



9-1-1 Managed Services Technical Review

PHASE II – TASK 4

WRITTEN REVIEW OF CENTURYLINK RESPONSES

UPDATED VERSION SUBMITTED AUGUST 2014 TO:
STATE OF ARIZONA 9-1-1 PROGRAM



MissionCriticalPartners
MissionCriticalPartners

690 Gray's Woods Boulevard, Suite 120 | Southlake, TX 76092 | 888.8MCP.911 | www.MCP911.com

2920 West Southlake Boulevard, Suite 120 | Southlake, TX 76092 | 888.8MCP.911 (888.862.7911) | www.MCP911.com



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1. BACKGROUND

The State of Arizona 9-1-1 Program (Program) has retained Mission Critical Partners, Inc. (MCP) to support its review of CenturyLink's Managed Services offering. This document summarizes the additional information that the Program requires CenturyLink to provide in order to complete its evaluation of the proposed services.

The topics are separated into two lists: contractual documentation requirements and general clarification of services. Each table contains headers of Topic Area, Commentary, and Reference. The Topic Area section provides a brief description of the issue. The Commentary section describes the issue in detail. The Reference section, which is contained in Table 2, provides the CenturyLink document title.

Table 1 – Technical Documents Reviewed

Document Name	Description
A9-1-1 Great Migration Plan for AZ	June 2012 proposal for bundled, managed NG9-1-1 services offering
AZ NG9-1-1 Technical Review 4-14-14	CenturyLink Next Gen 9-1-1 and Managed 9-1-1 CPE Technical Overview for Arizona Solution
Clearview reports - A911	Guide for using Clearview reporting tool
Managed 911 - Service Level Goals - 6-11-2013	Description of CenturyLink Service Level Goals for 9-1-1 Routing and ALI Management Services
MapSAG	Intrado marketing sheet for MapSAG product
MPLS SLAs 6-11-2013	CenturyLink MPLS VPN Service Level Agreement
NG911 Managed Services - Arizona Network	Detailed network diagram
PAD MOP CenturyLink Work and Testing Instructions 102313CH Final	Work instructions document for PSAP Abandonment Device (PAD)
PowerProbe6000AndPowerProbe500_CCW-20472-0_DS_NM_0	PowerProbe marketing booklet for PowerProbe 6000 and PowerProbe 500 devices
Denver dn1	CenturyLink marketing sheet for Denver 1 data center
Denver dn2	CenturyLink marketing sheet for Denver 2 data center
Denver dn3	CenturyLink marketing sheet for Denver 3 data center
MCP Responses Set 1 sed	CenturyLink responses to MCP's request for additional documentation
PBN-2013-Third Party IP-Recording Kit	Intrado's IP recording product bulletin



2. CONTRACTUAL DOCUMENTATION REQUIREMENTS

The Program requires CenturyLink to incorporate all of the commitments, service descriptions, processes, and service-offering documentation into a single, consolidated CenturyLink Services Exhibit (Exhibit). The Exhibit should detail the scope of services and act as a guide to the Program and the state's public safety answering points (PSAPs), with sufficient detail so that the reader will have a good understanding of the features, functionality, and operational procedures related to the services. It is anticipated that existing documentation may contribute to the development of the Exhibit. Should CenturyLink choose to use the referenced documentation, the Program requires updates to the text as detailed in Table 2.

At a minimum, the Exhibit should include the following outline of service topic areas:

1. Managed Services Offering Description (general description of included services)
2. A9-1-1 Emergency Services Internet Protocol (IP) Network (ESInet)
 - a. Network design and management descriptions
 - b. Updated network diagrams
3. A9-1-1 Routing
 - a. Alternate and abandonment routing configuration options
 - b. PSAP abandonment device (PAD)
 - c. Legacy Network Gateway (LNG)
4. A9-1-1 i3 Routing
 - a. Emergency Services Routing Proxy (ESRP)
 - i. Queue management capabilities
 - b. Policy Routing Function (PRF)
 - i. User interface description
 - ii. Available policies
 - c. Location Validation Function (LVF)
 - i. Data management portal
 - d. Emergency Call Routing Function (ECRF)
 - i. Spatial Information Function (SIF) updates
 - e. Border Control Function (BCF)
 - f. Forest Guide
5. A9-1-1 Location Data Management
 - a. Automatic Location Identification (ALI)
 - b. Location Information Server (LIS)
 - c. Call Information Database (CIDB)
 - d. 9-1-1 Net
 - e. Enterprise Geospatial Data Management System (EGDMS)
6. A9-1-1 VIPER
 - a. i3 Guarantee
 - b. Power 911



- c. MapFlex
- d. Power MIS
- e. Logging interfaces and support
- 7. VESTA
 - a. i3 Guarantee (if applicable)
 - b. Sentinel
 - c. ORION Vela
 - d. ORION DataSync
 - e. Aurora
 - f. Logging interfaces and support
- 8. A9-1-1 Geographic Information System (GIS) Data Management
 - a. MapSAG
- 9. A9-1-1 TXT29-1-1
 - a. Integrated with Power 911
 - b. Browser description
- 10. A9-1-1 Data
 - a. Address Intelligence
 - b. Media
- 11. Reporting and Logging
 - a. ClearView
 - b. i3 Event Logging
 - c. PowerProbe
- 12. Program Management Support
 - a. Product lifecycle management
 - b. Software and hardware refresh program
 - c. Out-of-scope requests
- 13. Training
 - a. A9-1-1 systems and support applications
 - i. On-site
 - ii. Ad-hoc
 - iii. Web-based
 - b. Call handling systems
 - i. On-site
 - ii. Ad-hoc
 - iii. Web-based
- 14. Maintenance, Monitoring and Support
 - a. System backup
 - b. System maintenance
 - c. Network operations center (NOC) support
 - d. Notification times for service-affecting outages
 - e. Response times
 - f. On-site response times



- g. Repair times
 - h. Incident severity levels
 - i. Security incident severity levels
15. Service Level Agreements
- a. Software update timing
 - b. Proactive hardware refresh
 - c. Firmware updates
 - d. Network performance metrics
 - e. Maintenance response and repair times
 - f. i3 Guarantee
16. System Availability Metrics
- a. Reporting
 - b. Security incidents
17. i3 Guarantee
- a. Explanation of the guarantee

MCP Response:

For Task 6 of the second Phase of the Managed Services Technical Document Review project, CenturyLink developed a comprehensive Services Exhibit as requested above. Throughout the month of July 2014, MCP worked with CenturyLink and the Program to refine the Exhibit to meet the Program's requirements. As noted in the "Phase II, Task 4 Commentary" column below, some items remain open for negotiation between the Program and CenturyLink.



Table 2 – Contractual Documentation Requirements

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
i3 Call Transfers	<p>Please describe how the Managed Services solution will interconnect with other i3 networks, either in-state regional networks or neighboring state networks. The services description should identify transfer services that will be supported, which should include, but are not limited to: voice; text to 9-1-1; location data; supplemental data; call types; the i3 interface(s) and protocols that will be used; physical points of interconnect; and whether additional fees may apply for said interoperability.</p> <p>CenturyLink Response: The proposed solution does not contain any provisions for interconnecting other i3 networks. However, interconnecting is available and is described in section 10.2.</p>		<p>Meets requirements.</p> <p>The Program should note that additional fees will be assessed when the need arises for interconnecting with other i3 networks.</p>
Legacy Selective Router Transfers	<p>Please describe whether ALI will be provided in legacy selective router (LSR) call transfers to and from LSRs and switches, including those from alternative service providers. What limitations to LSR call transfers, such as ALI only being available for certain call types, should be included in the documentation? Please describe whether there are any additional costs associated with the connectivity and services described in Section 7.3.</p> <p>CenturyLink Response: See new section 7.4</p> <p>The standard offering includes ALI only transfers with wireless or VoIP calls and not wire-line calls. Given that the State uses CenturyLink ALI databases today, processes could be put in place to use State ALI nodes in place of/to supplement the National ALI nodes so that wire-line ALI could be transferred. This would be additional effort and associated cost beyond the</p>	<p>AZ NG9-1-1 Technical Review 4-14-14, Section 7.2 & 7.3</p>	<p>Meets requirements.</p> <p>Per Task 2, MCP considers this a critical implementation item.</p>



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	<p>scope of the current offering and would require CenturyLink commitment.</p> <p>The proposed transition configuration steps include installing a Legacy Selective Router Gateway (LSRG) between the ESInet and the legacy Tandem routers. This makes possible the following services:</p> <ul style="list-style-type: none">Allows PSAPs on the ESInet to receive 9-1-1 calls from the Legacy Selective routers until the TSP's have migrated their circuits over to the ESInet.Allows call transfer with additional information between PSAPs still on the legacy tandems and PSAP on the ESInet.Allows call transfer with additional information between PSAPs on the ESInet and PSAPs on the legacy tandems. <p>Intrado assumes connectivity to legacy PSAPs will continue to be provided from the legacy selective routers during the migration phase, The migration strategy includes establishing legacy tandem connectivity to the ESInet at the LSRGs. Legacy PSAPs will continue to receive their 9-1-1 traffic from the legacy selective routers until the PSAPs upgrade to become A9-1-1 Routing (RFAI) or i3-based PSAPs. Optionally, PSAPs could connect to the ESInet and continue to function as legacy PSAPs using Legacy PSAP Gateways (LPG). This enables legacy PSAPs, A9-1-1 Routing (RFAI) and i3-based PSAPs to be homed on the ESInet and they will be able to interoperate by transferring 9-1-1 calls with ANI and ALI. Legacy PSAPs will receive 9-1-1 voice via their existing CAMA trunks and continue to bid ALI until their migration is completed.</p>		



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	<p>Use of the LSRG may eliminate the requirement for Legacy PSAP Gateways (LPGs), since PSAPs migrated to the ESInet can still communicate to PSAPs not yet migrated. Intrado realizes there may be specific cases during the migration process where LPGs are required and will be provided. If required, specifications of the LPG are provided below:</p> <p><u>LPG</u> Calls routed via the ESInet and delivered to a legacy PSAP will undergo signaling interworking to convert the incoming Session Initiation Protocol (SIP) signaling to the traditional Multi-Frequency (MF) or Enhanced Multi-Frequency (E-MF) signaling supported by the legacy PSAP. The LPGs will allow legacy PSAPs to receive calls and retrieve Automatic Location Identification (ALI) data the same way they do today.</p> <p>The LPG will also support an ALI interface over which it can receive and respond to ALI queries from legacy PSAPs. Interfaces to a Location Information Server (LIS) and a Legacy Network Gateway (LNG) will also be supported by the LPG so that it can perform a de-referencing operation if the SIP signaling from the ESInet includes a location-by-reference. In addition, the LPG will support an Emergency Call Routing Function (ECRF) interface to facilitate certain emergency call transfer scenarios, as well as interfaces to the Call Information Databases (CIDs) to provide access to additional non-location data associated with the emergency call, if a reference to such data is provided in incoming SIP signaling.</p> <p><u>LSR Transfer Limitations</u> Transfers to or from Legacy Selective Routers are voice transfers only. There is no mechanism for transferring the PIDF-LO or the Emergency Incident Data Document (EIDD) to</p>		



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	<p>exchange location data and any other supplemental data or alternatively URIs to the dereferencing systems that would provide the data or data updates to the PSAP. Legacy PSAPs with CAMA connectivity must bid the legacy ALI systems to retrieve location information as they do today regardless of whether they are connected to the ESInet.</p>		
NENA i3 – General	<p>Please describe the PSAPs' i3 migration process, the timing with making the move from legacy systems to i3, and any limitations of the service.</p> <p>CenturyLink Response: This has been added to section 11</p>	<p>A9-1-1 Great Migration Plan for AZ – references throughout the document</p> <p>AZ NG9-1-1 Technical Review 4-14-14, Section 12</p> <p>MCP Responses Set 1 sed</p>	<p>Meets requirements.</p> <p>MCP recommends that the Program request that CenturyLink provide a list of requirements or steps for PSAPs to take in order to move from legacy or IP selective router (IPSR) services to an i3 Routing solution.</p>
Emergency Call Routing Function (ECRF) and Location Validation Function (LVF)	<p>Please provide additional documentation on what feature functionality the ECRF and LVF will provide the PSAPs. At a minimum, the additional documentation should describe: the features that these systems will provide; how validations will be made; the interface to the communication service providers (CSPs); how updates to the ECRF are performed; how the GIS data is managed/coalesced between all GIS data providers; how conflicts are managed between GIS data sources; what happens when a CSP's record cannot be validated; and the Internet Engineering Task Force (IETF) Request For Comments (RFC) for those functions that are in compliance.</p> <p>CenturyLink Response: This has been added to section 10</p>	<p>AZ NG9-1-1 Technical Review 4-14-14, Section 12.1.1</p> <p>A9-1-1 Great Migration Plan for AZ, Appendix A</p> <p>MCP Responses Set 1 sed</p>	<p>Meets requirements.</p>
Emergency Services Routing Proxy (ESRP) and Policy Routing Function (PRF)	<p>Please provide additional documentation on the interfaces and protocols that the ESRP will support, its queue management capabilities with the proposed call handling systems, and the</p>	<p>MCP Responses Set 1 sed</p>	<p>Meets requirements.</p>



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	<p>IETF RFCs for which the functions are in compliance.</p> <p>CenturyLink Response: This has been added to section 10</p>		
Event Logging Service	<p>Please provide additional documentation on the event logging interface, call event log details, and the i3 event logging system's reporting capabilities.</p> <p>CenturyLink Response: This has been added to section 10</p>	MCP Responses Set 1 sed	Meets requirements.
Forest Guide	<p>Please provide additional documentation on the Managed Services' support for Forest Guide routing. At a minimum, the additional documentation should describe how the service will interface with a state-level and/or national Forest Guide and what IETF RFCs the system will support pertaining to Forest Guide</p> <p>CenturyLink Response: This has been added to section 10</p>	Not applicable	Meets requirements.
i3 Guarantee	<p>Please define the remedies if the Managed Services do not support all i3 functions and protocols, i.e., what is the process for raising concerns regarding i3 compliance after Managed Services go live? Please advise if the i3 Guarantee applies to the entire Managed Services offering, including the Cassidian VESTA call handling solution and its associated applications, such as Aurora, Data Sync, and Vela. Please provide the i3 Guarantee language in a consolidated CenturyLink Exhibit.</p> <p>CenturyLink Response: i3 only applies to the Intrado and not to Cassidian. CENTURYLINK has ID all the functions that are supported in the service exhibit. Remedies would be per contact language and will not be a part of the technical response.</p> <p>August 25th Update: Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.</p>	A9-1-1 Great Migration Plan for AZ, pages 1, 2 and 4	Meets Requirements.



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
<p>PSAP Gateway Manager (PGM) Terminal Server</p>	<p>Please remove PSAP gateway managers (PGMs) from the hosted customer premise equipment (CPE) solution design, including all diagrams and solution descriptions. Support for PGMs is still desired, but only for other CPE systems on the ESInet that do not use the Managed Services' bundled VIPER or VESTA solutions.</p> <p>CenturyLink Response: We can remove any PGMs for VIPERs and/or VESTAs that are deployed under this offering. However, The PGM is not the same as a "gateway" it is a group of products including terminal server for rebooting routers and will be installed at the host sites. I have removed from the drawings.</p>	<p>AZ NG9-1-1 Technical Review 4-14-14, Section 5.0, third bullet</p> <p>NG911 Managed Services - Arizona Network Diagram</p>	<p>Meets requirements.</p> <p>Per Task 2, MCP considers this a critical implementation item.</p>
<p>Redundant</p>	<p>Please describe the redundancy of critical support components such as the network operations center (NOC), monitoring systems, provisioning systems, backup systems, and data archive systems.</p> <p>CenturyLink Response: The CenturyLink 911OPS center has an established Disaster Recovery Plan and a back up location that is tested yearly to insure continuity of the NOC Center. Short term issues we can roll our calls to another group located in Denver, and Long term we have the alternate site located in St. Paul MN that can be staffed in approximately 30 minutes. The 911 Profiles and ticketing system are located on redundant servers and interconnected utilizing the company CO-LAN network. The NG911 provider has the actual provisioning, monitoring, and call data bases for the NG911 network and they will need to provide information regarding those systems</p> <p>Please advise if redundant Layer 2 connectivity between the VESTA cores is appropriate. If not appropriate, please advise on what effect will be experienced if the single Layer 2</p>	<p>NG911 Managed Services - Arizona Network Diagram</p>	<p>Meets Requirements.</p> <p>Per Task 2, MCP considers this a critical implementation item.</p>



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	<p>connection between the VESTA hosts is severed. What will happen to in-progress calls and the synchronization of systems?</p> <p>CenturyLink Response: Layer 2 connectivity between VESTA cores uses best practice, 2 redundant connections. Diagram updated.</p>		
	<p>Please provide details where redundant and diverse IP is not available to the PSAP.</p> <p>CenturyLink Response: Diverse is an option for all PSAPs, but for this service offering, all remote PSAPs will use redundant loops, not diverse loops (separate entrance facility with 25 feet separation). All network CPE will be diverse.</p> <p>Please provide detailed network mapping down to the card level, to ensure that there is no single point of failure.</p> <p>CenturyLink Response: Card level mapping will be provided when orders for circuits are placed. This is not reserved before orders placed. Host site drawings do show the diverse RODAMs and devices</p>	<p>AZ NG9-1-1 Technical Review 4-14-14, Section 6.1</p>	<p>Meets requirements.</p> <p>Per Task 2, MCP considers this a critical implementation item.</p> <p>Confirmation of the redundant network loops with no diversity provides the Program and the state's PSAPs with an understanding of the environment in which they will be operating. This scenario is no different than what the PSAPs have today and therefore should not be considered a downgrade in service or an additional risk to the PSAP's operations.</p> <p>It is understandable that card level mapping is not available until circuit orders are placed. MCP has inserted the card mapping commitment in Section 5.2 of the Services</p>



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
			Exhibit.
Proper Gateways for Service Providers	<p>Please provide a service description in the consolidated Exhibit detailing the points of interconnect (POI) for Session Initiation Protocol (SIP) call delivery, and the process for migrating carrier traffic from the gateways to the SIP POIs.</p> <p>CenturyLink Response: Added to Section 10.4.2</p>	AZ NG9-1-1 Technical Review 4-14-14, Section 11.0	Meets requirements
PSAP-to-PSAP Communications	<p>Please provide a commitment in the Exhibit for monitoring the call transfer volumes and adjusting capacity accordingly, similar to the language regarding ingress traffic monitoring.</p> <p>CenturyLink Response: Reworded paragraph below</p> <p>As a PSAP is migrated to a NG PSAP, CenturyLink will replace the existing EM trunks from the Legacy Selective Router (LSR) to the PSAP with SR trunks from the LSR to the LNG Gateways. CenturyLink's recommended design will be a ratio of (1.3) ES trunks for every (1) legacy EM trunk. Additionally, trunks from the LNG to the LSR are needed to support call transfers from NG PSAPs to Legacy PSAPs or vice versa, which may also impact the required ratio. During the migration of PSAPs from the legacy network to the ESInet, CenturyLink will monitor the traffic volumes and may adjust this ratio up or down as needed. See section 10.4</p>	<p>AZ NG9-1-1 Technical Review 4-14-14, Section 11.0</p> <p>“Additionally, trunks from the LNG to the LSR are needed to support call transfers from NG PSAPs to Legacy PSAPs or vice versa, which may also impact the required ratio.”</p>	Meets requirements.
Text Integration	<p>Please provide documentation in the Exhibit explaining that the Cassidian solution will provide text delivery directly to the call handling user interface (UI). It is the Program's desire that this functionality be similar across both call handling platforms, in order to enable call takers to process text messages in the call taking UI without the need for a separate window or Web-browser.</p>	AZ NG9-1-1 Technical Review 4-14-14, Section 7.1	<p>Meets requirements.</p> <p>The topic of text-to-9-1-1 service being included in the Managed Services offering is a separate item that is to be negotiated by the Program.</p>



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	<p>CenturyLink Response: Text messaging integration is now being offered on Cassidian VESTA as well as Intrado's VIPER system. This interface is included with the proposed solution to Arizona PSAPs at no additional cost.</p> <p>However, a text messaging service is required to move text messages from wireless carriers to NG9-1-1 enabled PSAPs. This service is not a part of the CenturyLink proposed solution. For PSAPs requiring this functionality, CenturyLink can provide per-seat pricing options.</p> <p>Cassidian documentation for support of text messaging is attached, VESTA SMS_PB 06-2014</p>		
Security	<p>Please provide details in the consolidated Exhibit defining "appropriate levels of security," "industry standard security procedures," and "security measures."</p> <p>Please provide details in the consolidated Exhibit that CenturyLink performs background checks on all staff that have access to the system, including sub-contractors and solution partners.</p> <p>CenturyLink Response: See New Section 5.5 and down</p>	<p>AZ NG9-1-1 Technical Review 4-14-14, Section 6.2</p> <p>Bold formatting applied by MCP to highlight the statements referenced:</p> <p>"The iQ MPLS private port will have the appropriate levels of security in place both at the physical and application layers."</p> <p>"The CenturyLink provided iQ MPLS private port will have the appropriate levels of security in place both at the physical and application layers, as determined within IPP. CenturyLink will secure</p>	Meets requirements.



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
		<p>the CenturyLink-provided iQ MPLS private port using industry standard security procedures against security attacks from other networks or the public Internet.</p> <p>“CenturyLink will employ security measures where a PSAP may have dual-homed CPE (connected to both the CenturyLink solution and another service provider’s network).”</p>	
PowerProbe Servers	<p>What PowerProbe services will be provided in the Managed Services offering? Details should include what metrics (if any) will be made available to the Program and PSAPs. Will metrics be available on an ad hoc, per call basis, or in consolidated daily/weekly/monthly reports?</p> <p>CenturyLink Response: PowerProbe servers will be used to simulate VoIP traffic for benchmarking and service assurance. Not reports are available on these products. All metrics will be included in the ClearView reports.</p> <p>CenturyLink Response: P1 grade of service is the responsibility of each carrier. CenturyLink will continue to measure P1 grade of service as it does today. CenturyLink will run and provide these reports as follows:</p> <ul style="list-style-type: none"> • 30 Days after a PSAP has migrated. • On a quarterly basis for all migrated PSAPs <p>The frequency of these reports will ensure that a P1 grade of</p>	<p>PowerProbe6000AndPowerProbe500_CCW-20472-0_DS_NM_0</p>	<p>Meets requirements.</p> <p>The commitment to provide reports is detailed in Section 12.10.1 of the Services Exhibit.</p>



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	<p>service is being maintained. These reports will be made available to the PSAPs and will be included</p>		
System Backup	<p>Please provide details for system backup. These details should be provided in the consolidated Exhibit with information on what systems are backed up; the frequency of backups; and the process for change management, backup retrieval and restoration.</p> <p>CenturyLink Response: See New Section 6</p>	All documentation	<p>Meets requirements.</p> <p>Per Task 2, MCP considers this a critical implementation item.</p>
Local GIS data management with each of the nineteen 9-1-1 systems	<p>Please provide additional detail in the consolidated Exhibit regarding the tools, processes and limitations related to the sharing and coalescing of 19 GIS datasets into an enterprise GIS database.</p> <p>Please provide additional detail in the consolidated Exhibit describing the ability of the Managed Services to field map the GIS data schema so that the nineteen 9-1-1 systems may continue to manage their GIS data as they do today. The solution description should describe any limitations to unique field mapping for up to 19 data sources.</p> <p>CenturyLink Response: Added Section 14</p>	Not Applicable	<p>Meets requirements.</p> <p>Per Task 2, MCP considers this a critical implementation item.</p>
Enterprise map updates to be provided to each PSAP	<p>Please provide additional detail in the consolidated Exhibit describing the process for updating the remote GIS application servers. The Exhibit should describe how the solution will support a state-level, enterprise map that publishes updates to multiple call handling host systems, which then feed each of the remote PSAPs' GIS application servers. Limitations and assumptions of the Managed Services should be stated in the consolidated Exhibit.</p> <p>CenturyLink Response: Added section 14</p>	AZ NG9-1-1 Technical Review 4-14-14, Sections 15.3, 15.4 and 15.5	<p>Meets requirements.</p> <p>Per Task 2, MCP considers this a critical implementation item.</p>
Ingress Network Design	Please incorporate a solution design that enables CSPs to	AZ NG9-1-1 Technical	Meets Requirements.



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	<p>direct connect to LNGs initially, and not in a phase after deployment.</p> <p>CenturyLink Response: CenturyLink will not allow CSPs (assuming you mean Frontier, etc) to direct connect in the initial phase. This will take additional planning and coordination to accomplish as well as interconnect agreements, etc and costs will need to be determined at that time.</p> <p>Intrado Response:</p> <p>We encourage the direct connection of CSPs to the LNGs, however as noted this is not in scope of this project, timing can depend on the Carriers, and on factors not under Intrado or CenturyLink’s control. We would also like to understand how this is reconciled with the request to have SIP ingress; is this to be the same as the SIP ingress request, or direct connect through legacy connectivity. If the latter, that is standard connectivity to the LNGs just as the connection from the LSR to the LNGs. Would also like to discuss with the State what functionality/resilience enhancements desired with this architecture so we may understand the motivation for the request.</p> <p>Added sentences to document in Section 10.4.1</p> <p>August 25th Update: Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.</p>	<p>Review 4-14-14, Section 11</p> <p>“As the PSAP is migrated to a NG PSAP, CenturyLink will update the routing in its LSR and based on ESN, deliver the call over the EM trunks to a legacy PSAP or over the SR trunks to the LNG and then over the ESInet to a NG PSAP.”</p>	
Egress Network Design	<p>Please insert a statement to the effect of “Regardless of bandwidth sizing, the Managed Services fees will provide for the bandwidth required to deliver services between the host CPE sites and each PSAP.”</p> <p>CenturyLink Response: This is not the case. If PSAP requests that ringdown lines and PSAP to PSAP conferences</p>	<p>AZ NG9-1-1 Technical Review 4-14-14, Sections 13.7.2 & 13.7.4</p> <p>“CenturyLink and Intrado will determine the exact required bandwidth each PSAP will</p>	Meets Requirements.



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	<p>be done over the Host / Remote Network, instead of over the PSTN, then additional bandwidth will be required at remote sites. Bandwidth has been calculated that all ringdowns will be over the PSTN or over customer's network. Admin lines will be used for PSAP to PSAP communications. 911 calls will be placed over the Host / remote networks. If the PSAP would rather pay for the additional bandwidth for the host remote instead of PSTN charges, the cost would need to be weighed at that time so "Regardless of bandwidth sizing" is not appropriate.</p> <p>August 25th Update: Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.</p>	<p>require after site survey and call flow meeting has been conducted. Remote PSAP bandwidth above is only for estimating Host bandwidth requirements."</p>	
<p>Data center bandwidth and ECMC to VIPER configuration</p>	<p>The referenced material does not specify bandwidth allotment between the Intrado Emergency Call Management Complex (ECMC) data centers in Miami and Englewood. In review of the solution design, MCP sees the most resilient solution design as the one that provides either ECMC with the ability to set up calls with either VIPER host. For example, the Miami ECMC may send calls to the Englewood VIPER in situations where the Miami VIPER is down and vice versa. The referenced diagram indicates that the Miami ECMC only delivers calls to the Miami VIPER and the Englewood ECMC only delivers calls to the Englewood VIPER. If represented accurately, this configuration would be detrimental to the solution's availability, as a failure of either VIPER or ECMC would effectively take down the availability of its collocated partner ECMC or VIPER system.</p> <p>CenturyLink Response: Both the old and new drawings show both VPN into each data center. Hopefully, the new drawings will make that a bit clearer.</p>	<p>AZ NG9-1-1 Technical Review 4-14-14, Section 13.6</p> <p>NG911 Managed Services - Arizona Network Diagram</p>	<p>Meets requirements.</p> <p>Per Task 2, MCP considers this a critical implementation item.</p>



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	<p>Please clarify the ECMC/VIPER solution design and the bandwidth requirements between the Miami and Englewood data centers. A meshed configuration between the ECMCs and VIPERs is recommended. MCP believes that it is the intent that virtual private networks (VPNs) C & D provide the meshed connection between ECMCs and VIPERs; however, the VPNs between the ECMCs and VIPERs are not labeled on the referenced diagram.</p> <p>Please update the referenced diagram to depict the iQ Private Port VPN C & D clouds connecting the two ECMCs.</p> <p>CenturyLink Response: Please see updated drawings</p>	<p>AZ NG9-1-1 Technical Review 4-14-14, Diagram above Section 14.4</p>	<p>Meets requirements.</p>
VPN C & D	<p>In the referenced documentation, MCP believes that VPNs C & D are not only local, but provide connectivity between data centers and points of presence (POPs). Please confirm this understanding and if true, then CenturyLink should delete the word “local” in the second bullet in Section 14.4, as the VPNs provide connectivity beyond the local ECMC and VIPER node.</p> <p>CenturyLink Response: For Intrado VIPER, this can and is local. For VESTA, it is not local.</p>	<p>AZ NG9-1-1 Technical Review 4-14-14, Section 14.4</p> <p>NG911 Managed Services - Arizona Network Diagram</p>	<p>Meets requirements.</p>
Inter-VIPER Network	<p>The referenced VIPER diagram shows a network connection between VIPER primary node and VIPER secondary node. This network connection and its associated bandwidth are not discussed in the Technical Review document, nor is it depicted in the NG911 Managed Services – Arizona Network Diagram.</p> <p>CenturyLink Response: All bandwidths are discussed in the technical review. See section 17.</p> <p>Please clarify if this network connection will be provided in the Managed Services offering. If it is required, then CenturyLink should update the diagrams to reflect this connectivity and add</p>	<p>AZ NG9-1-1 Technical Review 4-14-14, VIPER Diagram titled “Multi-Node” above Section 15.3</p>	<p>Meets requirements.</p>



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	<p>language to the consolidated Exhibit detailing the bandwidth required between the two systems.</p> <p>CenturyLink Response: VIPER has no layer 2 connectivity between hosts. Workstations will point to second node when 1st node is lost.</p> <p>MCP recommends that this connectivity be on separate VPNs similar to the rest of the solution design.</p> <p>CenturyLink Response: See updated drawings</p>		
VIPER Configuration	<p>The referenced diagram depicts the VIPERs in a primary/secondary configuration. An active-active solution design combined with a meshed configuration with the ECMCs will enable both systems to be continually active in processing calls between both ECMCs for all PSAPs.</p> <p>CenturyLink Response: VIPER will be in a Primary and Secondary configuration. It is not configured Active/Active. However, some positions will have Node A as primary and node B as secondary and vice versa for others.</p> <p>Is the VIPER configuration able to be configured such that either node is constantly processing calls in a balanced manner between ECMCs, and that both sites will be sized to process 100 percent of the expected calls with room for future expansion? The details of the CenturyLink response should be reflected in the consolidated Exhibit.</p> <p>CenturyLink Response: VIPERs are configured to process 100% of calls in the State of Arizona for all positions failing over to one host.</p>	<p>AZ NG9-1-1 Technical Review 4-14-14, VIPER Diagram titled "Multi-Node" above Section 15.3</p>	<p>Meets requirements.</p> <p>Per Task 2, MCP considers this a critical implementation item.</p>



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
VESTA Configuration	<p>The referenced diagram depicts main and backup sites. Per the discussion immediately above, please clarify if the VESTAs are configured as active-active or in a primary/secondary configuration, and that both sites will be sized to process 100 percent of the expected calls with room for future expansion. The details of the CenturyLink response should be reflected in the consolidated Exhibit.</p> <p>CenturyLink Response: VESTA does not work in an Active / Active configuration, only Active / Standby is supported. Therefore, each core is configured to support 100% of the expected call volumes and will be sized accordingly. The layer 2 connection between cores will be configured as well to handle 100% of call volume.</p>	<p>AZ NG9-1-1 Technical Review 4-14-14, VESTA Diagram below Section 15.2</p>	<p>Meets requirements.</p> <p>Per Task 2, MCP considers this a critical implementation item.</p>
VESTA Host Site Consoles	<p>The referenced diagram shows consoles at host sites. This will not be the case. Please update the diagram to accurately reflect the services/systems that will be deployed.</p> <p>CenturyLink Response: The mentioned drawing is a "Typical Host Remote system, not Arizona Specific. Please refer to Arizona specific drawing that shows all consoles at remote site</p>	<p>AZ NG9-1-1 Technical Review 4-14-14, VESTA Diagram below Section 15.2</p>	<p>Meets requirements.</p>
IP Routers	<p>In the referenced diagram, it appears that the IP routers located in each location are logical representations and not physical representations. Please confirm this interpretation and if correct, then request that CenturyLink add a note to the diagram with an explanation of logical representation of routers.</p> <p>CenturyLink Response: See updated diagrams</p>	<p>NG911 Managed Services - Arizona Network Diagram</p>	<p>Meets requirements.</p>
Tempe POP and VPN A	<p>In the referenced diagram, the Tempe POP in the left, middle section of the diagram in LATA 602 shows VPN A ingress to the Tempe POP, with its egress connectivity to the iQ Private Port VPN B cloud. MCP believes that this is an error and the</p>	<p>NG911 Managed Services - Arizona Network Diagram</p>	<p>Meets requirements.</p>



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	<p>egress connectivity from this POP should connect to the iQ Private Port VPN A cloud.</p> <p>Please review the diagram and advise if this observation is correct. If confirmed, please provide an updated diagram.</p> <p>CenturyLink Response: See updated diagrams</p>		
VPN E & F	<p>In the referenced diagram, MCP believes that the VPN E & F notes to the right of the Englewood data center and below/right of the Phoenix VESTA host (in the upper right corner) should be updated to state “VPN E & F are part of the VESTA Host and Remote network.” It currently reads “VPN E & F are part of the VIPER Host and Remote network.”</p> <p>Please review the diagram and advise if this observation is correct. If confirmed, please provide an updated diagram.</p> <p>CenturyLink Response: See updated diagrams</p>	NG911 Managed Services - Arizona Network Diagram	Meets requirements.
Phoenix VESTA Host Connections to VPNs E & F	<p>In the referenced diagram, VPN E connects from the Phoenix VESTA host to the Tempe POP, which connects to the iQ Private Port VPN F cloud. Similarly, VPN F connects from the Phoenix VESTA host to the Phoenix POP, which connects to the iQ Private Port VPN E cloud. MCP believes that the Tempe POP should connect to the VPN E cloud and the Phoenix POP should connect to the VPN F cloud.</p> <p>CenturyLink Response: See updated diagrams</p>	NG911 Managed Services - Arizona Network Diagram	Meets requirements.



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	<p>& H are for the Host / Remote c and are not here</p> <p>This line should connect to iQ Private Port VPN E Cloud</p> <p>This line should connect to iQ Private Port VPN F Cloud</p> <p>615 N 48TH ST Floor 1, Ste 125B PHOENIX AZ 85008 IODATA DCID 772</p> <p>PGM Terminal Server</p> <p>L2 10 Wave</p> <p>1G VPN D, 1G VPN C, 1G VPN E, 1G VPN F</p> <p>POP TEMPAZCC 135 W Orion St Tempe AZ 85283</p> <p>LATA 602</p> <p>POP PHOENAZULI 2120 N Central Ave Phoenix AZ 85003</p> <p>iQ Private Port VPN E</p> <p>iQ Private Port VPN F</p> <p>NxDS1 VPN E, NxDS1 VPN F</p> <p>Remote VESTA PSAP</p> <p>VPN C & D are part of the NG9-1-1 Network. VPN E & F are part of the VIPER Host and Remote network</p> <p>Please review the diagram and advise if this observation is correct. If confirmed, please provide an updated diagram.</p>		
VESTA Layer 2 Connection	<p>Discussed in "Redundant" topic area above.</p> <p>The referenced diagram shows a single Layer 2, one gigabit per second (Gbps) connection between the two VESTA host</p>	NG911 Managed Services - Arizona Network Diagram	Meets requirements.



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	<p>sites.</p> <p>Please explain if the Layer 2 connection is mission critical. If not, what processes are in place with the VESTA systems at the host sites that provide for delayed synchronization if the Layer 2 network connection is severed? If the connectivity is mission critical, then please provide a cost-benefit analysis for providing the VESTAs with redundant connectivity via diverse POPs.</p> <p>CenturyLink Response: This will be (2) Layer 2, see updated diagram</p>		
Primary/Secondary VPNs	<p>MCP believes that the referenced diagram indicates that there are primary and secondary VPNs between all components in the network. Active-Active path management provides the greatest level of reliability to ensure that no equipment or route path is ever sitting stagnant.</p> <p>Please explain if the primary/secondary VPN configuration is accurate. If so, please explain how the solution is configured so that load balancing is achieved across all components, VPNs, and IP routers for every PSAP, to enable a fully meshed solution where no component or path is stagnant.</p> <p>CenturyLink Response: VPNs will be Active / Active at the Layer 2 level. CenturyLink will be running eBGP (Layer 3) over the MPLS interfaces. BGP is not a load balancing protocol. CenturyLink is including Network Monitoring services (NMS) in the proposed solution. NMS will send “hello” and “ack” messages to PSAP routers ensuring the circuit is still up and active. This configuration is an industry “best practice” for multi-homed links using the MPLS architecture through multiple POPs and Tera-POPs.</p>	NG911 Managed Services - Arizona Network Diagram	Meets requirements.



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
<p>CenturyLink Washington Outage</p>	<p>The CenturyLink/Intrado A9-1-1 outage that occurred on April 9-10, 2014, has raised concerns regarding the proposed solution design. Upon reading the referenced outage report, it was learned that the “ticket” threshold alarm was a minor category issue that resulted in thousands of calls not being routed to the proper PSAP. As such, the Program requests that CenturyLink conduct an audit of the A9-1-1 system alarms to review if there are other alarms that are categorized as minor that should be moved to major.</p> <p>CenturyLink Response: Intrado has completed a review of alarms generated from the core application processing elements, and they verified alarm levels and in some cases adjusted specific alarm messages to be more specific.</p> <p>The Program requests that CenturyLink provide a report of findings resulting from Intrado’s A9-1-1 architecture review.</p> <p>CenturyLink Response: Intrado completed architecture reviews to ensure that no conditions exist that can stop the call processing logic and verified that access resources cannot be exhausted. Intrado also added architecture capabilities that will forward call processing from one redundant core to another core in any unforeseen situation in which call processing may be compromised. Finally, alarm messages were added to observe calls received patterns, which will alarm if calls are not appropriately processing through the system.</p> <p>The Program requests that CenturyLink share the corrective actions that are being taken to address NOC-to-NOC challenges.</p> <p>CenturyLink Response: CenturyLink and Intrado NOC to</p>	<p>CenturyLink Major Outage Report to the Washington Utilities & Transportation Commission: http://wa-bainbridgeisland.civicplus.com/AgendaCenter/ViewFile/Item/382?fileID=1386</p>	<p>Meets Requirements.</p>



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	<p>NOC process changes include the following:</p> <ul style="list-style-type: none">• A “Meet Me” bridge will be established between the two NOCs to enable an immediate line of communication when a customer impacting event is detected,• The abandonment reroute process has been streamlined and unnecessary steps in the approval process have been removed,• Intrado and CenturyLink have established a process to conduct joint troubleshooting and validation, and• There will be a monthly review of the last 30 days of tickets and incidents, and processes will be reviewed and updated as needed. <p>The Program requests that CenturyLink assure the State of Arizona that lessons learned from the ingress trunking configuration in Washington be applied to the network design for Arizona, and that diagrams be updated with accompanying notes detailing what updates were made to the proposed solution design.</p> <p>CenturyLink Response: CenturyLink and Intrado are currently working together to create an environment where the traffic is more evenly distributed between the Intrado ECMC’s located in Englewood and Miami. CenturyLink and Intrado are also working to distribute End Office traffic equally between Intrado’s Trunking Gateways (TGW) where feasible. For Load Balancing purposes, CenturyLink and Intrado will home half of the End Offices to use a primary and a secondary trunk group and home the other half of the End Offices to use the reverse (subject to the capabilities of the switching infrastructure). Finally, traffic analysis will need to be completed to group the set of End Offices to the appropriate trunk groups.</p>		



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	<p>August 25th Update: Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.</p>		
Service Level Agreements	<p>The Program requests CenturyLink to provide service level agreements (SLAs) for the Managed Services. These SLAs should define the timing for refreshing (replacing or updating) the components of the solution, as related to software, hardware, firmware, and network performance. CenturyLink SLAs must have significant remedies to ensure the maintenance and service of the system at the agreed upon levels of service. CenturyLink SLA metric reports must be provided monthly and be independently verifiable through system reports. As such, the Program requests read-only access to the monitoring and reporting systems.</p> <p>SLA topic areas should, at a minimum, include:</p> <ol style="list-style-type: none"> 1. Software SLAs addressing feature functionality and the timing for providing software updates to the system once they become available. For example, software updates will be applied to all call handling systems within a pre-determined amount of time from their general availability. 2. Hardware SLAs addressing the refresh cycle for maintaining hardware components, such that the solution is never at risk due to software system requirements, manufacturer discontinued products, and failing hardware. 3. Firmware SLAs stating CenturyLink's commitment to complete manufacturer-recommended firmware updates within a pre-defined timeframe and after lab-based regression testing has been performed with new firmware. 	Not Applicable	Meets Requirements.



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	<p>4. Network SLAs stating the network performance levels that the PSAPs should expect, such as network availability measured in minutes of downtime per year; jitter threshold; average roundtrip delay; mean opinion score (MOS); call setup time for Centralized Automatic Message Accounting (CAMA) and IP delivery; and packet loss.</p> <p>5. Maintenance SLAs defining the CenturyLink’s response to service-affecting outages for all Managed Services, including the timing of communications to the PSAP and Program. The SLAs should focus on response times and mean time to repair.</p> <p>6. i3 Guarantee SLA to address when the solution will be updated to meet future i3 versions. For example, the Managed Services offering shall be current with i3 standards, such that all systems will be updated with then-current i3 feature functionality within 12 months of the ratification of each i3 version.</p> <p>7. Managed Services SLAs defining the levels of service for other mission-critical services, including but not limited to TXT29-1-1, i3 routing functions, and the hosted call handling solution. The SLAs should not be limited to only NG9-1-1 routing and ALI.</p> <p>CenturyLink Response: SLA will be addressed in the customer’s “PSAP Service Agreement”</p> <p>August 25th Update: Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.</p>		
Service Level Goals	<p>Not acceptable. Please revise the Management Availability Performance Goal to be 99.999%.</p> <p>CenturyLink Response: This needs to be in Bob’s document</p>	Managed 911 - Service Level Goals - 6-11-2013, Section 1.2	Meets Requirements.



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	<p>August 25th Update: Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.</p>	<p>“9-1-1 Routing and ALI Management Availability Performance Goal is 99.998%.”</p>	
	<p>Please revise the Notification Goal of the Level 1 and Level 2 SLAs to be within 30 minutes per FCC Report and Order 13-158, and include periodic updates until the system is restored. The updated documentation should state that CenturyLink shall perform, and provide a report on, a root-cause analysis of all outages no more than 90 days after the restoration of service.</p> <p>CenturyLink Response: <i>Unanswered</i></p> <p>August 25th Update: Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.</p>	<p>Managed 911 - Service Level Goals - 6-11-2013, Section 1.2</p> <p>https://www.fcc.gov/document/fcc-adopts-rules-improve-911-reliability Appendix B, Part 4</p>	<p>Meets Requirements</p>
	<p>Please delete the rolling 2/4/8 months clause from the remedy statement.</p> <p>CenturyLink Response: <i>Unanswered</i></p> <p>August 25th Update: Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.</p>	<p>Managed 911 - Service Level Goals - 6-11-2013, Section 1.2</p> <p>“...mean time to repair is not met for a given rolling two months.”</p> <p>“...mean time to repair is not met for a given rolling four months.”</p> <p>“...mean time to repair is not met over a rolling 8 month period.”</p>	<p>Meets Requirements.</p>
	<p>Please update the example for Level 1 so that it is amended as follows (emphasis added to indicate the updates to the existing language):</p>	<p>Managed 911 - Service Level Goals - 6-11-2013, Section 1.2, Level 1 Example</p>	<p>Meets Requirements.</p>



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	<p>“PSAP not receiving calls, audio is not working even if only on intermittent calls, End office traffic is not able to reach PSAP, not returning ALI bids, network hardware or circuit failure to data complex.”</p> <p>CenturyLink Response: <i>Unanswered</i></p> <p>August 25th Update: Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.</p>	<p>“PSAP not receiving calls, audio is working only intermittent calls, End office traffic is not able to reach PSAP, returning ALI bids, network hardware or circuit failure to data complex.”</p>	
	<p>Please update the example for Level 2 so that it is amended as follows (emphasis added to indicate the update to the existing language):</p> <p>“... system response time problems; single sided ALI function; single sided routing function.”</p> <p>CenturyLink Response: <i>Unanswered</i></p> <p>August 25th Update: Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.</p>	<p>Managed 911 - Service Level Goals - 6-11-2013, Section 1.2, Level 2 Example</p> <p>“...system response time problems; single sided ALI function.”</p>	<p>Meets Requirements.</p>
	<p>Please update the Notification Goal for Level 3 so that it is amended as follows (emphasis added to indicate the update to the existing language):</p> <p>“as soon as possible within 1 day of the identification of the service disruption.”</p> <p>CenturyLink Response: <i>Unanswered</i></p> <p>August 25th Update: Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.</p>	<p>Managed 911 - Service Level Goals - 6-11-2013, Section 1.2, Level 3 Notification</p> <p>“as soon as possible 1 day of the identification of the service disruption.”</p>	<p>Meets Requirements.</p>



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
i3 Guarantee and Software Evergreen	<p>Please provide contractual language as to how the core i3 functions, call handling systems and GIS applications will be maintained with the latest software versions available, based on then current industry standards, including but not limited to NENA i3 and its associated supporting industry standards. This documentation should address both the Intrado VIPER and Cassidian VESTA systems.</p> <p>CenturyLink Response: <i>Unanswered</i></p> <p>August 25th Update: Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.</p>	A9-1-1 Great Migration Plan for AZ, pages 1, 2 and 4	Meets Requirements.
Maintenance for Managed Services	<p>Please provide documentation in the Exhibit for response times, coordination of troubleshooting with solution partners, feet-on-the-street support, repair times, and tiered incident management support for all of the Managed Services. If there are differences in how the troubleshooting and support will be provided between the varying services, please provide those details in the Exhibit.</p> <p>CenturyLink Response: <i>See Section 8 and Section 17</i></p>	MCP Responses Set 1 sed, Answer 2, Section 1.4.3	Meets requirements.
Out-of-Scope Requests	<p>The referenced Section 16 was not included in the CenturyLink documentation. Please make sure that the Out-of-Scope Requests section is included in the Exhibit.</p> <p>CenturyLink Response: <i>Corrected referenced section and added section on Out-of-Scope Requests.</i></p>	<p>AZ NG9-1-1 Technical Review 4-14-14, Section 3.1</p> <p>“The following ALI to ALI steering scenarios are not covered by this Service Exhibit (see Section 16, Out-of-Scope Requests)”</p>	Meets requirements.



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
QoS	<p>Please update this language to state that quality of service (QoS) will be implemented across the ESInet. NENA i3 requires that IP traffic within an ESInet must implement DiffServ (RFC2475) for QoS.</p> <p>CenturyLink Response: Added new subsection to section 5.3 for QoS</p>	<p>AZ NG9-1-1 Technical Review 4-14-14, Section 6.2</p> <p>“The CenturyLink-provided iQ MPLS private port will support QoS IP prioritization to allow the management of the prioritization of 9-1-1 voice/data/OAM network traffic”</p>	Meets requirements.
IP Address Scheme	<p>Please update this sentence in the Exhibit to include POPs, VIPER host sites, and VESTA host sites.</p> <p>CenturyLink Response: Added this</p>	<p>AZ NG9-1-1 Technical Review 4-14-14, Section 6.3</p> <p>“CenturyLink will manage the IP address scheme for Next Gen 9-1-1 Routing communications through the CenturyLink iQ MPLS private port for connectivity to ECMC sites, LNG sites and PSAPs.”</p>	Meets requirements.
Next Gen 9-1-1 Routing	<p>In the Exhibit, please clarify the meaning of the referenced section. Specifically, what does “specialized management” entail?</p> <p>CenturyLink Response: Added clarification to section</p>	<p>AZ NG9-1-1 Technical Review 4-14-14, Section 7.1</p> <p>“Next Gen 9-1-1 Routing allows for specialized management of wireline, wireless, and VoIP call types.”</p>	Meets requirements.
	<p>In the Exhibit, please clarify the meaning of the referenced section. Specifically, what are the CenturyLink-established preferences and needs? How would those apply to the PSAPs’ flexible routing instruction rules? Is the word “instruction” needed?</p>	<p>AZ NG9-1-1 Technical Review 4-14-14, Section 7.1</p> <p>“Next Gen 9-1-1 Routing will support flexible routing instruction rules, depending</p>	Meets requirements.



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	<p>CenturyLink Response: I believe this is all answered in the bullet section below this sentence Section 7.1. Also, added the below to that section below the bullet items:</p> <p>CenturyLink will work with PSAPs to define and manage the PSAP routing rules during the data gathering stage of the implementation. If PSAP or CenturyLink determines that changes need to be made, CenturyLink will make these changes without disruption of service.</p> <p>CenturyLink Response: Please note – see migration process as well</p>	<p>on CenturyLink-established preferences and needs.”</p>	
Alarm Monitoring	<p>Please define how testing support will be provided. For example, 24x7 or 8 a.m. – 5 p.m., Monday through Friday?</p> <p>CenturyLink Response: All through this section, CenturyLink states that support is 24 hours a day, 7 days a week, and 365 days a year. Or, 366 for a leap year. This applies to the whole section on monitoring and such. However, for clarity, I added this to the sentence.</p>	<p>AZ NG9-1-1 Technical Review 4-14-14, Section 8.3</p> <p>“CenturyLink will provide testing support when required to evaluate CPE connectivity problems.”</p>	Meets requirements.
IP Selective Router Functional Components	<p>The components listed in this section are not IPSR components. Please update this title to “i3 Functional Elements.”</p> <p>CenturyLink Response: Changed</p>	<p>AZ NG9-1-1 Technical Review 4-14-14, Section 12.1 Title</p> <p>“IP Selective Router Functional Components”</p>	Meets requirements.
Emergency Call Routing Function (ECRF) and Location Validation Function (LVF)	<p>Arizona PSAPs will migrate independently to i3 depending on their individual readiness.</p> <p>Please update this sentence to “PSAPs” instead of “State of Arizona.”</p> <p>CenturyLink Response: Changed</p>	<p>AZ NG9-1-1 Technical Review 4-14-14, Section 12.1.1</p> <p>“As the State of Arizona transitions from a Tabular MSAG and ESN based routing to GIS based routing,</p>	Meets requirements.



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
		the required ECRF and LVF elements will be available.”	
Border Control Function (BCF)	<p>Border Control Functions require firewalls for data traffic and session border controllers (SBC) for voice traffic. Both data and voice traffic are part of the Managed Service.</p> <p>As such, “or” must be deleted from the referenced sentence.</p> <p>CenturyLink Response: Changed</p>	<p>AZ NG9-1-1 Technical Review 4-14-14, Section 12.1.2</p> <p>“The CenturyLink solution will include Border Control Function with Firewalls (FW) and / or Session Border Controllers (SBC).”</p>	Meets requirements.
GIS Routing	<p>PSAPs must be able to migrate to geospatial routing independent of one another.</p> <p>Please update the sentence to the following:</p> <p>“The CenturyLink solution provides all required NENA i3 functional elements to support a GIS-based routing architecture as PSAPs are ready to move to this routing architecture.”</p> <p>CenturyLink Response: Changed</p>	<p>AZ NG9-1-1 Technical Review 4-14-14, Section 12.1.4</p> <p>“The CenturyLink solution provides all required NENA components to support a GIS based routing architecture when the STATE is ready to move to this routing architecture.”</p>	Meets requirements.
LNGs	<p>Please add a statement to this section that commits to placing LNGs in two data centers within Arizona.</p> <p>CenturyLink Response: Changed</p>	AZ NG9-1-1 Technical Review 4-14-14, Section 13.1	Meets requirements.



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
ESRP	<p>Please update the second sub-bullet from “ESRT/PRF” to “ESRP/PRF.”</p> <p>CenturyLink Response: Changed</p>	<p>AZ NG9-1-1 Technical Review 4-14-14, Section 14.3</p> <ul style="list-style-type: none"> • “Functional representation of proposed solution showing core components of the ECMC including: <ul style="list-style-type: none"> o LVF o ESRT/PRF o ECRF o BCF” 	Meets requirements.
PSAP Equipment	<p>Please update the section to clarify how many monitors will be provided and of what size/type, e.g., cathode-ray tube (CRT), flat-panel, 22-inch, touch screen, etc.</p> <p>CenturyLink Response: Changed</p>	AZ NG9-1-1 Technical Review 4-14-14, Section 15.5	Meets requirements.
Headset Integration	<p>There is no mention of whether headset integration services will be provided with the Managed Services. Please advise if headset integration service is included with the installation of PSAP equipment and end-to-end testing. If so, please include this in the Exhibit.</p> <p>CenturyLink Response: Added this to exhibit.</p>	Not Applicable	<p>Meets requirements.</p> <p>Per Task 2, MCP considers this a critical implementation item.</p>
Training Size	<p>Please specify the class size limit in terms of “number of attendees.”</p> <p>CenturyLink Response: Added a limit of 8 per class.</p>	<p>AZ NG9-1-1 Technical Review 4-14-14, Section 16.2</p> <p>“CenturyLink will provide (1) Agent Train the Trainer class to each new PSAP. Train-The-Trainer classes will cover all agent topics as well as tips to train the call takers specific to the PSAP. Class size is</p>	Meets requirements.



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
		limited.”	
Ad Hoc Training	<p>Please advise if the referenced ad-hoc training is at an additional fee or is included in the Managed Services. If there is an additional fee, then what is the fee?</p> <p>Also, the sentence should be updated so that the word “bases” is changed to “basis.”</p> <p>CenturyLink Response: Changed sentence to: CenturyLink will provide onsite technician support on ad-hoc basis, at no additional charge to PSAP, to demonstrate features for call taker supervisors</p>	<p>AZ NG9-1-1 Technical Review 4-14-14, Section 16.7</p> <p>“CenturyLink will provide onsite technician support on ad-hoc bases to demonstrate features for call taker supervisors. This is not in lieu of formal training.”</p>	Meets requirements.
ClearView Metrics	<p>The ClearView metrics only address IP selective router (IPSR) statistics and appear to have a gap for reporting on i3 call routing functions, data validation, text messaging, and other services included in the offering.</p> <p>Please advise if the Managed Services offering provides reporting on i3 call processing and data validation processes.</p> <p>Please specify the time zone that will be reflected in the ClearView data and how this will correlate to the unique time zone management within the State of Arizona.</p> <p>Will the ClearView reporting tool provide users with the ability to perform ad hoc reports and build their own metrics based on available data?</p> <p>Please advise if the Program will have access to these reports so that the Program may view state-level reports for all PSAPs</p>	Clearview reports - A911	Meets requirements.



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	<p>using the Managed Services.</p> <p>The Exhibit should detail the i3 call processing and data validation reporting that will be made available to PSAPs and the Program.</p> <p>CenturyLink Response: Added Intrado response to ClearView reports section.</p>		
Overall Metrics	<p>The Managed Services offering documentation contained only ClearView IPSR metrics.</p> <p>Please provide the following additional monthly metrics reports.</p> <ul style="list-style-type: none"> • Network Performance Metrics <ul style="list-style-type: none"> ○ Jitter – average ○ MOS – low, high, average ○ Round trip delay – average ○ Packet loss – average ○ Downtime – seconds per month per system ○ Call delivery time – number of calls above 3 seconds, percent of total processed • Operational Metrics <ul style="list-style-type: none"> ○ Trouble tickets opened/closed ○ Trouble tickets – average duration • Call Processing and System Provisioning Metrics <ul style="list-style-type: none"> ○ See ClearView Metrics topic area above <p>CenturyLink Response: Updated to new section below ClearView reports</p>	Clearview reports - A911	Meets requirements.



3. GENERAL CLARIFICATION OF SERVICES

The following section addresses additional documentation needs of the Program. The information requested below will assist the Program in completing its assessment of the Managed Services offering, and should be considered as significant elements in determining if the solution meets the State's requirements for Next Generation 9-1-1 (NG9-1-1) services.



Table 3 – General Clarification of Services

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
Administrative Line Demarcation	<p>Based on the description of Foreign Exchange Office (FXO), Foreign Exchange Subscriber (FXS), and T1 gateways being located at the PSAP backroom. Please provide a list of features and limitations of the administrative line solution design.</p> <p>CenturyLink Response: <i>Unanswered</i></p> <p>August 25th Update: Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.</p>	<p>AZ NG9-1-1 Technical Review 4-14-14, Sections 15.4 and 7.1</p>	<p>Meets Requirements.</p>
Logging Capabilities	<p>Please provide details on the cloud-hosted logging recorder options, the features that they provide, and the associated costs, so that PSAPs may consider those options when considering the Managed Services offering. Please advise if there are any issues with state and local laws regarding retention, access and storage of communications records when using a cloud-hosted logging solution.</p> <p>CenturyLink Response: <i>This is out of scope; however, CenturyLink is currently working with a 3rd party partner to offer a solution.</i></p> <p>August 25th Update: Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.</p>	<p>MCP Responses Set 1 sed, Answer 6</p> <p>PBN-2013-Third Party IP-Recording Kit</p>	<p>Meets requirements.</p> <p>The Services Exhibit has been updated to address the feature functionality of the logging interfaces and the respective capabilities of the two call handling solutions.</p> <p>As the cloud-hosted logging solution is out of scope for the Managed Services offering, MCP recommends that the Program and/or PSAPs consider potential issues with state and local laws regarding retention, access and storage of communications records when using a cloud-hosted logging solution.</p>



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
Security	<p>Please provide a report on the Managed Services offering's compliance with NG-SEC NENA 75-001. The report should detail what alternative preventative measures are in place to address the intent of the NG-SEC requirement for any areas where the solution is not compliant with NENA 75-001.</p> <p>Please describe whether there is a Security Operations Center (SOC), or a functional equivalent, that carries out the tasks above. The description should detail the hours of operation of the SOC, the metrics and reports that are monitored, and whether those reports may be made available to the Program and PSAPs.</p> <p>CenturyLink Response: NENA 75-002 is the companion document to 75-001 that provides for compliance audit to 75-001. For the 396 audit items, the below list are the ones where Intrado's InfoSec (functional equivalent to SOC) has alternate preventive measures to accomplish the goals. For audit items of 75-002 not specifically listed below, Intrado meets the comply criteria. Metric and reports are maintained audit at Intrado facilities and may be viewed in an audit process. Audit activities taking place within Intrado facilities would require prior vetting of any personnel to enter the facility. Collateral may be reviewed but must remain with the Intrado facility. Specific reports may be requested for delivery to the State, with the specific information being negotiated on award of contract.</p> <p>Audit item 27 – minimum password age of 3 days No comply. Requirement exceeded with compensating controls such as two-factor authentication.</p> <p>Audit item 28 – Maximum password age requirement 60 days No comply. Requirement exceeded with compensating controls such as two-factor authentication and account lockout after successive failed authentication attempts.</p>	MCP Responses Set 1 sed, Answer 7	Meets requirements.



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	<p>Audit item 34 – Passwords should not contain sequences of 3 or more char from user loginID No comply. Requirement exceeded with compensating controls such as two-factor authentication and password length and complexity enforcement.</p> <p>Audit item 35 – Passwords should not contain sequences of 3 or more chars from previous pw No comply. Requirement exceeded with compensating controls such as two-factor authentication and password length and complexity enforcement.</p> <p>Audit item 36 – Passwords should not contain a sequence of 2 or more characters consecutively No comply. Requirement exceeded with compensating controls such as two-factor authentication and password length and complexity enforcement.</p> <p>Audit item 96 – administrators use non-administrative accounts when performing non-administrative tasks. Partial comply. Remediation is in progress for known exceptions.</p> <p>Audit item 97 – Do all sysadmins have a personal admin acct rather than a generic one? Comply wherever possible.</p> <p>Audit item 104 – Only administrative users are assigned passwords to access and modify sensitive files/resources. No comply. Intrado uses Role-based Access Control (RBAC) – info owners are seldom administrators and there are non-administrators whose job function is to access and modify sensitive files/resources. Access and permissions would still be restricted.</p> <p>Audit item 140 – implementation and modes shall use the strongest available product No comply. Intrado makes the best product selection decision to meet security and business requirements of our</p>		



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	<p>customers, partners and established SLAs.</p> <p>Audit item 368 – Wireless SSID broadcast disabled No comply. Requirement exceeded with VPN and two-factor authentication to access internal systems.</p> <p>Audit item 369 – wireless encryption No comply. Requirement exceeded with VPN and two-factor authentication to access internal systems.</p> <p>Audit item 373 – MAC address filters No comply. Requirement exceeded with VPN and two-factor authentication to access internal systems.</p>		
End-of-Life Equipment	<p>The referenced diagram shows “AS5350” labeling of a gateway icon at the Phoenix and Tucson LNGs (far left boxes), with ingress to the box via multiple DS1s and direct connectivity into (Cisco) 3945 routers. This design leaves MCP with the understanding that the LNG gateways are Cisco AS5350 Universal Gateways. In its research, MCP found that these gateways were put on end-of-life notice in 2006, with the last date of support being December 21, 2011. This leaves MCP to believe that these could possibly be Cisco AS5350XM Universal Gateways, which are also under end-of-life notice, but with a last date of support being February 28, 2018; however, Cisco is no longer providing software maintenance support as of February 2014.</p> <p>This research elicits several areas of concern:</p> <ol style="list-style-type: none"> 1. What is the actual device providing the gateway function at the LNGs? 2. If the device is under an end-of-life notice, then does the device have a current service contract? How long until the service contract expires? 3. What is the process for introducing new hardware, software and firmware to the solution design? 4. What is the migration plan to replace these devices prior to the expiration of the service contract? 	NG911 Managed Services - Arizona Network Diagram	Meets Requirements.



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	<p>5. What other devices not labeled in the diagram are also under an end-of-life notice? If applicable, what do their service contracts and replacement schedules look like?</p> <p>Please provide answers to each of these questions.</p> <p>CenturyLink Response:</p> <p>1. What is the actual device providing the gateway function at the LNGs? >>Cisco AS5350XM</p> <p>2. If the device is under an end-of-life notice, then does the device have a current service contract? How long until the service contract expires? >>Current support contract runs through 9/29/15, which is the published end-of-support date.</p> <p>3. What is the process for introducing new hardware, software and firmware to the solution design? >>Alternative devices are introduced and tested via interoperability testing in the Intrado Lab.</p> <p>4. What is the migration plan to replace these devices prior to the expiration of the service contract? >>After devices have been tested for functionality against the pre-production instance in the Intrado Lab a project schedule will be published to get current infrastructure replaced and new models deployed to new opportunities.</p> <p>5. What devices will we use at the LNG to replace the Cisco EOL\EOS equipment in previous drawings (i.e., AS5000, 2800 series routers, etc.) >>The Gateways are open for definition as multiple devices will be tested to confirm their ability to function within the</p>		



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	<p>solution. The Cisco routers (2800's) will be replaced by the newer generation hardware that is already being installed for new deployments.</p> <p>What domain name will be used for the element in the ESiNet, or will customer have feedback on this? >>A CLLI is obtained for each functional instance at an LNG from Telcordia.</p> <p>August 25th Update: Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.</p>		
Network Design	<p>Please advise if encryption will be implemented across the network and if so, please advise what protocol(s) and network design considerations are being made to secure the data.</p> <p>CenturyLink Response: RTP is not specifically encrypted to the user; however; transport between devices over IP access clouds is encrypted using standard IPSEC (AE256) tunneling.</p>	AZ NG9-1-1 Technical Review 4-14-14, Sections 6.2, 13.5.2, 13.6.2, 13.7.5	Meets requirements.
Shared 3-Digit Bridge Lists	<p>Please confirm that the referenced section indicates that this is a future feature. If so, please provide a committed timeline for the delivery of this feature.</p> <p>CenturyLink Response: Shared 3-Digit Bridge List is a confirmed future feature, included at no additional charge, and set for mid-2015 roadmap. This functionality is contingent on each CPE providing the 3-digit dialing information to the network</p>	AZ NG9-1-1 Technical Review 4-14-14, Section 7.2 "Shared 3-Digit Bridge Lists: The ability for the call taker to use a single button on the call taker's display and transfer unit to complete either a transfer or three-way conference. These transfers utilize pre-provisioned Star Codes (*200-*999). These Star Codes will be shared among numerous PSAPs (i.e., all	Meets requirements.



Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
		PSAPs in a particular State could use the same Star Codes). In order to match the functionality that CenturyLink has deployed within its region, CenturyLink will develop this capability as part of the Product Roadmap.”	
I to I process	<p>Please define the “I to I process” as it pertains to the Program and/or Arizona PSAPs.</p> <p>CenturyLink Response: The I to I process in an Intrado internal process that does not engage the State or PSAPs. Requests for additional or customized reports, query capabilities, and graphical data display should be made through standard CenturyLink customization/change order processes.</p>	<p>AZ NG9-1-1 Technical Review 4-14-14, Section 9.9</p> <p>“Requests for additional or customized reports, query capabilities, and graphical data display should be made in accordance with the I to I process.”</p>	Meets requirements.