Federal Communications Commission
Task Force on Optimal PSAP Architecture

Working Group 2:
Optimal Approach to
NG911 Architecture Implementation
by PSAPs

April 29, 2015 Report

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Foundational Task Description

- NG911 has the potential to improve PSAP effectiveness by:
  - Offering more flexible and reliable call routing than legacy 911
  - Improving PSAP situational awareness and response
  - Linking PSAPs to state or regional ESInets that support improved interconnection and consolidation of operations

  However, the large number and diverse legacy architecture of PSAPs in the U.S. has the potential to increase the cost and duration of the transition to NG9-1-1.

Original FCC WG2 Objectives

1. Develop recommendations on how PSAPs can improve 9-1-1 functionality and cost effectiveness through consolidated NG911 network architecture design and operation

2. Develop recommendations as appropriate for: optimal NG9-1-1 network system and network configurations for range of existing PSAP use cases (e.g. large, urban, rural)

3. Develop projected costs and transition periods associated with optimized configuration ensuring and improving access to NG9-1-1 for people with disabilities

4. Update previous best practices for legacy PSAPs identified by CSRIC to address the specific requirements that PSAPs will face in the NG911 environment

Working Group #2 Conference Calls TD

- February 12, 2015 4:00 p.m. to 5:00 p.m. EST
- February 19, 2015 4:00 p.m. to 5:00 p.m. EST
- February 26, 2015 4:00 p.m. to 5:00 p.m. EST
- March 5, 2015 4:00 p.m. to 5:00 p.m. EST
- March 19, 2015 4:00 p.m. to 5:00 p.m. EST
- March 26, 2015 4:00 p.m. to 5:00 p.m. EST
- April 2, 2015 4:00 p.m. to 5:00 p.m. EST
- April 9, 2015 4:00 p.m. to 5:00 p.m. EST
- April16, 2015 4:00 p.m. to 5:00 p.m. EST

  - Supplemented by Subgroup Conference Calls between WG Calls

Where to Start?

- There are around 6,000 PSAPs nationwide

- Most function independently

- Most fundamentally separate in terms of operations

- Most PSAPs have their own equipment that includes:
  - Call taking
  - Logging
  - CAD

- Must consider how to move **OPTIMALLY** to deploy Next Generation 9-1-1 for PSAPs beyond the current independent state

Meaning of Optimal PSAP Architecture

- In this context:
  - "PSAP" is really more of an "emergency services environment" that includes, for example, literal local PSAPs, 9-1-1 Authorities, County/Regional/State Emergency Operations Centers
  - The focus is on the delivery of 9-1-1 calls and their processing (and not the emergency response and incident management)

What is "Optimal" - Defined?

- May include, but is not limited to, a variety of elements:
  - Financial
  - Operational
  - Technical
  - Political
- Focus of group discussion became how all of these components may be factored into the concept of optimal in varying degrees to create a final set of models
- A menu of optimal approaches may ultimately be developed by WG2 based upon a variety of configurations, factors, and circumstances

Some Factors in Defining 'Optimal' PSAP Architecture

- Cost

- Physical versus Virtual configurations

- Geographic interoperability – local, multi-county, state

- Functional interoperability – shared data functions vs local

- Operational effectiveness – normal, local abandoned, disaster

- Data sharing – among PSAPs, among users, etc.

- Resource sharing – GIS data, mapping systems

- Architecture – local traditional to network hosted, etc.

- Geography – local, regional, large scale

- Administration – governance considerations

WG2 Discussion Points

- In the third week of discussion WG2 members elected to develop 'Use Case' subgroups to explore design considerations and how they would affect:
  - Rural PSAPs
  - Urban PSAPs
  - Regional PSAPs
  - Military (later changed to Federal) PSAPs
- A number of questions posed for all Use Case groups to consider included (to name only a few):
  - How to apply/determine accountability?
  - Who owns service delivery and network operations?
 - How we know it's working?

What's Driving NG9-1-1

- New technologies/services:
  - Text, image, video, telematics, sensors, subscriber info, emergency location info
- Need to "mainstream" 9-1-1 technology
- Improve survivability:
  - Network resilience, virtual PSAPs
- Improve interoperability and information sharing
- Standards based:
  - NG9-1-1 conceptualized in 2001
  - NENA began requirements development in 2003
  - Technical development began in 2004
  - i3 architecture continues to develop and includes accessibility technologies

The Nature of NG9-1-1

- Designed to support interoperability
- Designed with open standards
- Designed for and enables open competition
- Enables a transition to competitive service provider environment
- Necessitates regulatory (and legislative) change
- A 9-1-1 calling service and system that performs a number of functions before, during, and after the actual 9-1-1 call
- ESInet transport system – a managed IP network which is not synonymous with NG9-1-1 (dedicated to Public Safety applications not just NG9-1-1)

The NG9-1-1 Eco System
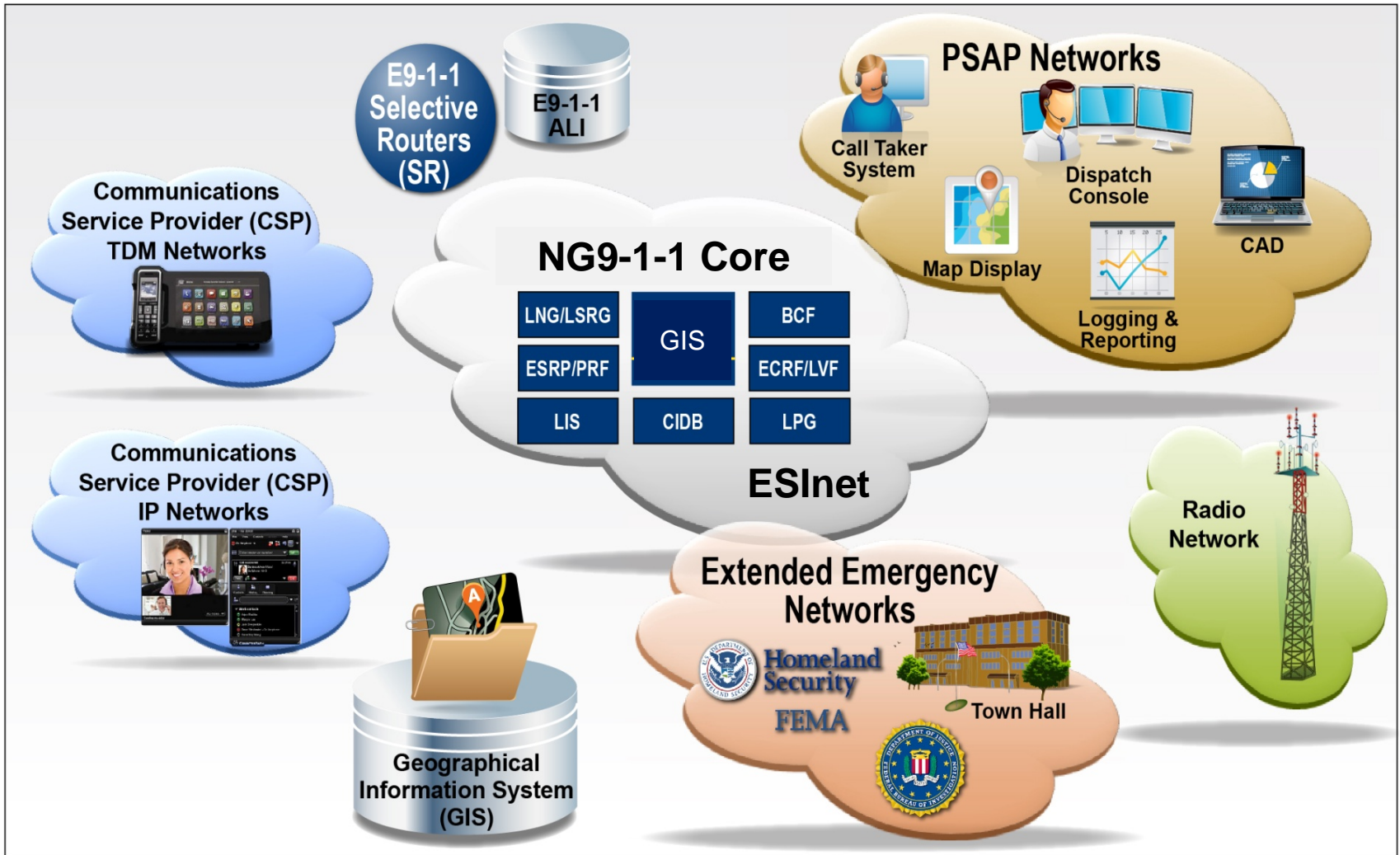
Decision to Develop "Use Cases"

- Optimizing costs (both tangible and intangible)

- Assisting with effective emergency response services

- Practical both regionally and culturally for 9-1-1 authorities

- Consistent with other "Optimal" factors

- End product defines options and considerations:

  - PSAPs or Public Safety Authorities organizing into groups to create ESInet or establishing interoperability between ESInets

  - Options for configurations of ESInets, NG9-1-1 core services central system, and PSAPs, serve as overlays for planning, and allow for functional interoperability

"Use Cases" Types Emerged

- Discussion from the group centered around configuration scenarios

- Decision was to develop "Use Cases" that centered around the original objective in the charge by the FCC for WG2:
  - Large
  - Urban
  - Rural

- Which the group then restructured as:
  - Urban/metropolitan
  - Regional
  - Rural
  - Military (subsequently changed to Federal)

Regional 'Use Case' First Report Out

- Question arose as to how to define "Regional"
  - Is regional a single PSAP that covers a geographical area?
  - Is regional a collection of PSAPs with a primary and other hosted PSAPs?
  - Can multiple hosts be present in a region?
  - What are the operational considerations and impact of these alternatives?
- What is the "regional" IP infrastructure with multiple PSAP connectivity?
- What is the governance model based upon jurisdictions?

Flexibility - Advantage to Regional 9-1-1 Networks

- One or more PSAPs; optional how many to a given region

- Allows for sharing of infrastructure

- Reduction in cost due to sharing

- Function with greater interoperability

- Promotes the value of regional network

- NG9-1-1 functions are the intelligence behind maneuvering calls on a shared network

- Largely a political/governance decision on how many PSAPs are needed to dispatch responders

Following 'Use Case' discussion a change in direction occurred

- Configuration of NG9-1-1 was not based solely upon size of PSAPs or their geographic location

- PSAPs could be arranged in various configurations as long as the NG9-1-1 "Core Services" and other variables of the NG9-1-1 system were identified

- Optimal was determined by a variety of considerations that lent itself to factors such as:
  - Cost
  - Sharing
  - Operational efficiency

Ongoing Conceptual Discussions

- The ESInet must be looked at as the "transport network" and not the whole of NG9-1-1

- Various components become the "core elements" of a NG9-1-1 system

- There are at least four dimensional arrangements to the configurations using the NG9-1-1 core elements in any configuration design:
    1. Access and NG Core Services
    2. Terminating Equipment, Call Taking and Support Systems (CAD, MIS, etc.)
    3. Dispatching Equipment
    4. ESInet

- 'Use Case' groups are now being reorganized into these four Subgroups

Configuration Options

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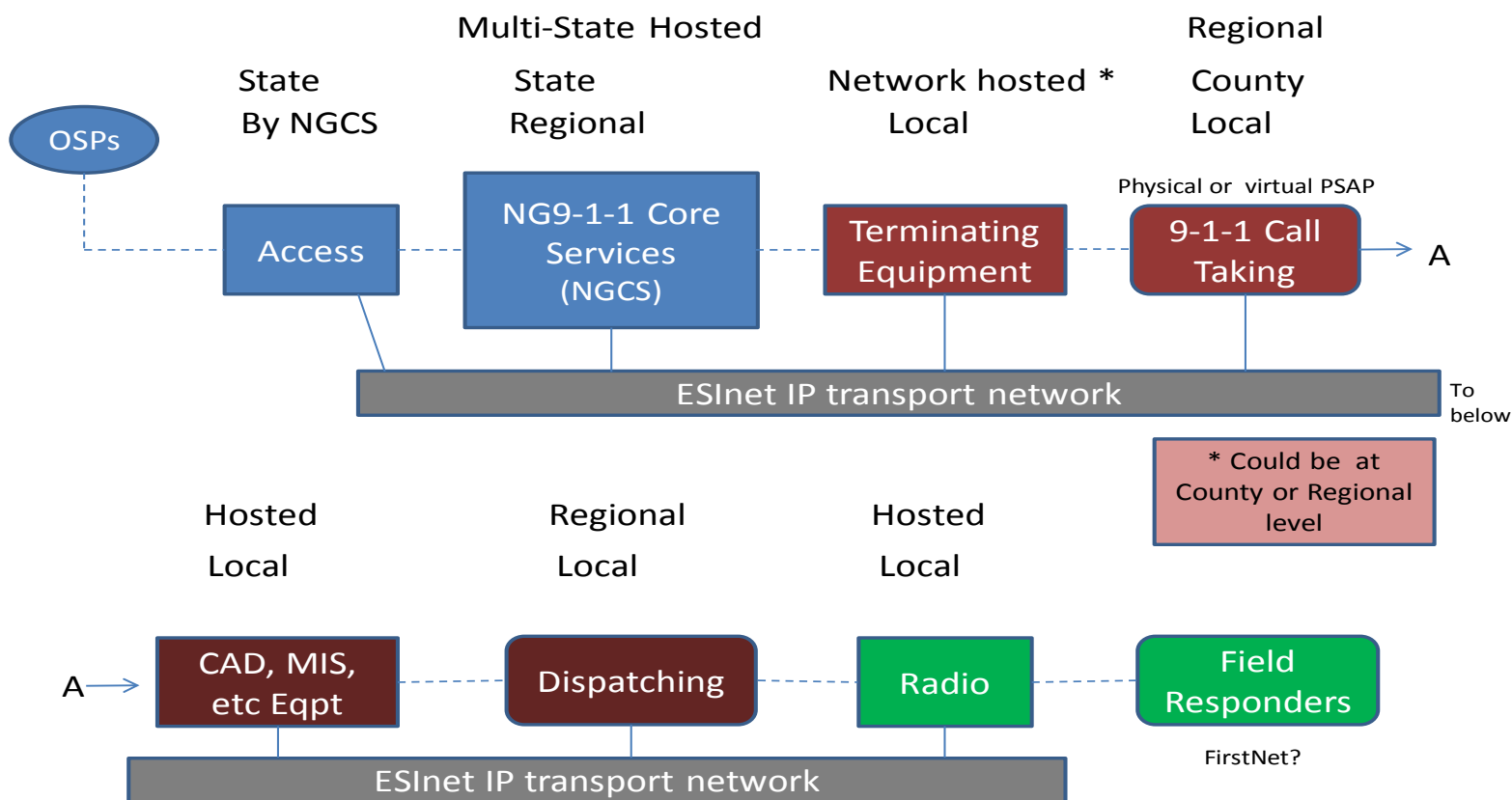
DRAFT Report Organization

- Executive Summary

- Introduction

- Current PSAP Decentralized Environment

- PSAP Optimization Options

- ESInet Implementation

- NG9-1-1 Core Services Implementation

- Optimization Decision Matrix

- Assumptions

- Summary

- Definitions

- Addendum: NG9-1-1 Plan DecisionTemplate

Questions or Comments