NENA Transition to i3 PSAP Standard

Abstract: The intent of this document is to supplement the Dual-Mode PSAP transitional option. It describes inner PSAP transitional applications are evolved to full i3 PSAP compliance without having to upgrade all applications at once.

NENA Transition to i3 PSAP Standard

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1 Executive Overview

Transitioning to full i3 compliance requires proper planning, which starts well in advance and considers budget cycles. The preferred method is to migrate to NG9-1-1 using a fully compliant i3 system, including all of its applications. Doing so ensures a PSAP takes full advantage day 1 of all of the benefits of NG9-1-1, and deliver to the expectations of the community served by the PSAP.

A PSAP transitioning to receiving calls from an NG9-1-1 core network might use a Legacy PSAP Gateway (LPG) as defined in NENA-STA-010 [4]. However, the use of an LPG is discouraged as it leaves the PSAP in an E9-1-1 state for an unspecified period of time.

NENA has published the NG9-1-1 Transition Plan Considerations (NENA-INF-008 [11]), which describe three migration paths, one of which is the Dual-Mode PSAP. This standard elaborates on the Dual-Mode PSAP migration path method to provide a means for Agencies that are unable to upgrade all of their applications to meet a specified E9-1-1 decommissioning date, to implement a minimally functioning solution. While there are no technical reasons why an Agency cannot upgrade applications to be i3-compliant, there may be budget and other considerations that could make it impractical to do so in a specified timeline. In the event an Agency migrating to i3 cannot upgrade all of its application to meet a specified E9-1-1 decommissioning date so they all comply with end-state standards at cutover time, they can follow this standard, with due considerations to the implications in doing so. There are significant issues with this approach such as leaving the PSAP in a mixed E9-1-1 and NG9-1-1 state for an unspecified period of time, and stranding investments in E9-1-1 interfaces. Applications such as Call Handling System (CHS), Computer-Aided Dispatch (CAD) and Logging Recorder may be upgraded individually based on the Agency's migration plan. These upgraded applications are expected to operate with existing legacy E9-1-1 applications during the migration period. CHS-Last and CHS-First upgrade methods are described in this document as Agency considerations for a migration path. This standard describes how transitional applications support both E9-1-1 and NG9-1-1 interfaces simultaneously in order to ensure a controlled transition over time until full migration is complete. This version of the standard only defines how CHS, CAD and Logging Recorder applications support such migration path. Additional transitional applications may be defined in future versions of this standard.

PSAPs that no longer receive calls from the E9-1-1 core network are expected to be fully i3-compliant end-to-end at that time. This standard is not intended to encourage Agencies to retain legacy applications for a long period of time. Agencies are encouraged to transition to full i3 compliance at their earliest convenience. There are significant issues when not doing so.

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2.2 Reason for Issue/Reissue

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Document Number	Approval Date	Reason For Issue/Reissue
NENA-STA-049.1-2025	December 12, 2025	Initial Document

3 Introduction

Recognizing that E9-1-1 is based on legacy telephony technologies that are antiquated, it is a known fact that E9-1-1 is reaching its end of life and ought to be replaced across the Americas and around the world with newer technology such as NG9-1-1. PSAPs migrating to NG9-1-1 is not a matter of if but of when.

Transitioning an E9-1-1 PSAP to NG9-1-1 is a daunting task that cannot be taken lightly. Because the underlying technologies of NG9-1-1 are completely different from its E9-1-1 predecessor, NG9-1-1 changes how 9-1-1 emergency calls are initiated, routed, processed and handled. This affects every entity involved in this process, from 9-1-1 Authorities to PSAP Agents. NG9-1-1 calls will come in more rapidly, with more data and, due to advances in location determination technologies, with more precise location information. This is why careful planning years in advance of an upcoming migration is paramount to a successful transition.

PSAP systems vary greatly in size, complexity and technology used. There is no single solution that fits all when considering migrating PSAPs from E9-1-1 to NG9-1-1. For example, a two-seat PSAP with no CAD will have a very different migration path and

timeline than a large PSAP operation of 100+ seats, with a shared PBX, a shared CAD and a CAD-to-CAD interface with another agency.

That said, it should be noted that there is no technical impediment for a PSAP to migrate to NG9-1-1. However, other considerations can affect the ability for a PSAP to migrate timely, such as budget constraints or resource shortage, if not properly planned in advance.

NENA has published numerous documents related to NG9-1-1, which 9-1-1 Authorities and PSAP personnel are strongly encouraged to become familiar with when considering migrating to NG9-1-1.

- NENA-STA-010 – NENA i3 Standard for Next Generation 9-1-1
- NENA-REQ-001 – NG9-1-1 PSAP Requirements Document
- NENA-INF-008 – NG9-1-1 Transition Plan Considerations Information Document
- NENA-STA-023 – NG9-1-1 PSAP and ECC Specifications for the NENA i3 Solution (work in progress)
- NENA-STA-021 – Standard for Emergency Incident Data Object (EIDO)
- NENA-INF-040 – Managing & Monitoring NG9-1-1 Information Document
- NENA-STA-019 – NG9-1-1 Call Processing Metrics Standard
- NENA-STA-004 – NENA Next Generation 9-1-1 United States Civic Location Data Exchange Format (CLDXF-US) Standard
- NENA-STA-029 – NENA Next Generation 9-1-1 (NG9-1-1) Canadian Civic Location Data Exchange Format (CLDXF-CA) Standard (work in progress)
- NENA-STA-006 – NENA Standard for NG9-1-1 GIS Data Model
- NENA-STA-012 – NG9-1-1 Additional Data Standard
- NENA-STA-043 – NENA NG9-1-1 Data Flow Standard
- NENA-INF-028 – NENA Information Document for GIS Data Stewardship for NG9-1-1
- NENA-STA-017 – NENA Changing Role of the Telecommunicator in NG9-1-1
- NENA-STA-024 – Conveyance of Emergency Incident Data Objects (EIDO) between Next Generation (NG9-1-1) Systems and Applications
- NENA-INF-016 – Emergency Services IP Network Design Information Document
- NENA-STA-040 – NENA Security for Next Generation 9-1-1 Standard (NG-SEC)
- NENA 75-502 – Next Generation 9-1-1 Security Audit Checklist Information Document
- NENA-INF-015 – NENA NG9-1-1 Security Information Document
- NENA-INF-021 – NENA Request for Proposal (RFP) Considerations Information Document
- NENA-INF-041 – NENA NG9-1-1 Operational Impacts on the PSAP Information Document
- NENA-REF-010 – NG9-1-1 Go To Handbook
- NENA Recommended NG9-1-1 Public Education Plan for Elected Officials and Decision Makers
- APCO/NENA ANS 2.102.1-2022, Advanced Automatic Crash Notification (AACN) Vehicle Data Set (VEDS)

The above list is not meant to be exhaustive as NENA continues to create new NG9-1-1 related documents and readers are encouraged to visit the standards page on the NENA website (https://www.nena.org/page/standards) for a more complete list of available documents and their most recent versions.

One key decision to make at the outset is whether your existing system and sub-components of it can be upgraded to a full i3-compliant system. Field experience tells that vendors sometimes provide proprietary solutions or otherwise expanded versions of standards. In light of this reality and to avoid unexpected or hidden costs, compatibility and interoperability issues and unmet expectations, PSAPs are encouraged to talk to their existing vendors before making a definitive decision to upgrade existing E9-1-1 applications. In some cases, it may be more cost effective to procure a brand-new system built to be i3-compliant from the ground up. Once a PSAP has determined the capabilities of its existing E9-1-1 system to be upgradable to NG9-1-1 or to a transitional system, the next logical step is to go RFI/RFP to verify if the market has other alternatives to choose from. NENA-INF-021 [6] is a good resource for procurement considerations.

The presence of a Legacy Selective Router Gateway (LSRG) to facilitate the migration is to be considered. In most cases, when the LSRG is present in the serving NG9-1-1 core network, the use of a Dual-Mode PSAP is not required since the PSAP only needs to live on one network; the LSRG takes care of finding on which network the destination PSAP is and to route calls there, be it from legacy originating networks residing on the E9-1-1 core network, or from IP-capable originating networks on the NG9-1-1 core network. A major benefit of the LSRG is that it decouples the migration of originating networks from the migration of PSAPs. Having an LSRG and a Dual-Mode PSAP at the same time in production is increasing the overall costs of migrating to NG9-1-1 for a jurisdiction without any benefit.

There are three main migration options a PSAP can choose from:

1. Procure a full net new i3-compliant system (preferred)
2. Upgrade existing E9-1-1 applications to become transitional applications, supporting both E9-1-1 and NG9-1-1 simultaneously to become Dual-Mode PSAPs (there are caveats with this transition path – see below)
3. Maintain the existing E9-1-1 system and its sub-components and procure a Legacy PSAP Gateway (LPG) to interwork with the NG9-1-1 core network (discouraged)

Option 1 is the only option that ensures that the PSAP will be i3-compliant end-to-end when it migrates to NG9-1-1. It provides the full breath of NG9-1-1 functionalities to its citizens. PSAPs are encouraged to use this option.

Option 2 may leave the PSAP in a E9-1-1 degraded state, depending on how it is deployed. PSAPs are to consider this option sparingly, only if they are constrained by factors they do

not control fully and other more suitable migration options are not possible. See section **Error! Reference source not found.** below.

Option 3 leaves the PSAP in an E9-1-1 state forever when served by a NG9-1-1 core network. PSAPs are discouraged to use this option since it degrades the service to citizens for an unforeseeable time.

3.1 Scope of this Document

The scope of this document is limited to applications within an E9-1-1 PSAPs that could be upgraded to support NG9-1-1 in parallel with E9-1-1. Such application can therefore be considered transitional, falling under the Dual-Mode PSAP transition option defined in NENA-INF-008 [11].

Applications and interfaces within an E9-1-1 PSAPs are defined in NENA-STA-027 [6] whereby NG9-1-1 PSAP applications are defined in NENA-STA-023.1-202X [3]. The overarching scope of this document is the cross-section of these documents.

This initial version is limited to Call Handling, Computer-Aided Dispatch (CAD) and Logger to resolve a few but very common issues encountered during transitions. Future revisions may include additional PSAP applications.

4 Transition Approaches to End State NG9-1-1

NENA-STA-010 – *NENA i3 Standard for Next Generation 9-1-1* [4] defines the NG9-1-1 end state as when there is no longer an E9-1-1 SR and ALI serving a jurisdiction. To ensure this end state can be achieved in a timely manner, NENA-STA-010 defines the LNG so that legacy originating networks, which cannot technically evolve to IP, can interwork with NG9-1-1. It also defines the LPG that fronts a legacy PSAP that did not transition to full NG9-1-1 and thus, could be delaying the full decommissioning of the legacy E9-1-1 SR and ALI. It is emphasized that there is no technical impediment to a PSAP to migrate its system to NG9-1-1. End state is achieved when all calls and associated data are received, routed, processed, logged, transferred and dispatched according to the NG9-1-1 standards.

NENA-INF-008 – *NG9-1-1 Transition Plan Considerations* [11] describes three different transition paths to end state NG9-1-1:

1. Using an LSRG that interworks the legacy E9-1-1 core network and the NG9-1-1 core network. PSAPs are either on the legacy E9-1-1 network or on the NG9-1-1 network but not on both.

   In this scenario, the core NG9-1-1 network is put in place in parallel with the existing core E9-1-1 network, with the LSRG interworking the two. The migration of originating networks and PSAPs is fully decoupled; each entity determines when to transition to NG9-1-1 until a specified decommissioning date for the E9-1-1 core network is attained. Note that in this scenario, PSAPs are either connected to the core E9-1-1 network or to the core NG9-1-1 network; same for originating networks.

PSAPs and originating networks are assumed to do flash cutovers independently to move to the core NG9-1-1 network. Full i3-compliancy end-to-end is attained when all originating networks and PSAPs have migrated.

2. Legacy ONPs using an LNG to deliver legacy E9-1-1 calls to the NG9-1-1 core network.

   In this scenario, the core NG9-1-1 network is in place, the IP-capable originating networks are interconnected to it, and PSAPs have migrated to be i3-PSAPs (or LPGs) and are also connected to their serving ESInet/NGCS, which leaves the legacy originating networks to interwork with an LNG to accomplish the end state for that jurisdiction. Note that PSAPs and originating networks transition are tightly coupled in the scenario, which means that a core network-based coordination is required. PSAPs and originating networks are expected to do a flash cutover to move to the core NG9-1-1 network. Full i3-compliancy end-to-end is attained at cutover time.

3. Dual-mode PSAP whereby the PSAP is connected to both the legacy E9-1-1 core network and on the NG9-1-1 core network simultaneously.

   In this scenario, the core NG9-1-1 core network is put in place in parallel with the existing E9-1-1 core network however, PSAPs operate a system that supports both E9-1-1 and NG9-1-1 interfaces simultaneously. Legacy originating networks continue to deliver calls to the E9-1-1 core network, which are routed to the E9-1-1 interface of the Dual-Mode PSAP while calls from IP-capable networks and legacy originating networks served by an LNG are routed to the NG9-1-1 interface of the Dual-Mode PSAP. Note that in this scenario, PSAP transition is dependent on the originating networks' transition. Full i3-compliancy end-to-end is attained only once PSAPs have implemented a system that supports i3 in all if its sub-components and that there is no longer calls coming on their E9-1-1 interface. While the PSAP will not necessarily have to replace its Dual-Mode system to be in an i3 end state, the E9-1-1 components of it will eventually become stranded. A Dual-Mode PSAP may be costlier than an i3-PSAP system due to the fact that it is two PSAP functions in one.

If budget constraints or lack of appropriate funding is the primary issue, other options are available to 9-1-1 Authorities and PSAPs that may be more costs effective. For example:

- PSAPs within a region could consolidate into one large operation sharing the same PSAP infrastructure while, possibly, maintaining distributed seat locations for call takers, telecommunicators and dispatchers
- Consider a hosted multi-tenant solution in lieu of a customer premises-based system, which may have a lower cost per seat
- Consider outsourcing to a private PSAP operations

This document specifically addresses the Dual-Mode PSAP scenario and describes the internal sub-components of a Dual-Mode PSAP, which are defined herein as transitional applications.

4.1 Transitioning a Dual-Mode PSAP: CHS-First versus CHS-Last

As will be discussed in the following sections, a Dual-Mode PSAP has applications that can support both E9-1-1, NG9-1-1, or both. When supporting both simultaneously, these applications are called "transitional". A PSAP that opted for the Dual-Mode approach to transition to NG9-1-1 has two main options to perform the transition; "CHS-First" that is, from CHS towards other PSAP applications or "CHS-Last", which is from other PSAP applications to CHS. Pros and cons of both options are provided below:

Method	PROs	CONs	Rationale to use this option
CHS-First	•Expedite NG9-1-1 compliancy as seen by the NG9-1-1 core network	•Leaves the PSAP in an E9-1-1 state despite being seen as fully migrated to NG9-1-1 from the NG9-1-1 core network and callers, creating a false sense of security where more data is being delivered with emergency calls but not used to improve and expedite emergency response to a reported incident •Reduced incentive to go beyond the CHS, even after the E9-1-1 network has been decommissioned •Unlike i3, where an end-state is clearly defined (i.e., no more SR and ALI) and getting to that state is publicly visible, there is no way to determine whether a PSAP would be fully or partially transitioned •May not meet eligibility criteria for external funding sources	•The PSAP cannot meet a specified deadline to migrate to NG9-1-1 using other migration options at its disposal

Method	PROs	CONs	Rationale to use this option
		•Leaves the PSAP exposed to liability and legal risks for the duration it operates in a degraded mode	
CHS-Last	•Allows a PSAP to prepare for an eventual migration to NG9-1-1 while maintaining its full E9-1-1 capabilities •Avoids stranded investments in E9-1-1 only applications •Ensures that when only the CHS remains to be upgraded, i3-compliancy will be met end-to-end once the CHS connects to the NG9-1-1 core network •Compatible with the LSRG, if the CHS is upgraded last and at cutover time	•Risks of not having completed the upgrade of all applications by the set date to migrate to NG9-1-1, which leaves the PSAP in the same position as if it has used the Inward method	•Existing E9-1-1 applications are coming to their end-of-life or have outlived their usefulness and need to be replaced prior to a specified or anticipated deadline to migrate to NG9-1-1

5 Dual-Mode PSAP Transitional Applications

As discussed above, there is a number of reasons why a PSAP would need to transition its legacy applications. One is that an application has outlived its usefulness and needs to be replaced. Another is that the core network delivering 9-1-1 calls is being migrated from E9-1-1 to NG9-1-1. When there is a need to procure one or more applications to address this transition, care is to be given to ensure the new application(s) will interwork with the remaining legacy applications while supporting the transition to NG9-1-1.

A PSAP transitioning to receiving calls from a NG9-1-1 core network might elect to use a Legacy PSAP Gateway (LPG) as defined in NENA-STA-010 [4] to do so. Please refer to STA-010 [4] for further details. As discussed above, using an LPG leaves the PSAP served by an NG9-1-1 core network in an E9-1-1 state for an unforeseeable amount of time, which is discouraged unless there is no other options to decommission the aging E9-1-1 core network.

This document describes transitional systems that can be used to facilitate an Agency's transition to full i3 over a limited period of time while keeping some legacy applications. This document is not to be used to justify remaining in a transitional state for an indefinite period of time. Leaving portions of the PSAP system is a legacy state has serious drawbacks including, but not limited to, a degraded incident response (compared to a fully i3-compliant system), a false sense of being served by an i3-compliant system for citizens, with no clean and clear incentive to complete the transition fully within the PSAP.

This document assumes that existing E9-1-1 systems and their sub-components, applications and interfaces adhere to published standards. However, field experience tells that vendors sometimes provide proprietary solutions or otherwise expanded versions of standards. In light of this reality and to avoid unexpected or hidden costs, compatibility and interoperability issues and unmet expectations, PSAPs are encouraged to talk to their existing vendors before making a definitive decision to use a transitional system.

Transitional Applications MUST support the functions and interfaces specified in NENA-STA-023 [3] such as the Service/Agency Locator (both Search by Location and Search by Name), Discrepancy Reporting, state reporting (QueueState, ElementState, ServiceState/SecurityPosture).

A PSAP transitioning to NG9-1-1 MUST consider when and how to introduce NG9-1-1 specific functionalities that do not exist in the legacy world. Examples of these are the Mapping Data Service (MDS), the Presence Server Functional Element (FE), the Media Proxy FE, the Management Console FE, Responder Data Services, the Logging Service, and the Push-to-Talk System Services FE, to name a few. A transitional PSAP will not achieve full NG9-1-1 compliancy without these. In the CHS-first transition approach, where the PSAP "appears" as an NG9-1-1 PSAP to its serving ESInet/NGCS, some of these functions are expected to exist. For example, the Management Console FE specified in NENA-STA-023 [3] supports management functions for the PSAP and implements required mechanisms such as PSAP ServiceState/SecurityPosture, QueueState, Discrepancy Report proxying, Service/Agency Locator queries, and the monitoring of LogEvents. While the Management Console functionalities may not reside in a single transitional application, those that are exposed to the NGCS are expected to be supported within the transitional PSAP.

5.1 Dual-Mode PSAP Transitional Call Handling System

Call Handling is an application concerned with the details of the management of calls. It handles all communication from the caller. It includes the interfaces, devices and applications utilized by the Agents to handle the call.

Assuming an existing Call Handling System supports both NG9-1-1 and E9-1-1 interfaces (i.e., it is already a TCHS, otherwise it would need to be upgraded, if possible) and interoperability testing between the NG9-1-1 core network and the TCHS vendor would

have occurred ahead of time, a conceivable CHS-First transition could be composed of the following phases:

1. Bring in the ESInet connections into to the PSAP
2. Test the NG9-1-1 core network delivery of emergency calls from IP-capable originating networks and legacy originating networks using an LNG (before cutover)
3. Transition 9-1-1 calls from E9-1-1 to i3, dependent on the migration of legacy originating networks, over a period of time where both E9-1-1 and i3 calls are delivered intermixed
4. Eventually decommission the E9-1-1 circuits, once the E9-1-1 core network is no longer required (i.e., no more legacy originating networks deliver calls on the E9-1-1 interface and the SR, ALI and other E9-1-1 components have been decommissioned). At this point, all the E9-1-1 interfaces of the Dual-Mode PSAP transitional applications become stranded.

This conceivable PSAP transition to i3 implies that a transitional call handling solution is able to connect simultaneously to both E9-1-1 and NG9-1-1 core networks and process calls in parallel.

A Transitional Call Handling System (TCHS) is an application that supports both NG9-1-1 and E9-1-1 simultaneously. It could be deemed the call handling embodiment of the Dual-Mode PSAP as specified in the NENA NG9-1-1 Transition Plan Considerations Information Document (NENA-INF-008.2-2013 [11]). Although both the TCHS and the LPG perform i3 to legacy interworking functions, the TCHS differs from an LPG in that it implements both the i3 and legacy interfaces on ingress whereby the LPG implements the i3 interfaces ingress and the legacy interfaces egress. A TCHS supports a mix of i3, transitional and legacy PSAP applications (e.g., CAD, logger) while all PSAP applications behind an LPG are pure legacy only.

MUST implement the following interfaces:

5.1.1 i3 Interfaces

- i3 call and associated data delivery
    - A TCHS MUST implement the interfaces and functions defined in the Call Handling Functional Element section of the NG9 1 1 PSAP and ECC Specifications for the NENA i3 Solution (NENA-STA-023 [3]) which are based on the PSAP Section of the NENA i3 Standard for Next Generation 9-1-1 (NENA-STA-010 [4])
- EIDO interface with CAD
    - A TCHS MUST implement the server side of the Emergency Incident Data Object (EIDO) Subscription interface as specified in NENA-STA-023 [3] which is based on the NENA Standard for the Conveyance of Emergency Incident

Data Objects (EIDOs) between Next Generation (NG9-1-1) Systems and Applications (NENA-STA-024 [5])

- SIPREC interface with loggers
    - A TCHS MUST implement media logging as specified in the Media Logging section of NENA-STA-023 [3] which is based on the Logging Service section of NENA-STA-010 [4]
- LogEvent interface with loggers
    - A TCHS MUST implement event logging as specified in the Call Handling Functional Element section of NENA-STA-023 [3] which is based on the Logging Service section of NENA-STA-010 [4]

5.1.2 Legacy Interfaces

- E9-1-1 call delivery
    - A TCHS MUST implement the E9-1-1 call delivery interface and functions as specified in the Network Interface section of the NENA E9-1-1 PSAP Equipment Standards (NENA-STA-027.3 [6])
    - A TCHS MAY implement the Request For Assistance Interface (RFAI) as specified in the Request for Assistance Interface (RFAI) Specification (ATIS-0500019.2010(R2015) [10])
- Automatic Location Identification
    - A TCHS MUST implement the Automatic Location Identification (ALI) interface and functions as specified in the ALI Database Interfaces section of NENA-STA-027.3 [6]. A TCHS MAY implement this interface over a persistent TCP [9] connection in lieu of a serial interface if supported by the ALI provider, for which the TCHS and the ALI provider MUST agree on which is the client and which is the server, and both the TCHS and the ALI provider MUST enable TCP Keep-Alives if heartbeat messages are not enabled.
    - In jurisdictions where the NENA ALI Query Service Standard, NENA 04-005 [13], is used (for example Canada), a TCHS MUST implement the AQS Service Consumer (AQS-SC) interface.
- Legacy Computer-Aided Dispatch Interface
    - A TCHS MUST implement the Legacy Computer-Aided Dispatch (CAD) Interface and functions as specified in the Computer-Aided Dispatch Interface section of NENA-STA-027.3 [6]. A TCHS MAY implement this interface over a persistent TCP [9] connection in lieu of a serial interface if supported by the CAD, for which the TCHS and the CAD MUST agree on which is the client and which is the server, and both the TCHS and the CAD MUST enable TCP Keep-Alives if heartbeat messages are not enabled.

    - In jurisdictions where the NENA ALI Query Service Standard, NENA 04-005 [13], is used (for example Canada), a TCHS MUST implement the AQS Service Provider (AQS-SP) interface.
- Legacy Voice Recording Interface
    - A TCHS MUST implement a per-position Legacy Dedicated 600-ohm analog recording output along with the Recorder Start Signal Pair interfaces and functions as specified in the Voice Recording Interface section of NENA-STA-027.3 [6].
- Legacy Radio/Telephone Headset Interface
    - A TCHS SHOULD implement a per-position Radio/Telephone Headset Interface as specified in the Radio/Telephone Headset Interface section of NENA-STA-027.3 [6].

5.1.3 Interworking with a Legacy CAD

A PSAP with a legacy CAD system that implements the CAD interface defined in NENA-STA-027.3 [6] would require a TCHS to interwork i3 call data into a legacy CAD interface. In this case, the CAD operates in a legacy mode where NG9-1-1 data may be available. A TCHS MUST interwork 9-1-1 call data received from an i3 network to a Legacy CAD as follows:

The TCHS MUST compose an ALI record using the procedures in STA-010.3 Section 6.2.3 [4]. Specifically:

1. The ANI supplied in the ALI is composed from the call back information supplied in the original call. A pANI may be supplied if actual call back information was not delivered to TCHS.
2. The location supplied in the ALI SHALL be composed from the caller location as determined by TCHS. If the received location is a civic location, TCHS MUST convert it to MSAG-valid form using the MSAG Conversion Service as specified in the MSAG Conversion Service section of NENA-STA-010 [4]. If the location was received by-reference, TCHS MUST dereference the location before sending to the MCS and/or composing the ALI record. If the location received was not a point, TCHS MUST convert the location to a point with uncertainty, using an appropriate algorithm, before populating it in the ALI record.
3. The TCHS MUST use Additional Data structures to obtain the information needed to populate other fields in the ALI record. If the Additional Data was delivered to PSAP "by-reference", the TCHS MUST support and use the dereferencing method identified in the INVITE to obtain the Additional Data "by-value". The TCHS MUST use the information contained in the Call-Info header field of the received INVITE to either identify the address of the target ADR to which the request will be directed, or the place in the message body where the Additional Data is provided "by-value". The TCHS MUST processes the XML-formatted Additional Data structures in the message body or received in the dereference response and uses it to populate the appropriate fields of the ALI record. Appendix A of STA-010 [4] contains mapping

tables that MUST be used to convert the data from the form used by i3 systems to legacy form, such as for the Class of Service field.

4. The composition of the ALI record by the TCHS MUST be configurable to meet the ALI format expected by the Legacy CAD.
5. The TCHS inserts the composed ALI text as specified in the Computer-Aided Dispatch Interface section of NENA-STA-027.3 [6].

5.1.4 Transitional Interworking with a Legacy Logging Recorder

Upgrading to a TCHS requires considering what capabilities are available on the legacy Logging Recorder.

A PSAP with a legacy Logging Recorder that implements one of the common legacy media capture interfaces defined in NENA-STA-027.3 [6] would require a TCHS to interwork i3 media into legacy media. In this case, the Logger operates in a legacy mode where NG9-1-1 data might be not be logged. The TCHS MUST be able to interwork audio media with the Legacy Dedicated 600-ohm analog recording output as defined in NENA-STA-027.3 [6]. The TCHS MUST close the Recorder Start Signal Pair contacts when a call is answered/off hold/unparked and reopen when released or put on hold/park. If the Legacy Logging Recorder is passively tapping the analog E9-1-1 trunks that the TCHS will be connecting to in order to receive E9-1-1 calls, this method of recording will continue to work for those calls.

A PSAP MAY use Passive IP Recording (that is the capture of IP call and media traffic off an Ethernet switch connected to the recorded device(s)). This will permit the recording of text media using Real-Time Text (RTT) and Message Session Relay Protocol (MSRP) in addition to audio until such time an i3-compliant Logging Service is deployed.

5.1.5 Interworking with a Transitional Computer-Aided Dispatch (TCAD)

If a TCAD is subscribed to a TCHS using an EIDO subscription, and the TCAD is unable to dereference Location and Additional Data URIs found in the EIDOs, then the TCHS MUST be able to be configured to pass along the values obtained from these URIs in locationDereferencedFromReference and additionalDataDereferencedFromReference elements as appropriate. This is an exception to the rule which specify that data received by reference cannot be forwarded by value.

5.2 Transitional Computer-Aided Dispatch

Computer-Aided Dispatch (CAD) is an application concerned with the details of the management of incidents. It aids the dispatcher with assignment and management of resources for incident response.

A Transitional Computer-Aided Dispatch (TCAD) MUST implement both i3 and legacy interfaces in order to permit the upgrade of CAD before the other PSAP applications. A PSAP with a legacy CHS system that implements the CAD interface defined in NENA-STA-027.3 [6] would require a TCAD to accept legacy call data.

A TCAD MUST implement the following interfaces:

5.2.1 i3 Interfaces

- A TCAD MUST comply to the NG9 1 1 Computer-Aided Dispatch (CAD) section of NENA-STA-023 [3], including but not restricted to the Incident Handling Functional Element and the Dispatch Functional Element, and more specifically:
    - EIDO interface with CHS
        - A TCAD MUST implement the client side of the EIDO Subscription interface as specified in NENA-STA-023 [3] which is based on the NENA Standard for the Conveyance of Emergency Incident Data Objects (EIDOs) between Next Generation (NG9-1-1) Systems and Applications, NENA-STA-024 [5].

5.2.2 Legacy Interfaces

- Legacy CHS Interface
    - A TCAD MUST implement the Legacy Computer-Aided Dispatch (CAD) Interface and functions as specified in the Computer-Aided Dispatch Interface section of NENA-STA-027 [6]. A TCAD MAY implement this interface over a persistent TCP [9] connection in lieu of a serial interface if supported by the CHS, for which the TCAD and the CHS MUST agree on which is the client and which is the server, and both the TCAD and the CHS MUST enable TCP Keep-Alives if heartbeat messages are not enabled.
    - In jurisdictions where the NENA ALI Query Service Standard, NENA 04-005 [13], is used (for example Canada), a TCAD MUST implement the AQS Service Consumer (AQS-SC) interface.

5.3 Transitional Logging Service

A Transitional Logging Service is a service that records NG9-1-1 and legacy media and NG9-1-1 LogEvents and provides NG9-1-1 search and retrieval interfaces.

The NG9-1-1 Logging Service is defined in NENA-STA-010 [4]. Additional specifications for a PSAP/ECC Logging Service are in NENA-STA-023 [3]. A Transitional Logging Service MUST conform to these specifications and MUST also support a legacy voice recording interface to be considered as a Transitional Logging Service conforming to this document. A PSAP with a legacy CHS that implements one of the common legacy media capture interfaces defined in NENA-STA-027.3 [6] would require a Transitional Logging Service to accept the legacy media.

A Transitional Logging Service implements the following interfaces:

5.3.1 i3 Interfaces

- SIPREC interface with CHS
    - A Transitional Logging Service MUST implement media logging as specified in the Logging Service section of NENA-STA-023 [3] which is based on the Media Recording section of NENA-STA-010 [4].
- LogEvent recording interface with logging clients
    - A Transitional Logging Service MUST implement event logging as specified in the Logging Service section of NENA-STA-023 [3] which is based on the Log Recording section of NENA-STA-010 [4].
- LogEvent and media retrieval interfaces
    - A Transitional Logging Service MUST implement the LogEvent and media retrieval interfaces as specified in the Logging Service section of NENA-STA-023 [3] which is based on the Log Recording section of NENA-STA-010 [4].

5.3.2 Legacy Interfaces

- If the legacy voice interface to be recorded is a VoIP SIP interface, a Network Interface Card and special SIP Passive IP Recording software is required in the Transitional Logging Service. A Transitional Logging Service MUST support SIP Passive IP Recording when the legacy voice interface to be recorded is a VoIP SIP interface. This will permit the recording of text media using Real-Time Text (RTT) and Message Session Relay Protocol (MSRP) in addition to audio until such time an i3-compliant CHS is deployed.
- Legacy PSAPs and ECCs have a variety of legacy voice facilities that need to be recorded, and a Transitional Logging Service need not support all possible legacy interfaces. A Transitional Logging Service MUST support the legacy voice interfaces that the PSAP or ECC needs during the transition. Supporting these legacy voice

interfaces requires additional hardware, so the agency should work with prospective logging vendors to define and design a workable solution.

Some examples of legacy voice interfaces as defined in the Voice Recording Interface section of NENA-STA-027.3 [6] are listed below. All require specialized hardware:

- Analog Trunk or Station line passive tap interface
- T1 Trunk passive tap interface
- Primary Rate ISDN passive tap interface
- 600-ohm analog audio line interface with separate "contact closure" interface

Because an NG9-1-1 Logging Service is an "all-IP" device, the hardware used might not have slots for the line interface cards needed to tap or receive legacy analog audio signals. The agency is encouraged to work with prospective logging vendors to define and design a system that provides a smooth path from the legacy environment to the NG9-1-1 environment.

How the Transitional Logging Service integrates the legacy voice interface(s) is left up to the implementer as long as it meets the needs of the PSAP/ECC.

6 Impacts and Considerations

6.1 Operations Impacts Summary

PSAPs using transitional applications will not be able to leverage all of the functionalities made available by i3. This may cause operational differences between PSAPs that have fully migrated to i3 versus those that have yet to do so. These operational differences may undermine the effort of OSPs to provide richer data to those PSAPs since it would induce doubt on their ability to actually make use of such richer data.

Multiple factors will determine the length of time a PSAP may be in transition. Appropriate planning is necessary to ensure operational continuity is maintained during the transition.

6.2 Technical Impacts Summary

Legacy E9-1-1 technologies are inherently incompatible with NG9-1-1 technologies. Maintaining legacy applications while receiving NG9-1-1 calls through a TCHS creates a technical gap where some NG9-1-1 data cannot be used or processed. Furthermore, from an OSP and a core NG9-1-1 network perspective, there is no way to confirm whether a PSAP using a TCHS would be fully or partially transitioned internally. Conversion of data between a NG9-1-1 interface and a legacy interface will lead to some data loss, especially if the data is not used in E9-1-1.

6.3 Security Impacts Summary

A transitional application is by definition supporting NG9-1-1 interfaces and are thus exposed to cybersecurity threats. As such, all transitional applications are subject to the NENA STA-040.2-2024 – NENA Security for Next Generation 9-1-1 Standard (NG-SEC) [12].

6.4 Recommendation for Additional Development Work

At publication time, no additional work has been identified. If the Industry identifies a need for it, this document could be revised to include additional transitional applications.

6.5 Anticipated Timeline

It must be understood that this is a transitional standard and will be archived when warranted. PSAPs that no longer receive calls from the E9-1-1 core network are expected to be fully i3-compliant end-to-end at that time. This document is not intended to encourage Agencies to retain legacy applications for a long period of time. Agencies are encouraged to transition to full i3 compliance at their earliest convenience. There are significant issues when not doing so.

6.6 Cost Factors

Migrating to fully i3-compliant applications is a significant investment. Agencies may be forced to transition one application at a time due to budget priorities. Please note that it may be more cost efficient to procure a new solution than to upgrade an existing legacy application. Due consideration is to be given to ensure the use of transitional applications is consistent with available funding sources and their requirements. Such consideration includes, but is not limited to, fully meeting i3 compliance that an external funding source may require to get access to the funding. PSAP maintaining legacy applications would not meet this requirement.

6.7 Additional Impacts (non-cost related)

If an Agency delays its transition over a longer period, it will likely negatively impact its interoperability with neighboring Agencies.

When legacy applications remain in place in conjunction with transitional applications, there is a risk that NG9-1-1 data may not be made available and may hamper the emergency response.

7 Abbreviations, Terms, and Definitions

See the NENA Knowledge Base (NENAkb) [1] for a Glossary of terms and abbreviations used in NENA documents. Abbreviations and terms used in this document are listed below with their definitions.

Term or Abbreviation (Expansion)	Definition / Description
ALI (Automatic Location Identification)	The automatic display at the PSAP of the caller's telephone number, the address/location of the telephone, and supplementary emergency services information of the location from which a call originates.
CAD (Computer-Aided Dispatch)	A computer-based system which aids PSAP Telecommunicators by automating selected dispatching and record keeping activities.
CHS (Call Handling System)	A communications software system and equipment used to receive and process Calls.
EIDO (Emergency Incident Data Object)	A JSON-based (JavaScript Object Notation) object that is used to share emergency incident information between and among authorized entities and systems. NENA has adopted the JSON-based EIDO (Emergency Incident Data Object) for sharing incident information among authorized NG9-1-1 entities and systems.
ESInet (Emergency Services IP Network)	A managed IP network that is used for emergency services communications, and which can be shared by all public safety agencies. It provides the IP transport infrastructure upon which independent application platforms and core services can be deployed, including, but not restricted to, those necessary for providing NG9-1-1 services. ESInets may be constructed from a mix of dedicated and shared facilities. ESInets may be interconnected at local, regional, state, federal, national, and international levels to form an IP-based internetwork (network of networks). The term ESInet designates the network, not the services that ride on the network.
Logging Recorder	A device that records, stores, and is capable of playing back all communication media within the domain to which it is assigned. Media can include, but is not limited to, voice, radio, text, and network elements involved with routing a 9-1-1 call. Logging recorders should have the capability to simultaneously record from several sources.
LogEvent	A standardized JSON object containing information about a processing event that is stored in and retrieved from the Logging Service.

Term or Abbreviation (Expansion)	Definition / Description
MSAG (Master Street Address Guide)	A database of street names and house number ranges within their associated communities defining Emergency Service Zones (ESZs) and their associated Emergency Service Numbers (ESNs) to enable proper routing of E9-1-1 calls.
MCS (MSAG Conversion Service)	A web service providing conversion between PIDF-LO (Presence Information Data Format – Location Object) and MSAG (Master Street Address Guide) data.
MSRP (Message Session Relay Protocol)	A standardized mechanism for exchanging instant messages using SIP where a server relays messages between user agents.
Passive IP Recording	The capture of IP call and media traffic off an Ethernet switch connected to the recorded device(s).
RTT (Real Time Text)	A text transmission that is character at a time, as in TTY. Technology that allows consumers to send and receive Internet Engineering Task Force (IETF) RFC 4103 text characters, as they are typed, as well as audio simultaneously.
SIPREC (SIP-based Media Recording)	A SIP-based protocol specified by the IETF for recording media. It is documented in RFC 7866.
TCAD (Transitional Computer-Aided Dispatch)	A Computer-Aided Dispatch system which assists an Agency with its migration to i3 compliance by including legacy interfaces as well as i3 interfaces.
TCHS (Transitional Call Handling System)	A Call Handling System which assists an Agency with its migration to i3 compliance by including legacy interfaces as well as i3 interfaces.
Transitional Logging Service	A Logging Recorder which assists an Agency with its migration to i3 compliance by including legacy interfaces as well as i3 interfaces.
TCP (Transmission Control Protocol)	The reliable and connection-oriented octet streaming transport protocol of the Internet protocol suite. It is specified by the IETF in RFC 9293 [9].

8 References

[1] National Emergency Number Association. "NENA Knowledge Base Glossary." Updated August 12, 2025. https://kb.nena.org/wiki/Category:Glossary.

[2] Internet Engineering Task Force. *Key words for use in RFCs to Indicate Requirement Levels. S. Bradner*. RFC 2119, March 1997.

[3] National Emergency Number Association. *NG9-1-1 PSAP and ECC Specifications for the NENA i3 Solution*. NENA-STA-023.1-202Y. Alexandra, VA: NENA, (forthcoming).

[4] National Emergency Number Association, *NENA i3 Standard for Next Generation 9-1-1*. NENA-STA-010.3e-2021. Alexandria, VA: NENA, approved October 7, 2021.

[5] National Emergency Number Association, *Conveyance of Emergency Incident Data Objects (EIDO) between Next Generation (NG9-1-1) Systems and Applications*. NENA-STA-024.1a-2023. Alexandria, VA: NENA, approved February 21, 2023.

[6] National Emergency Number Association, *NENA E9-1-1 PSAP Equipment Standards*. NENA-STA-027.1-2018. Alexandria, VA: NENA, approved July 2, 2018.

[7] Internet Engineering Task Force. *Hypertext Transfer Protocol (HTTP/1.1): Message Syntax and Routing. R. Fielding and J. Reschke*. RFC 7230, June 2014.

[8] Internet Engineering Task Force. *Session Recording Protocol. L. Portman, H. Lum, C. Eckel, A. Johnston and A. Hutton*. RFC 7866, May 2016.

[9] Internet Engineering Task Force. *S Transmission Control Protocol (TCP). W. Eddy*. RFC 9293, August 2022.

[10] Alliance for Telecommunications Industry Solutions (ATIS). *Request for Assistance Interface (RFAI) Specification*. ATIS-0500019.2010(R2015). Washington, DC: ATIS, Approved September 10, 2010.

[11] National Emergency Number Association. *NENA NG9-1-1 Transition Plan Considerations Information Document*. NENA-INF-008.2-2013. Alexandria, VA: NENA, approved November 2013.

[12] National Emergency Number Association. *NENA Security for Next Generation 9-1-1 Standard (NG-SEC)*. NENA-STA-040-2-2025. Alexandra, VA: NENA, (forthcoming).

[13] National Emergency Number Association, *NENA ALI Query Service Standard*. NENA 04-005. Alexandria, VA: NENA, approved November 21, 2006.

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