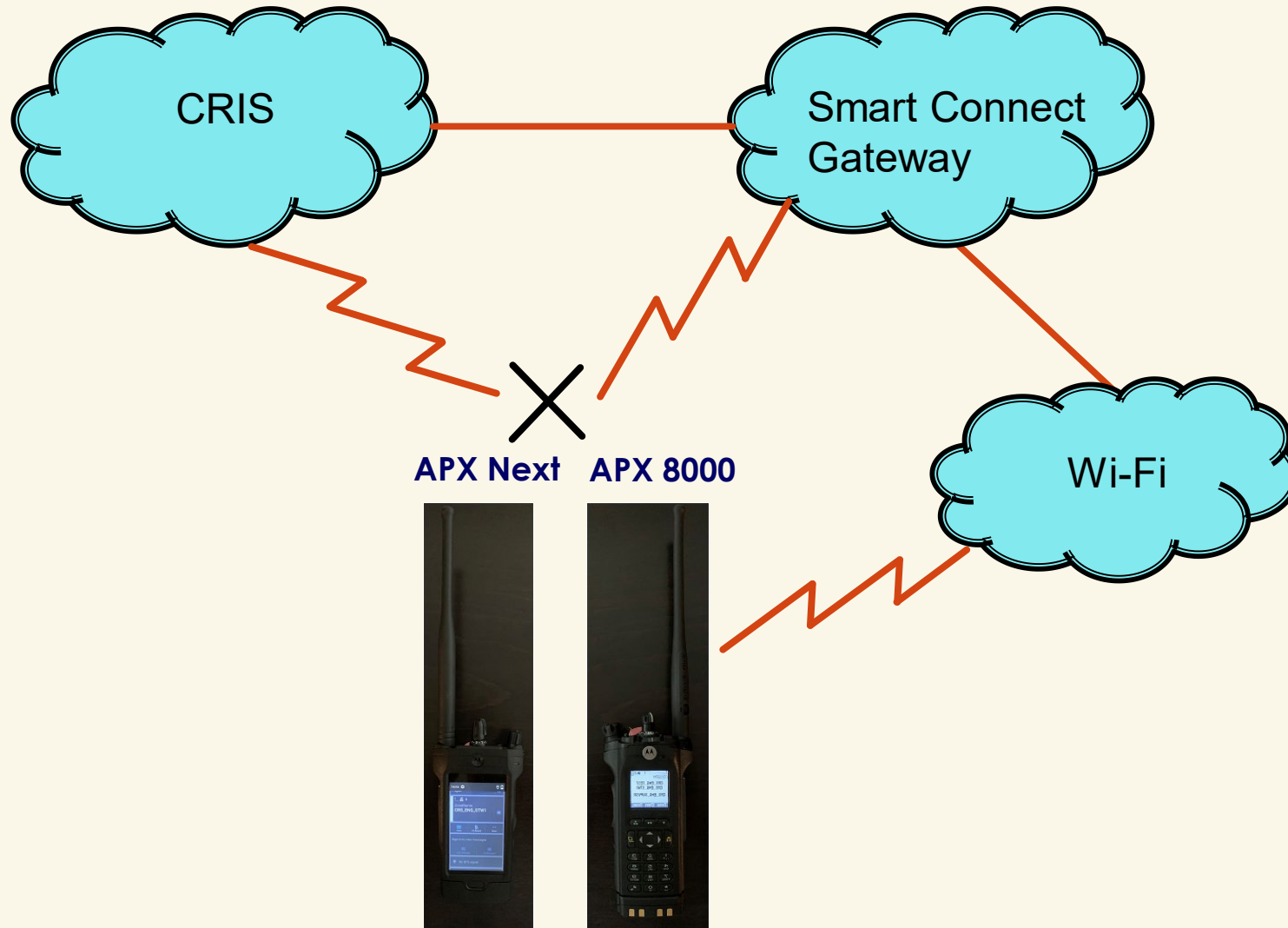


Voice over Wi-Fi





Voice over Wi-Fi Demo





Questions, comments, feedback?



Become a CRIS Subscriber

- www.caloes.ca.gov/CRIS
 - Vision, Mission, Service & Features, Coverage Maps, Forms & Publications
- Minimum Required Forms
 - OES-PSC-115 CRIS Service Request Activate/Deactivate Form
 - OES-PSC-607 CRIS Trunked Radio Service Agreement
 - OES-PSC-606 Talk Group Request Form
- Contacts
 - Steve Yarbrough, Outreach Contact
 - steve.Yarbrough@caloes.ca.gov 916 894- 5105
 - Uriel Fojas, CRIS Engineering Unit
 - uriel.fojas@caloes.ca.gov 916 894-5202



Supplemental Information



WavePTX CAT example screenshot

Browser window showing the WavePTX CAT interface. The address bar displays the URL: `cat.poc01.waveoncloud.com/cat/static/ngcatui/1667533459`.

The page title is "Contact & Talkgroup Management".

The left sidebar contains navigation options:

- PTT Users
- User Profiles
- Group Profile Management
- Talkgroups** (selected)
- External Users
- Integrated Users
- Interop

The main content area displays "Talkgroups" with a count of 14 Talkgroups. It shows a list of talkgroups with the following details:

Name	Talkgroup Type
CRS_ENG_SEC1	Standard
CRS_ENG_SEC2	Standard
CRS_ENG_STW1	Standard
CRS_ENG_STW2	Standard



FirstNet CAT example screenshot

FirstNet - Welcome Corporate Admin Tool

wgp.eptt.kodiaknetworks.com/cat/static/ngcatui/166

Suggested Sites Work

Corporate Admin Tool

Talkgroups 42 Talkgroups

Page 1 of 1 Create Talkgroup

	Name	CRS_ENG_SEC1	Talkgroup Type EPTT Talkgroup
	Name	CRS_ENG_STW1	Talkgroup Type EPTT Talkgroup



CriticalConnect Patch Portal example screenshot

Critical Connect

ugw.gw.kodiakgw.com/ugwu/agency/patch

Suggested Sites Work

Patch User

TALKGROUPS

Select

Search Talkgroup

- BB_CHP_CRS_CCEORG
- BB_CHP_CRS_CVAGLD
- BB_CHP_CRS_STWIO
- BB_CRS_ENG_SEC1
- BB_CRS_ENG_SEC2
- BB_CRS_ENG_STW1

PATCH LIST

Search Patch

CRS_ENG_STW1

- BB_CRS_ENG_STW1
- CRS_ENG_STW1
- EPTT_9991001364628

CRS_ENG_SEC1

- CRS_ENG_SEC1
- BB_CRS_ENG_SEC1
- EPTT_9991001364639