Delivering Targeted Alerts - Advancing the Wireless Emergency Alerts (WEA) 3.0 System

Steve Barclay (Moderator)

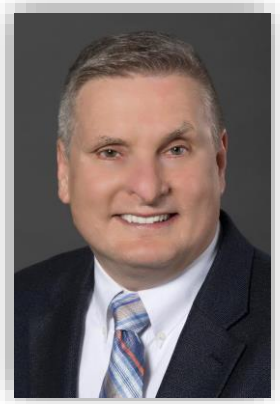
Sr. Director, Global Standards Development

ATIS

June 26, 2019

Advancing ICT Industry Transformation

Speakers



Brian Daly

Assistant Vice President,
Standards & Industry Alliances

AT&T

Terri Brooks

Principal Engineer,
Systems Architecture

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Agenda

- **Webinar Background and Purpose; ATIS Overview**
  - Steve Barclay, ATIS
- **WEA Regulatory Overview**
  - Brian Daly, AT&T
- **WEA 3.0 Capabilities**
  - Terri Brooks, T-Mobile USA
- **Closing Remarks**
  - Brian Daly, AT&T
- **Questions & Answers**
  - Steve Barclay, ATIS

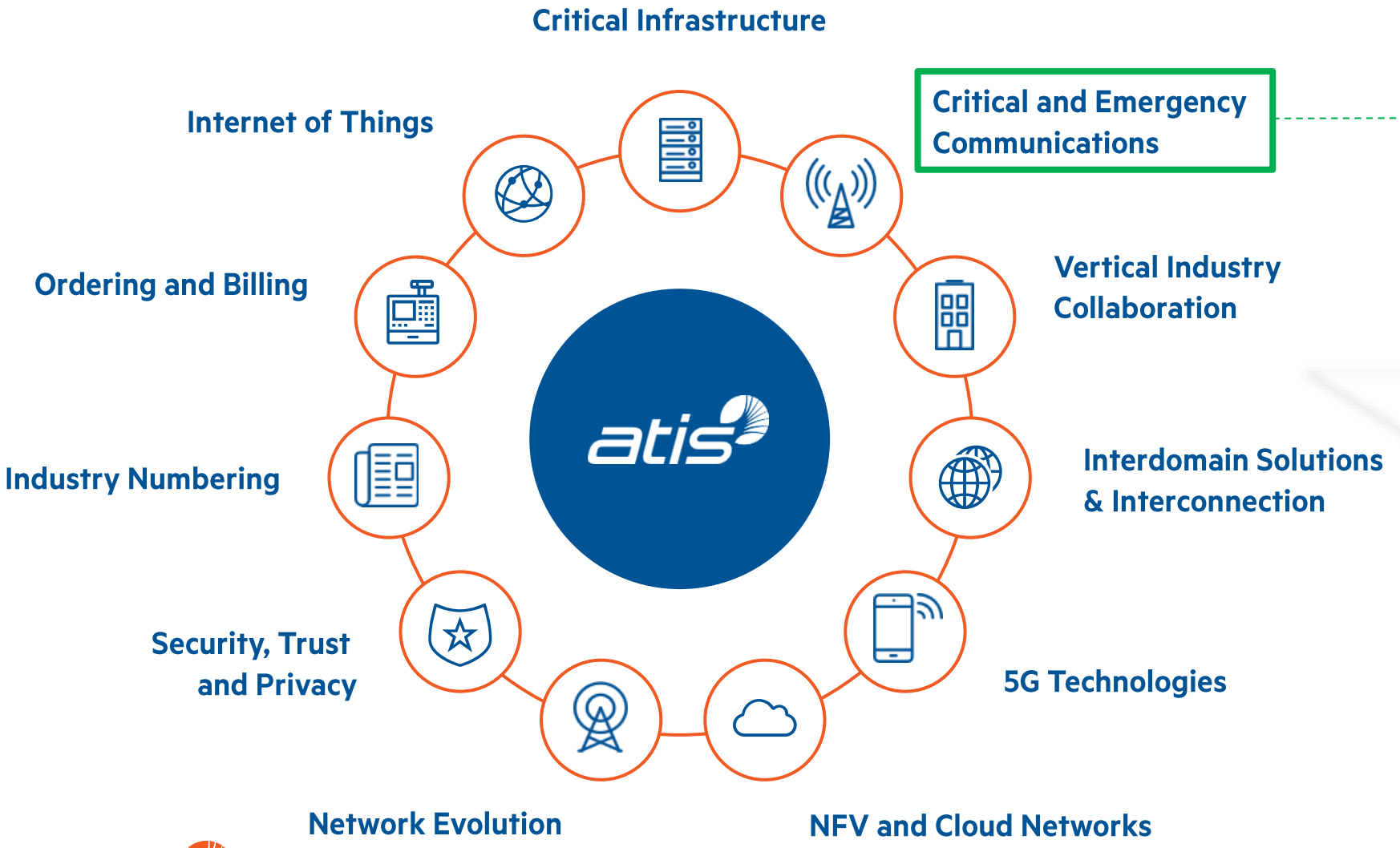
Background and Purpose

- In May 2019, ATIS published the initial four (4) critical Wireless Emergency Alerts (WEA) 3.0 standards in support of the FCC's 2nd Report and Order on WEA.
- The standards address key capabilities, including 24-hour message retention in the device and device-based geo-fencing (DBGF) for enhanced geo-targeting of WEA Alert Messages.
- This webinar provides an overview of the WEA enhancements.

About ATIS

- Broad ecosystem of members addressing the information and communications technology (ICT) industry's top challenges.
- Strategic initiatives and solutions/standards work progresses new business opportunities, solves common industry challenges, and creates a platform for collaboration with other industries.
- Accredited by the American National Standards Institute (ANSI).
- North American Organizational Partner (OP) for the 3rd Generation Partnership Project (3GPP).
  - Provides coordination among 3GPP members to represent regional needs.

ATIS Technology Focus Areas



Work includes Land Mobile Radio/LTE (LMR/LTE) interconnection, location accuracy and test methodologies, Next Generation 911 (NG911), NEAD requirements, and more.

ATIS and WEA

- For well over a decade, ATIS has been engaged in developing the requirements and standards needed to implement a standards-based interoperable WEA service (previously referred to as the Commercial Mobile Alert System).
- ATIS members convert the various FCC WEA regulatory mandates into technical requirements and solutions necessary to implement/enhance a WEA system, including:
  - Standard interface across carriers for the interface between the CMSP Gateway and the Federal Alert Gateway
  - Mobile device behavior specification defining consistency for receipt and display of Alerts
  - Support of Spanish language Alerts and extending the WEA Alert Message to 360 characters
  - Support for international roaming to ensure WEA is compatible globally
  - Etc.
- ATIS members also develop and submit contributions into 3GPP to ensure WEA is part of the global Public Warning System interoperable solution.

WEA Regulatory Overview

Brian Daly

Assistant VP, Standards & Industry Alliances

AT&T

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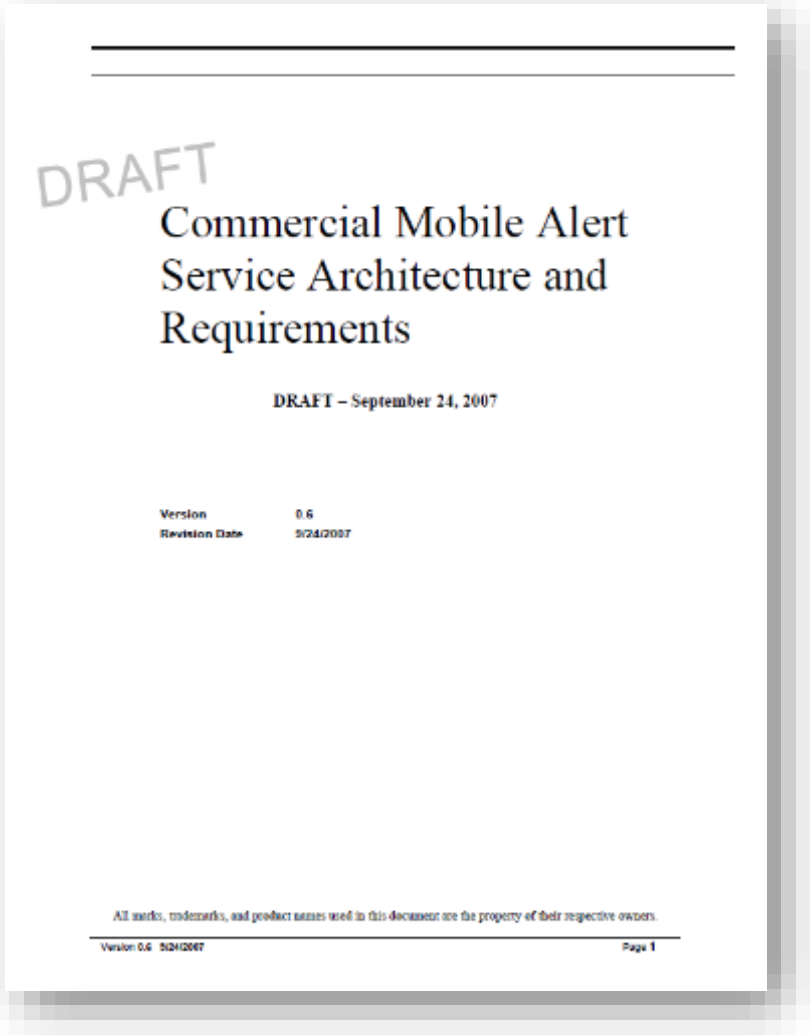
WEA Overview

- WEA is a public/private partnership between the FCC, FEMA and the wireless industry to enhance public safety.
- Warning, Alert, and Response Network (WARN) Act (2006)
  - "Not later than 60 days after October 13, 2006, the chairman of the Federal Communications Commission shall establish an advisory committee, to be known as the Commercial Mobile Service Alert Advisory Committee (CMSAAC)".
  - Establish standards, protocols, procedures, other technical requirements and associated FCC rules necessary to enable Commercial Mobile Service (CMS) providers that voluntarily elect to transmit emergency alerts to subscribers.
  - CMSAAC was composed of representatives from service providers, handset vendors, emergency personnel, individuals with disabilities, and industry groups.
- CMSAAC published its draft report in September 2007.
  - Defining WEA's basic system architecture and establishing technical standards and operating procedures.


DRAFT

Commercial Mobile Alert Service Architecture and Requirements

DRAFT – September 24, 2007

Version 0.6
Revision Date 9/24/2007

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Version 0.6 9/24/2007 Page 1

WEA 1.0

First Report & Order April 2008

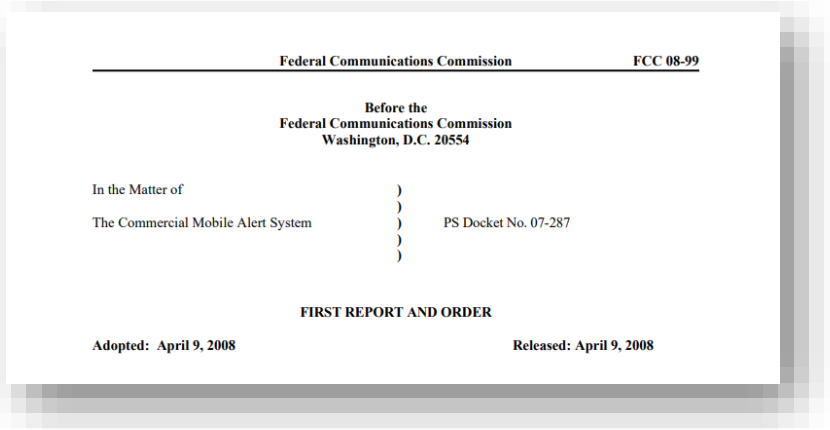
Three classes of Alert Messages:
- Presidential Alert;
- Imminent Threat Alert; and
- Child Abduction Emergency/AMBER Alert

Must not exceed 90 characters of alphanumeric text

Embedded Reference Prohibition

Geographic targeting to an area **not larger** than the provider's approximation of coverage for the Counties or County Equivalents with which that geocode, circle, or polygon intersects

Unique sound and vibration



Federal Communications Commission FCC 08-99

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of)
)
The Commercial Mobile Alert System) PS Docket No. 07-287
)
)

FIRST REPORT AND ORDER

Adopted: April 9, 2008 Released: April 9, 2008

ATIS WEA 1.0 Standards

Standards complete between 2009 and 2011

WEA 2.0

FCC 16-127 September 2016

Increasing Maximum Alert Message Length

- From 90 to 360 Characters

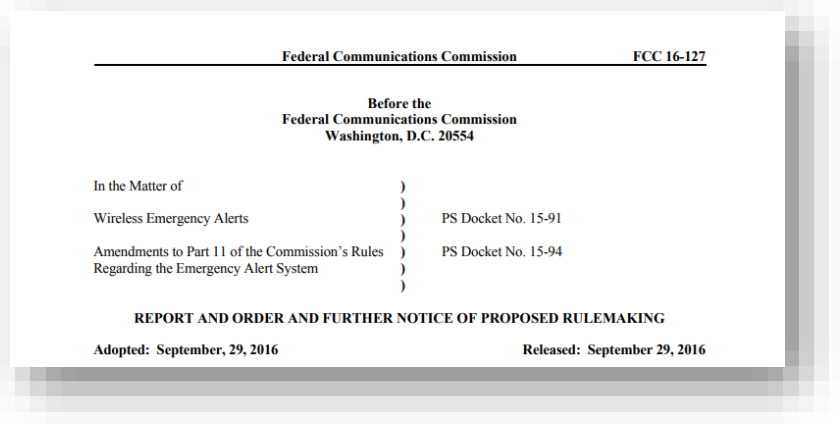
Establishment of a New Alert Message Class

- For Public Safety Messages

Supporting Embedded References and Multimedia

Supporting Spanish-language Alert Messages

Supporting State/Local WEA Testing



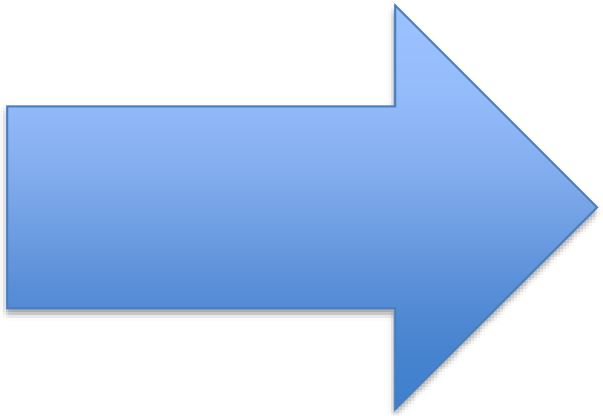
Federal Communications Commission FCC 16-127

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
Wireless Emergency Alerts	)	PS Docket No. 15-91
Amendments to Part 11 of the Commission's Rules Regarding the Emergency Alert System	)	PS Docket No. 15-94

REPORT AND ORDER AND FURTHER NOTICE OF PROPOSED RULEMAKING

Adopted: September, 29, 2016 Released: September 29, 2016



ATIS WEA 2.0 Standards

Standards complete between 2017 and 2018

WEA 3.0

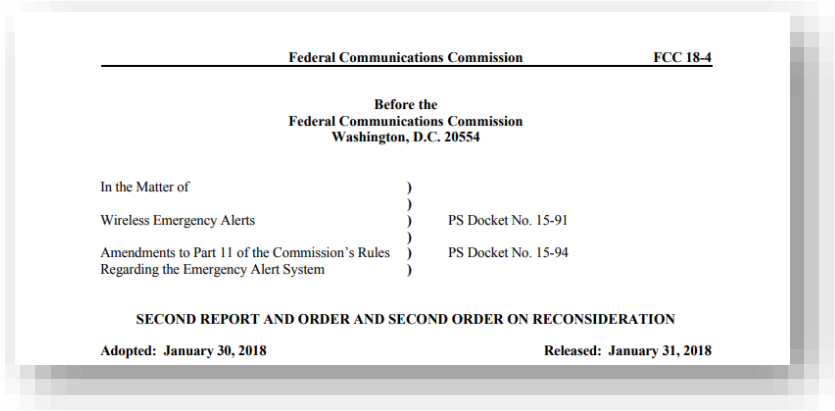
FCC 18-4 January 2018

Narrowing Geo-Targeting Requirements

- Must deliver any Alert Message that is specified by a circle or polygon to an area that matches the specified circle or polygon.
- Considered to have matched the target area when they deliver an Alert Message to 100 percent of the target area with no more than 0.1 of a mile overshoot.
- If network infrastructure is technically incapable of matching the specified target area, then must deliver the Alert Message to an area that best approximates the specified target area on and only on those aspects of its network infrastructure that are incapable of matching the target area.

Alert Message Preservation

- Consumer-accessible format and location for at least 24 hours or until deleted by the subscriber.



Federal Communications Commission FCC 18-4

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of)
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Wireless Emergency Alerts) PS Docket No. 15-91
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Amendments to Part 11 of the Commission's Rules) PS Docket No. 15-94
Regarding the Emergency Alert System)

SECOND REPORT AND ORDER AND SECOND ORDER ON RECONSIDERATION

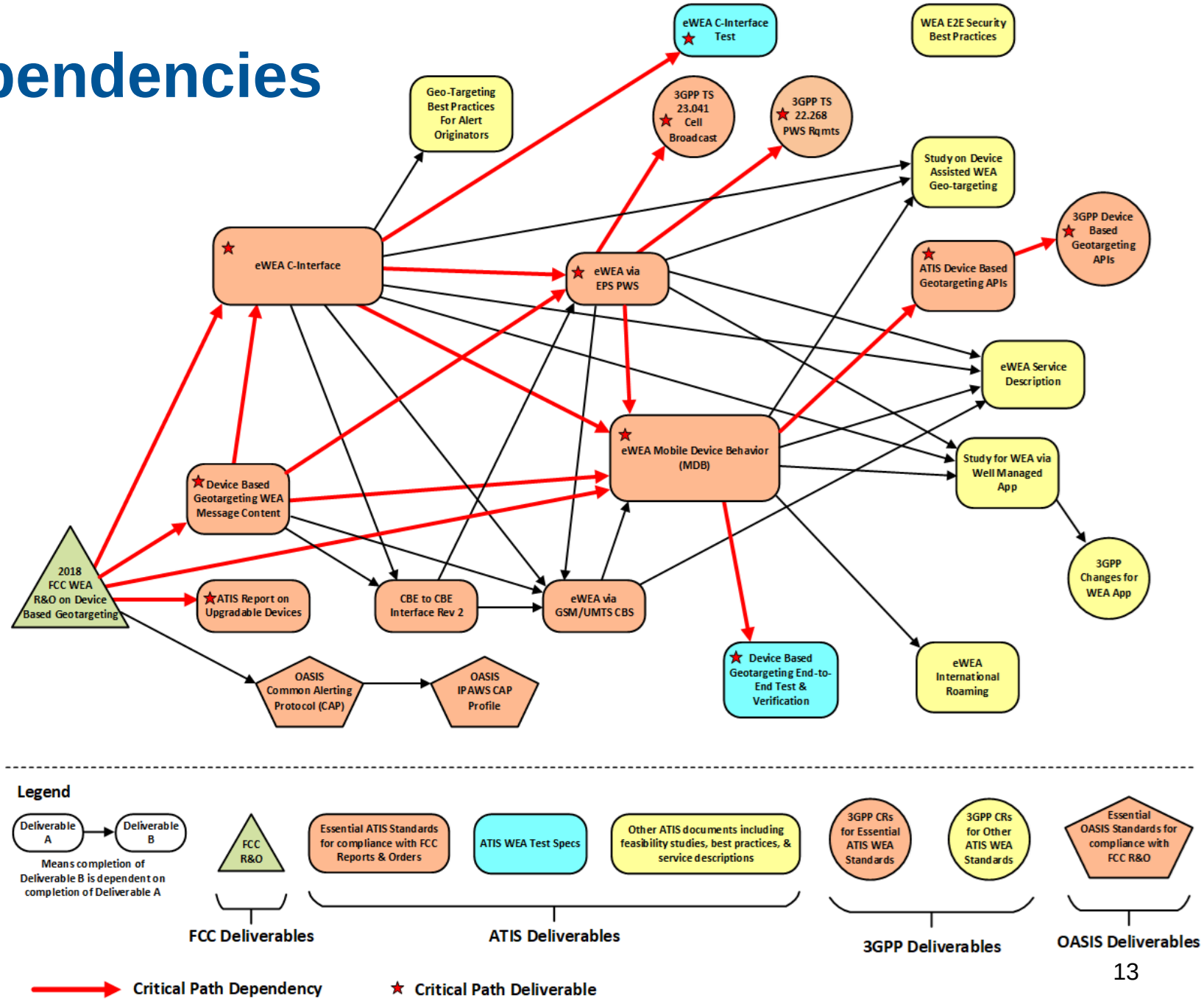
Adopted: January 30, 2018 Released: January 31, 2018

ATIS WEA 3.0 Standards

Essential standards published May 2019
Additional standards in progress

WEA Standards Dependencies

- There are a large number of specifications that need to be created or updated to support WEA enhancements.
- These specifications are required in order to meet the FCC rules, have consistency of operation, support for interoperability, and roaming.

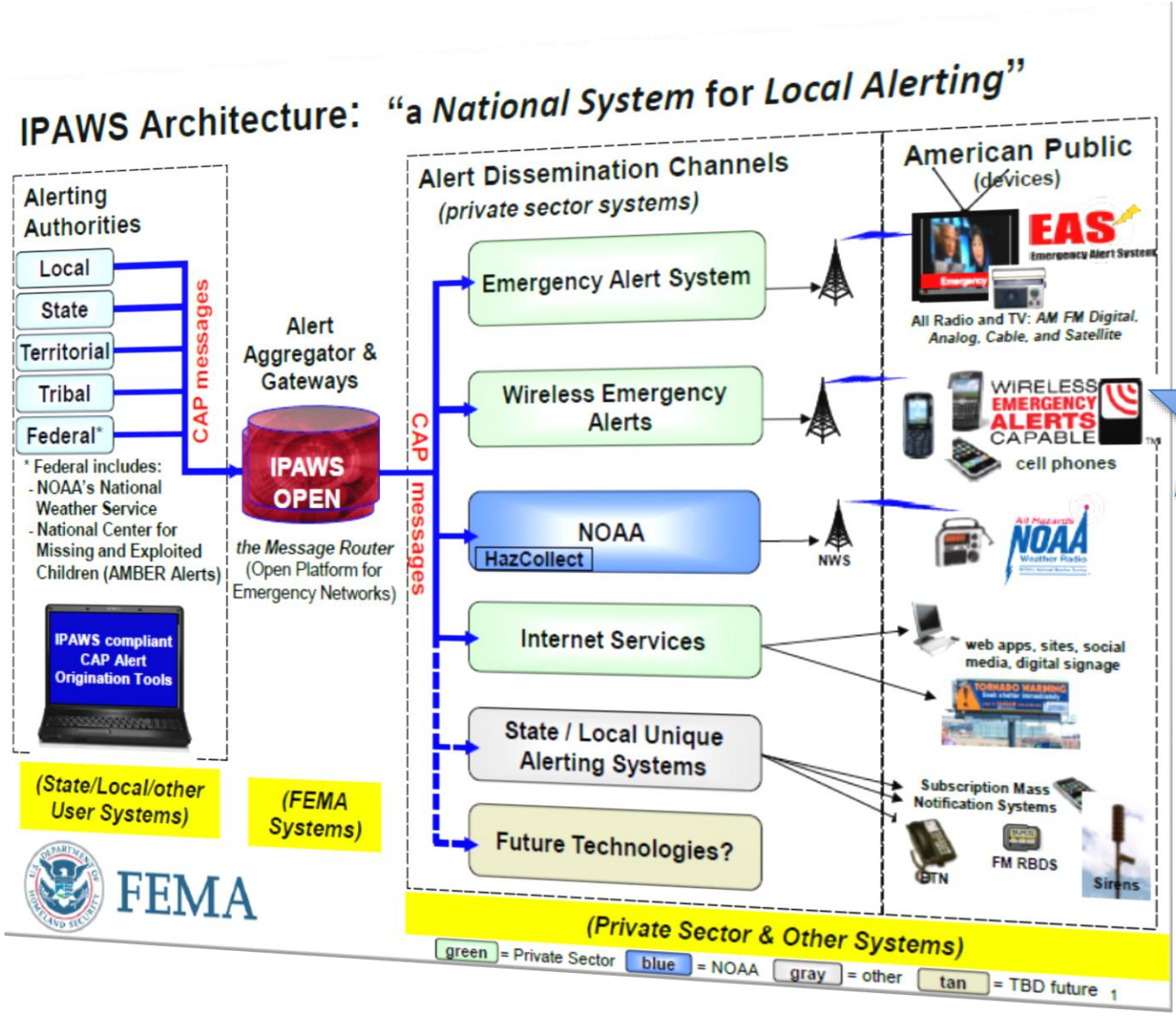


WEA Regulatory Timeline

- WEA 1.0 went live in April 2012
  - NWS began delivering WEA messages on June 28, 2012.
  - All the major cell carriers are participating in WEA on a voluntary basis.
- WEA 2.0 was targeted for May 2019
  - Waiting for FEMA implementation in IPAWS.
- WEA 3.0 November 2019

WEA: A Part of FEMA IPAWS

- Integrated Public Alert and Warning System (IPAWS)
  - A DHS-sponsored program to improve public alert and warning.
  - System of warning systems (includes both current and new systems).
  - DHS led, in coordination with the Federal Communications Commission (FCC), the National Oceanic and Atmospheric Administration (NOAA), and others.



WEA 3.0 Capabilities

Terri Brooks

Principal Engineer, Systems Architecture

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WEA 3.0 Capabilities

Device-Based Geo-Fencing (DBGF) for Geometric Shape, 0.1 mile overshoot

The Mobile Device must be capable of receiving coordinates defining one or more Geometric Shapes (circle, polygon) sent by the Alert Originator, and must be able to compare its location against the Alert Area defined by that shape with the 0.1 mile overshoot allowance taken into consideration.

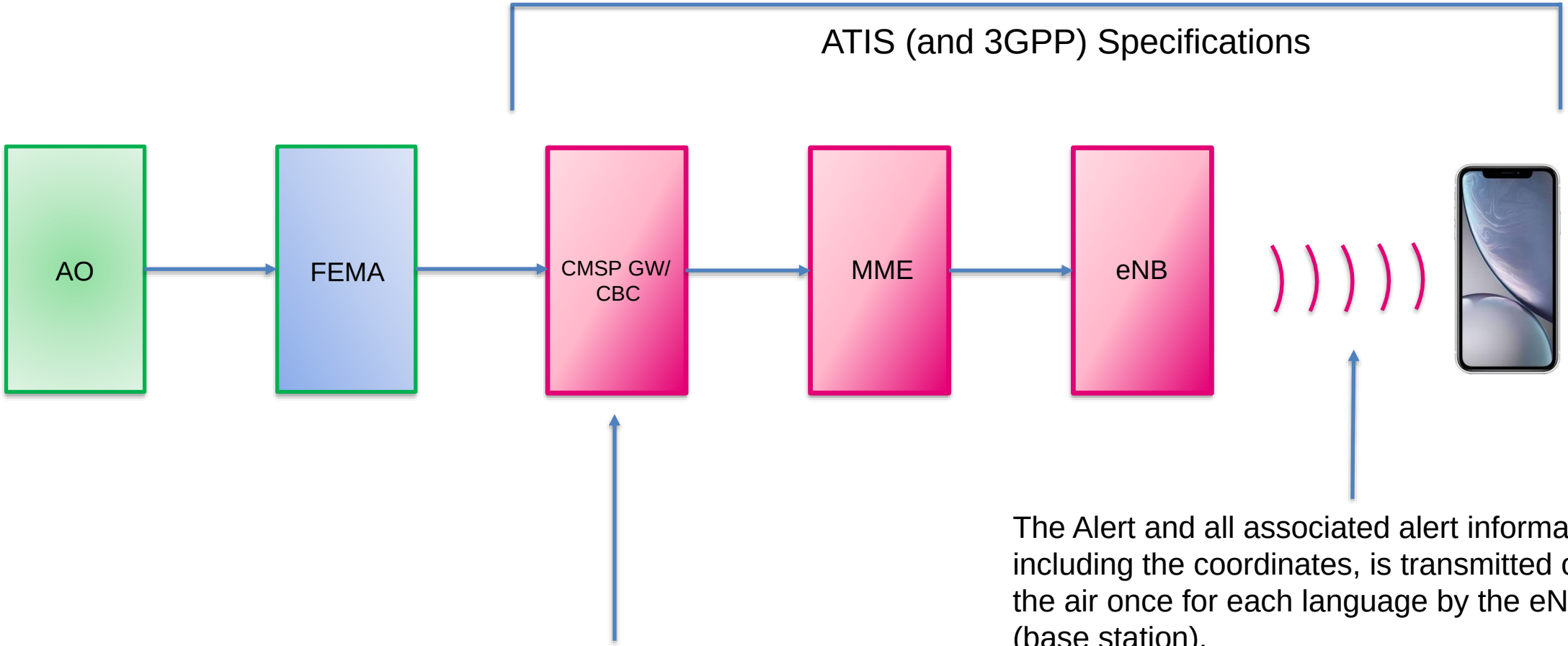
24-hour Retention of Alert

Mobile devices are required to preserve Alert Messages in a consumer accessible format and location for at least 24 hours or until deleted by the user.

Alert Flow from Alert Originator to Mobile Device

- Geometric Shapes (circles/polygons) defining Alert Area
- Network-Based Geo-Targeting and Device-Based Geo-Fencing (DBGF)
- Alert Originator control over DBGF

End-to-End Alert Flow: Alert Originator to Mobile Device



Each Alert received containing multiple languages is reconstructed. One complete Alert per language will be sent to the Mobility Management Entity (MME).

The Alert and all associated alert information, including the coordinates, is transmitted over the air once for each language by the eNB (base station).

Geometric Shapes and Coordinates

Each Alert sent from an Alert Originator is limited to a maximum of ten Geometric Shapes (i.e., circles and polygons), and may contain a total of between 1 and 100 Coordinates for those Geometric Shapes.

Examples: 10 polygons each having 10 vertices,

1 polygon with 100 vertices, or

1 polygon with 85 vertices, 9 circles (1 vertex each)

These limits were set in place to reduce the possibility of broadcast channel overload, especially during a crisis, as well as to reduce latency for Alert presentation.

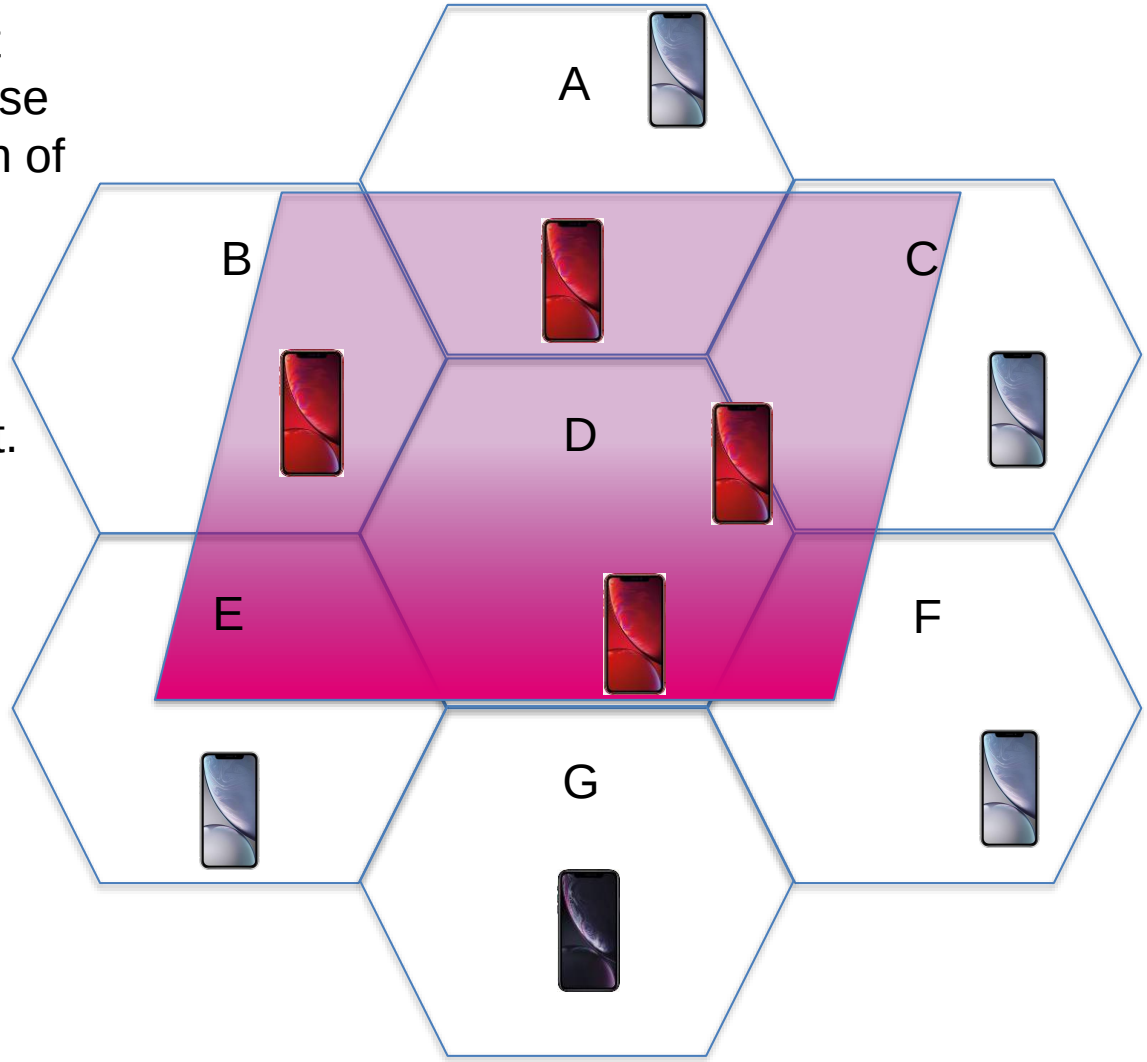
Network-Based Geo-Targeting and Device-Based Geo-Fencing

Cell sites A, B, C, D, E and F will broadcast the Alert for this **Geometric Shape**. All mobile devices in these cell sites will receive the Alert, however, presentation of the Alert will be as follows:

For Network-Based Geo-Targeting *without* DBGF, all **grey** and **red** mobile devices will present the alert.

For Network-Based Geo-Targeting *with* DBGF, only the **red** mobile devices will present the Alert.

The **black** mobile device will not receive the Alert.



Alert Originator Control over DBGF

The FCC R&O indicates that when a Geometric Shape is received, DBGF will occur in the carrier's network.

For certain types of Alerts (e.g., EEWS), latency associated with DBGF could cause a loss of critical seconds in disseminating the Alert. The Alert Originators may want the option to send a Geometric Shape for tight control of the selection of cell sites as with WEA 2.0, but with no DBGF.

ATIS WEA specifications allow for this option by supporting an indicator referred to as the **DBGF Bypass.** If the Alert Originator includes this DBGF Bypass with the Alert, Network-Based Geo-Targeting will be performed without DBGF.

This indicator is not supported in the FCC R&O, and may not be recognized in the carrier's network until FCC clarification is given. Discussions are already in progress with the FCC.

Roving Scenario

- WEA 2.0 Building Block: Alert Presentation Handling
- Roving Scenario and Roving Solution
- Potential Impacts of the Roving Solution

Alert Presentation Handling

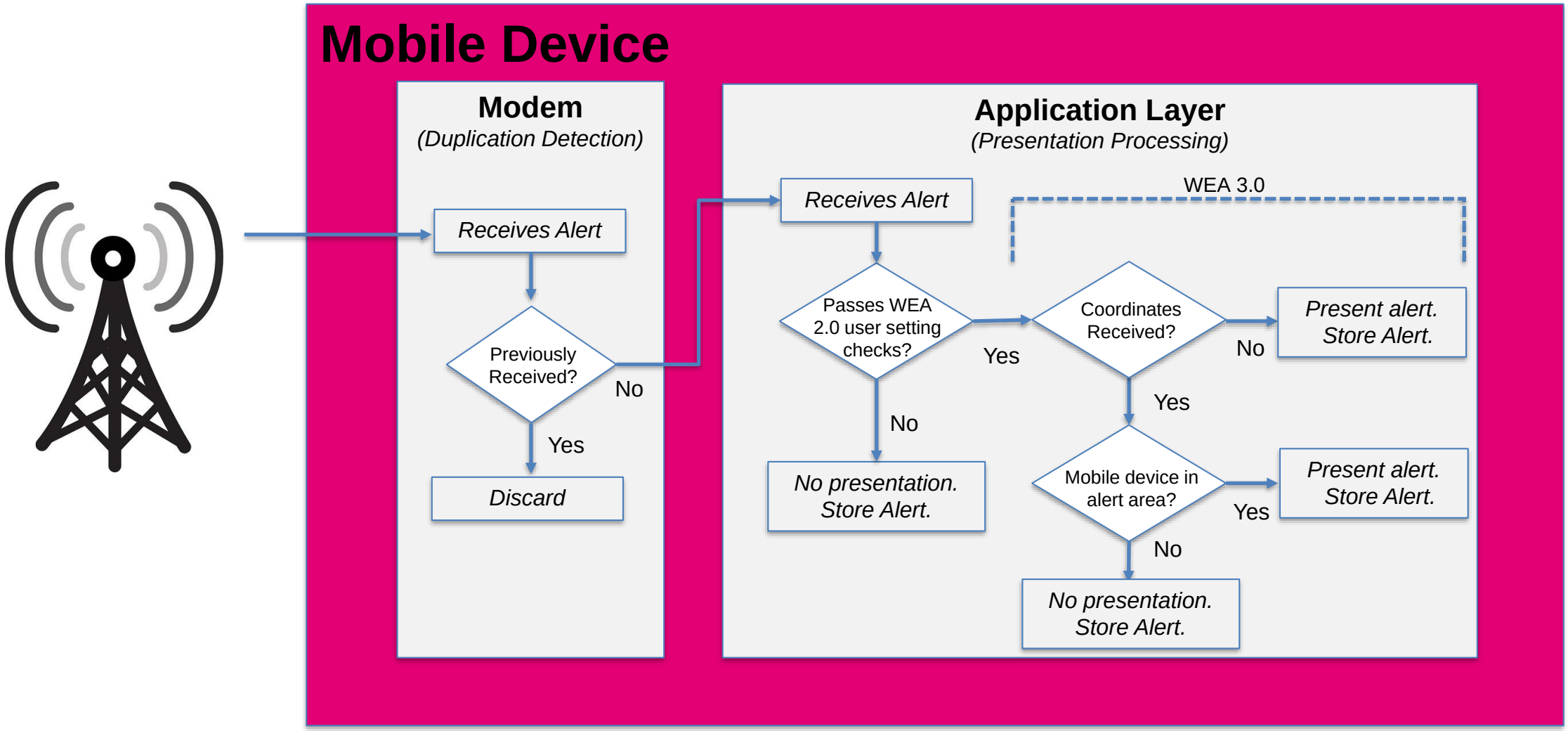
Step 1: Duplication Detection

When an Alert reaches the Mobile Device, the Alert identifiers are first compared to those of previously received Alerts. This functionality prevents presentation of a duplicate Alert (i.e., re-broadcast), as well as protecting the battery power in the Mobile Device by discarding duplicate Alerts without further processing.

Step 2: Presentation Processing

When an Alert is new (i.e., passes Duplication Detection), multiple other checks are performed. The checks performed for WEA 2.0, including user settings (opt-in/opt-out) and language selection, are performed first. If coordinates are received, WEA 3.0 capable mobile devices will then perform DBGF. This means that the mobile device will compare its location against the Geometric Shape specified (taking into account the 0.1 mile overshoot rule), and determine whether to present the Alert. If location information cannot be obtained for comparison, the Mobile Device will default to presenting the Alert. The Alert is then stored for up to 24 hours in the Mobile Device.

Alert Presentation Handling

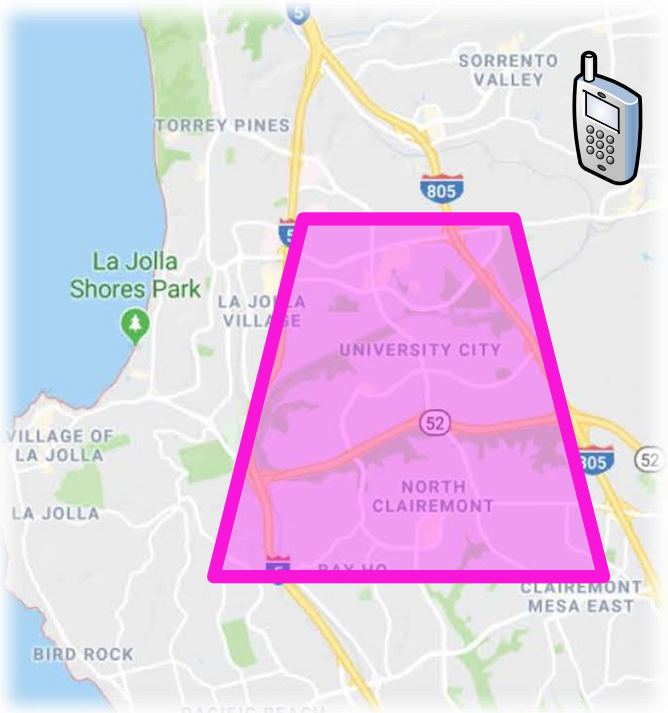


NOTE: If the mobile device's location cannot be obtained for comparison, the default action is to present the Alert.

Roving Scenario and Roving Solution

Roving Scenario (problem statement):

1. Mobile Device receives broadcast outside of polygon and does not present the Alert.
2. Mobile Device moves inside polygon.
3. Mobile Device receives re-broadcast.
4. Duplication Detection discards re-broadcast. No Presentation. Processing occurs even though Mobile Device is now inside the polygon.



Roving Solution:
A solution has been specified which allows the network to direct the Mobile Device to re-process the Alert, specifically checking its current location to see if it has now moved into the Alert Area.

Potential Impacts of the Roving Solution

- Duplication Detection limits the number of times that a single Alert proceeds to Presentation Processing, thereby limiting the associated battery power drain.
- The Roving Solution, which will bypass the Duplication Detection, will incur Presentation Processing each time the network directs the Mobile Device to re-check its location, impacting battery life.
  - The Roving Solution will wake up all Mobile Devices in all cells in which the Alert is being broadcast.
- ATIS will address how to balance the frequency of use of the Roving Solution with the possible negative impacts to the user's battery power.

ATIS WEA 3.0 Standards Completed in May 2019

- *WEA 3.0 via EPS Public Warning System Specification*
- *WEA 3.0 Mobile Device Behavior (MDB) Specification*
- *WEA 3.0 Federal Alert Gateway to CMSP Gateway Interface Specification*
- *WEA 3.0 Device-Based Geo-Fencing*

ATIS WEA 3.0 Standards in Progress

- *WEA 3.0 Operational Characteristics*
- *WEA 3.0 Federal Alert Gateway to CMSP Gateway Interface Test Specification*
- *WEA 3.0 Best Practices for Alert Originators*
- *WEA 3.0 Cell Broadcast Entity (CBE) to Cell Broadcast Center (CBC) Interface Specification, Revision 2*
- *WEA 3.0 via GSM/UMTS Cell Broadcast Service Specification*
- *WEA 3.0 Service Description*
- *WEA 3.0 International Roaming Specification*
- *WEA 3.0 via 5G PWS*

Closing Remarks

Brian Daly

Assistant VP, Standards & Industry Alliances

AT&T

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WEA 3.0 Enhancements Development and Deployment

- Enhancements to WEA are dependent on both network and mobile device deployments.
  - Also FEMA IPAWS and Alert Origination Software support for WEA 3.0.
- WEA 3.0 mobile device deployment will follow normal consumer device lifecycles.
  - Software upgradability to WEA 3.0 in some handsets is still being analyzed by handset OEMs.
- Once deployed in the network, WEA 3.0 enhancements will take time to fully realize.
  - Over time, as new devices with WEA 3.0 capabilities are deployed and upgrades made to existing devices capable of being software upgraded, enhancements will be observable.
- Alert Originator Outreach – WEA 3.0 device dependencies, polygon limits, latency, “roving solution”.
- Consumer Outreach – WEA DBGF is not tracking any device (privacy), possible battery life impacts.

What Makes WEA Successful …

- Public/private partnership with one common goal – enhancing public safety.
- Standards-based solution for consistency across wireless carriers and devices.
- Cell broadcast-based solution available in the majority of handsets without the need to download an “app”.
- Outreach and use of WEA.
  - Consumers
  - Alert Originators

Q&A

Steve Barclay

Sr. Director, Global Standards Development

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Thank you for attending the ATIS WEA 3.0 Webinar

All registered attendees will receive a follow up email containing links to a recording and the slides from this presentation.

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