

CENTURYLINK® 9-1-1 AGREEMENT

This CenturyLink 9-1-1 Agreement ("Agreement") is between CenturyLink Sales Solutions, Inc., as contracting agent on behalf of the applicable CenturyLink affiliated entities providing Services ("CenturyLink") and Southeastern Arizona Communications (SEACOM) ("Customer") and is effective on the date the last party signs it ("Effective Date"). CenturyLink may withdraw this offer if Customer does not execute and deliver the Agreement to CenturyLink on or before **December 1, 2017** ("Cutoff Date"). Using CenturyLink's electronic signature process for the Agreement is acceptable.

SOUTHEASTERN ARIZONA COMMUNICATIONS

CENTURYLINK SALES SOLUTIONS, INC.

Authorized Signature

Name Typed or Printed

Title

Date

Authorized Signature

Name Typed or Printed

Title

Date

Customer's address for notices:
Customer's facsimile number (if applicable):
Person designated for notices:

1. Services. Customer may purchase the products and services ("Services") in service exhibits ("Service Exhibits") attached to the Agreement. Additional Service Exhibits will only be added to this Agreement by amendment during the Initial Term. The Service Exhibits attached to the Agreement as of the Effective Date and incorporated by this reference are shown below. Services are purchased under this Agreement at the rates and charges in effect at the time of the addition(s) by an Order Form signed by authorized representatives of both parties. All Services will be coterminous with the Agreement.

- **CENTURYLINK MANAGED NG9-1-1 ESINET BUNDLE OFFER ATTACHMENT**
- **CENTURYLINK NEXT GENERATION 9-1-1 SERVICE EXHIBIT**
- **CENTURYLINK AIRBUS HOSTED VESTA SERVICE EXHIBIT**
- **DOMESTIC CENTURYLINK IQ® NETWORKING SERVICE EXHIBIT**
- **LOCAL ACCESS SERVICE EXHIBIT**
- **DOMESTIC NETWORK DIVERSITY® SERVICES EXHIBIT**
- **CENTURYLINK® SELECT ADVANTAGE® SERVICE EXHIBIT**
- **CENTURYLINK NG9-1-1 WITH MANAGED 9-1-1 CPE SERVICE LEVEL AGREEMENTS**
- **ATTACHMENTS, EXHIBITS, SERVICE GUIDES, OR SOWS INCORPORATED INTO THE SERVICE EXHIBITS**
- **CENTURYLINK NG9-1-1 WITH MANAGED 9-1-1 CPE TECHNICAL DOCUMENT SERVICE EXHIBIT FOR STATE OF ARIZONA 9-1-1 SYSTEM**

2. Term. Customer selects the following "Initial Term" of the Agreement: 60 months; code 600055. The Agreement begins on the Effective Date and the Initial Term begins on the Start of Service Date. Renewals require a new agreement between the parties. The parties agree to negotiate a new agreement 90 days prior to the conclusion of the Term. At the end of the Initial Term, if Customer continues to use Services after the parties fail to negotiate a new Agreement, the Agreement will continue on a month to month basis ("Extension Term") until either party provides 30 calendar days' notice to terminate the Agreement and CenturyLink may increase the Service rates at the end of the Initial Term, upon at least sixty (60) calendar days prior written notice, provided that the foregoing shall not restrict any increases based on Regulatory Activity. The Initial Term and each Extension Term are referred to as the "Term."

3. Termination.

3.1 Service. Either party may terminate an individual Service that is not purchased as part of a bundled Service offering: (a) in accordance with the individual Service Exhibit's term requirements with 60 calendar days' prior written notice to the other party (or 30 calendar days notice if during the Extension Term), or (b) for Cause. If Service is terminated by Customer for Convenience or by CenturyLink for Cause, then Customer will pay Cancellation Charges. "Cancellation Charge" means the cancellation charge described in the applicable Service Exhibit and charges incurred by CenturyLink from a third party provider as a result of an early termination. "Cause" means the failure of a party to perform a material obligation under the Agreement, which failure is not remedied: (a) for payment defaults by Customer, within five days of separate written notice from CenturyLink of such default; or (b) for any other material breach, within 30 calendar days after written notice (unless a different notice period is specified in this Agreement). "Convenience" means any reason other than for Cause.

3.2 Agreement. Either party may terminate the Agreement and all Services by: (a) providing written notice to the other party of its intention not to renew the Agreement at least 60 calendar days prior to the expiration of the then current Term (or 30 calendar days notice if during the Extension Term) or (b) for Cause. Cause to terminate an individual Service Exhibit will not constitute Cause to terminate the Agreement; rather, Cause to terminate the entire Agreement for Service-related claims will exist only if Customer has Cause to terminate all or substantially all of the Services under the Service Exhibit or Tariff. If the Agreement is terminated by Customer for Convenience or by CenturyLink for Cause prior to the conclusion of the Term, then Customer will pay the total Cancellation Charges that apply for terminating all CenturyLink Services at the time the Agreement is terminated.

3.3 Unpaid Charges. Customer will remain liable for charges accrued but unpaid as of the termination date.

4. Rates and Charges.

4.1 General. Services will receive the applicable rates specified in a Bundle Offer Attachment, Service Exhibit, Attachment to a Service Exhibit, Order Form or SOW for the duration of the Initial Term. Notwithstanding anything to the contrary in a Service Exhibit, Order Form or SOW, CenturyLink may modify rates and charges after the Initial Term if the Agreement continues on a month to month basis and Customer receives Services. CenturyLink reserves the right to revise rates if Regulatory Activity affects the cost of providing Service. CenturyLink also reserves the right to modify rates after the conclusion of each Service's minimum service period upon not less than 30 calendar days' prior written notice to Customer; provided that CenturyLink may reduce the foregoing notice period or modify rates or discounts prior to the conclusion of the minimum service period, as necessary, if such modification is based upon Regulatory Activity. Provision of Service under this Agreement may involve Independent Providers. Charges for Service only include Service provided within CenturyLink Territory up to the meet point of the Independent Provider. Other charges which involve work performed by the Independent Provider will be in addition to CenturyLink's charges and will be negotiated separately between Customer and the Independent Provider. "CenturyLink Territory" means CenturyLink's local service areas in the following states: Arizona, Colorado, Idaho, Iowa, Minnesota, Montana, Nebraska, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming. "Independent Providers" means telephone companies, Incumbent Local Exchange Carriers ("ILECs"), means Competitive Local Exchange Carriers ("CLECs"), or other communications service providers, (i.e., wireless carriers and/or interconnected VoIP providers).

4.2 CPI Adjustment. The PSAP will only consider a CPI adjustment when provided a detailed quote with an adjustment amount not to exceed 2% per annum or the change in CPI, whichever is less. Further, the adjustment shall only be recognized at the end of the initial five year term and shall establish the fixed rate the next five year term.

5. Billing and Payment. CenturyLink may begin invoicing for specific Services as specified in the applicable Service Exhibit. Customer must pay CenturyLink all charges within 45 days after the invoice date. Any amount not paid when due is subject to late interest at the lesser of 0.66% per month or the maximum rate allowed by law. In addition to payment of charges for Services, Customer must also pay CenturyLink any applicable Taxes assessed in connection with Services. Taxes may vary and are subject to change. If Customer is exempt from any Tax, it must provide CenturyLink with an appropriately completed and valid Tax exemption certificate or other evidence acceptable to CenturyLink. CenturyLink is not required to issue any exemption, credit or refund of any Tax payment for usage before Customer's submission of valid evidence of exemption. "Tax" or "Taxes" means foreign, federal, state, and local excise, gross receipts, sales, use, privilege, or other tax (other than net income) now or in the future imposed by any governmental entity (whether such Taxes are assessed by a governmental authority directly upon CenturyLink or the Customer) attributable or measured by the sale price or transaction amount, or surcharges, fees, and other similar charges that are required or permitted to be assessed on the Customer. CenturyLink may reasonably modify the payment terms or require other assurance of payment based on Customer's payment history or a material and adverse change in Customer's financial condition. Customer will not pay for the Services with funds obtained through the American Recovery and Reinvestment Act (or ARRA) or other similar stimulus grants or loans that would obligate CenturyLink to provide certain information or perform certain functions unless each of those functions and obligations is explicitly identified and agreed to by the parties in this Agreement or in an amendment to this Agreement.

6. Confidentiality; Publicity. Except to the extent required by an open records act or similar law, neither party will, without the prior written consent of the other party: (a) disclose any of the terms of the Agreement or use the name or marks of the other party or its Affiliates; or (b) disclose or use (except as expressly permitted by, or required to achieve the purposes of, the Agreement) the Confidential Information of the other party. "Confidential Information" means any information that is not generally available to the public, whether of a technical, business or other nature and that: (a) the receiving party knows or has reason to know is confidential, proprietary or trade secret information of the disclosing party; and/or (b) is of such a nature that the receiving party should reasonably understand that the disclosing party desires to protect such information against unrestricted disclosure. The parties understand and agree that subscriber information may be considered to be Confidential Information under state or federal laws or regulations, and there are certain duties and responsibilities imposed by this Agreement and by law or Tariff with regard to the use and distribution of such information. Subscriber Information contains names, address and telephone numbers of telecommunication service subscribers, including published and non-listed telephone service. Confidential Information will not include information that is in the public domain through no breach of the Agreement by the receiving party or is already known or is independently developed by the receiving party. Each party will use reasonable efforts to protect the other's Confidential Information, and will use at least the same efforts to protect such Confidential Information as the party would use to protect its own. CenturyLink's consent may only be given by its Legal Department. A party may disclose Confidential Information if required to do so by a governmental agency, by operation of law, or if necessary in any proceeding to establish rights or obligations under the Agreement. CenturyLink will not be deemed to have accessed, received, or be in the possession of Customer Confidential Information solely by virtue of the fact that Customer transmits, receives, accesses or stores such information through its use of CenturyLink's Services. Confidential Information may include CenturyLink end user information that consists of names, addresses and telephone numbers of telephone service subscribers of CenturyLink and of other service providers (to the extent the information has been provided to CenturyLink for inclusion in CenturyLink's 9-1-1/E9-1-1 database), including non-published and non-listed telephone service. The parties understand that the use of CenturyLink end user information involves certain duties and responsibilities imposed by law or Tariff with regard to the use and distribution of such information. CenturyLink end user information will be provided to Customer on a call-by-call basis and will be used by Customer only for the purpose of responding to 9-1-1 emergency calls. Confidential Information will not include information that is in the public domain through no breach of this Agreement by the receiving party or is already known or is independently developed by the receiving party.

7. Limitation of Liability.

7.1 General. NEITHER PARTY, ITS AFFILIATES, AGENTS, OR CONTRACTORS WILL BE LIABLE FOR ANY INDIRECT, INCIDENTAL, SPECIAL, RELIANCE, PUNITIVE, OR CONSEQUENTIAL DAMAGES OR FOR ANY LOST PROFITS OR REVENUES OR LOST DATA OR COSTS OF COVER RELATING TO THE SERVICE OR THE AGREEMENT, REGARDLESS OF THE LEGAL THEORY UNDER WHICH SUCH LIABILITY IS ASSERTED WITH REGARD TO ANY SERVICE RELATED CLAIM BY CUSTOMER FOR DAMAGES THAT IS NOT LIMITED BY THE PRECEDING SENTENCE, CUSTOMER'S EXCLUSIVE REMEDIES FOR SUCH CLAIM WILL NOT EXCEED THE TOTAL MRCs OR USAGE CHARGES PAID BY CUSTOMER TO CENTURYLINK FOR THE AFFECTED SERVICE IN THE ONE MONTH IMMEDIATELY PRECEDING THE OCCURRENCE OF THE EVENT GIVING RISE TO THE CLAIM. CENTURYLINK'S LIABILITY FOR ANY LOSS OR DAMAGE ARISING FROM ERRORS, INTERRUPTIONS, DEFECTS, FAILURES, OR MALFUNCTIONS OF THIS SERVICE OR ANY PART THEREOF CAUSED BY THE NEGLIGENCE OF CENTURYLINK WILL NOT EXCEED THE GREATER OF \$50.00 OR AN AMOUNT EQUIVALENT TO THE PRO RATA CHARGES FOR THE SERVICE AFFECTED DURING THE PERIOD OF TIME THAT THE SERVICE WAS FULLY OR PARTIALLY INOPERATIVE. This limitation of liability will not apply to Customer's payment obligation for charges under the Agreement, (e.g., Service charges, Taxes, interest, and Cancellation Charges). IN ADDITION, CENTURYLINK WILL NOT BE LIABLE FOR ANY DAMAGE THAT RESULTS FROM INFORMATION PROVIDED TO CUSTOMER BY ANY OTHER DATA PROVIDER(S).

7.2 Personal Injury; Death; Property Damages. CENTURYLINK, ITS AFFILIATES, AGENTS AND CONTRACTORS (INCLUDING WITHOUT LIMITATION, ANY SERVICE PROVIDER PROVIDING SERVICES ASSOCIATED WITH ACCESS TO 911 EMERGENCY SERVICE) WILL NOT HAVE ANY LIABILITY WHATSOEVER FOR ANY PERSONAL INJURY TO OR DEATH OF ANY PERSON, FOR ANY LOSS, DAMAGE OR DESTRUCTION OF ANY PROPERTY RELATING TO THE USE, LACK OF ACCESS TO OR PROVISION OF, 911 EMERGENCY SERVICE.

8. No Warranties. CENTURYLINK DISCLAIMS ALL EXPRESS OR IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, WARRANTIES OF TITLE, NONINFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. NO ADVICE OR INFORMATION GIVEN BY CENTURYLINK, ITS AFFILIATES, AGENTS, OR CONTRACTORS OR THEIR RESPECTIVE EMPLOYEES WILL CREATE ANY WARRANTY. NO GUARANTEES ARE PROVIDED FOR THIS SERVICE. CUSTOMER ASSUMES TOTAL RESPONSIBILITY FOR USE OF THE SERVICE. IF CENTURYLINK INTEGRATES ANY RECORDS PROVIDED TO CENTURYLINK BY ANY OTHER DATA PROVIDER, FOR INCLUSION IN THE CUSTOMER'S 9-1-1 DATA, CENTURYLINK MAKES NO REPRESENTATION OR WARRANTY AND ASSUMES NO LIABILITY REGARDING THE ACCURACY OF THE DATA PROVIDED BY ANY OTHER DATA PROVIDER. IN ADDITION TO ANY OTHER DISCLAIMERS OF WARRANTY STATED IN THE AGREEMENT, CENTURYLINK MAKES NO WARRANTY, GUARANTEE, OR REPRESENTATION, EXPRESS OR IMPLIED, THAT ALL SECURITY THREATS AND VULNERABILITIES WILL BE DETECTED OR THAT THE PERFORMANCE OF THE SERVICES WILL RENDER CUSTOMER'S SYSTEMS INVULNERABLE TO SECURITY BREACHES, OR THAT THE SERVICES WILL BE PROVIDED ERROR-FREE.

9. Non-Appropriations. Customer intends to continue this Agreement for its entire Term and to satisfy its obligations hereunder. For each fiscal period for Customer: (a) Customer agrees to include in its budget request appropriations sufficient to cover Customer's obligations under this Agreement; (b) Customer agrees to use all reasonable and lawful means to secure these appropriations; (c) Customer agrees it will not use non-appropriations as a means of terminating this Agreement in order to acquire functionally equivalent products or services from a third party. Customer reasonably believes that sufficient funds to discharge its obligations can and will lawfully be appropriated and made available for this purpose. In the event that Customer is appropriated insufficient funds, by appropriation, appropriation limitation or grant, to continue payments under this Agreement and has no other funding source lawfully available to it for such purpose (as evidenced by notarized documents provided by Customer and agreed to by CenturyLink), Customer may terminate this Agreement without incurring termination charges by giving CenturyLink not less than 30 days' prior written notice. Upon termination and to the extent of lawfully available funds, Customer will remit all amounts due and all costs reasonably incurred by CenturyLink through the date of termination.

10. Governing Law; Dispute Resolution.

10.1 Billing Disputes. If Customer disputes a charge in good faith, Customer may withhold payment of that charge if Customer makes timely payment of all undisputed charges when due and provides CenturyLink with a written explanation of the reasons for Customer's dispute of the charge within 90 days after the invoice date of such amount. If CenturyLink determines, in its good faith, that the disputed charge is valid, CenturyLink will notify Customer and within five business days after CenturyLink's notification, Customer must pay the charge and accrued interest.

10.2 Governing Law; Forum. The Agreement will be governed by the laws of the State in which the Customer's principal office is located without regard to its choice of law principles. Any legal proceeding relating to this Agreement will be brought in a U.S. District Court, or absent federal jurisdiction, in a state court of competent jurisdiction, in the location of the party to this Agreement not initiating the action, as indicated in the Notices section. CenturyLink may, at its discretion, initiate proceedings in Denver, Colorado to collect undisputed amounts billed. This provision is not intended to deprive a small claims court or state agency of lawful jurisdiction that would otherwise exist over a claim or controversy between the parties. "State" means one of the 50 states of the United States or the District of Columbia.

10.3 Waiver of Jury Trial and Class Action. Each party, to the extent permitted by law, knowingly, voluntarily, and intentionally waives its right to a jury trial and any right to pursue any claim or action relating to this Agreement on a class or consolidated basis or in a representative capacity.

10.4 Limitations Period. Any claim relating to the Agreement must be brought within two years after the claim arises other than Customer disputing an amount in an invoice, which must be done by Customer within 90 days after the invoice date of the disputed amount.

11. HIPAA. CenturyLink does not require or intend to access Customer data in its performance hereunder, including but not limited to

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any confidential health related information of Customer's clients, which may include group health plans, that constitutes Protected Health Information ("PHI"), as defined in 45 C.F. R. §160.103 under the Health Insurance Portability and Accountability Act of 1996 ("HIPAA Rules"). To the extent that any exposure to PHI is incidental to CenturyLink's provision of Service and not meant for the purpose of accessing, managing the PHI or creating or manipulating the PHI, such exposure is allowable under 45 CFR 164.502(a)(1)(iii).

12. Notices.

12.1 Legal Notices. All Legal notices to CenturyLink must be in writing, sent to 1801 California St., #900, Denver, CO 80202; Fax#: 888-778-0054; Attn.: Legal Department, and to Customer at its then current address as reflected in CenturyLink's records; Attn.: General Counsel or other person designated for notices. Unless otherwise provided herein, all notices will be deemed given: (a) when delivered in person to the recipient named above; (b) three business days after mailed via regular U.S. Mail; (c) when delivered via overnight courier mail; or (d) when delivered by fax if duplicate notice is also sent by regular U.S. Mail.

12.2 Termination Notices. Customer's notice of termination for Services must be sent via mail, facsimile or e-mail to Carlos Simmonds, 20 E. Thomas Rd., Phoenix, AZ 85012; e-mail: carlos.simmonds@centurylink.com; Fax#: 602-279-5250, and mail or fax a copy to the Legal Department, as outlined in 12.1 above. Such termination is effective 30 calendar days after CenturyLink's receipt of the notice, unless a longer period is otherwise required.

13. Installation, Maintenance and Repair. Provision of Services is subject to availability of adequate capacity and CenturyLink's acceptance of a complete Order Form. Customer will reasonably cooperate with CenturyLink or its agents to install, maintain, and repair Services. Customer will provide or secure at Customer's expense appropriate space and power; and rights or licenses if CenturyLink must access the building of Customer's premises to install, operate, or maintain Service or associated CenturyLink equipment. CenturyLink may refuse to install, maintain, or repair Services if any condition on Customer's premises is unsafe or likely to cause injury. Customer is responsible for any facility or equipment repairs on Customer's side of the demarcation point. Customer may request a technician dispatch for Service problems. CenturyLink will assess a dispatch fee if it determines the problem is on Customer's side of the demarcation point or was not caused by CenturyLink's facilities or equipment on CenturyLink's side of the demarcation point.

14. General. Customer may not assign the Agreement or any of its rights or obligations under the Agreement without the prior written consent of CenturyLink, which consent will not be unreasonably withheld. Customer may not assign to a reseller or a telecommunications carrier under any circumstances. Customer represents that it is not a reseller of any telecommunication services provided under this Agreement as described in the Telecommunications Act of 1996, as amended or applicable state law and acknowledges it is not entitled to any reseller discounts under any laws. Customer's use of Service must comply with all applicable laws. CenturyLink may change features or functions of its Services; for material changes, CenturyLink will provide 30 calendar days prior written notice, but may provide a different notice period if the change is based upon Regulatory Activity or Tariff provisions. The Agreement is intended solely for CenturyLink and Customer and not to benefit any other person or entity. If any term of the Agreement is held unenforceable, such term will be construed as nearly as possible to reflect the original intent of the parties and the remaining terms will remain in effect. Neither party's failure to insist upon strict performance of any provision of the Agreement will be construed as a waiver of any of its rights hereunder. All terms of the Agreement that should by their nature survive the termination of the Agreement will so survive. In the event of a conflict in any term or condition of any documents that govern the provision of the Service hereunder, the following order of precedence will apply in descending order of control: Bundle Offer Attachment, Service Exhibit, the Agreement, Order Form, SOW and CenturyLink records. If Services are provided pursuant to a Tariff as described in the applicable Service Exhibit, the order of precedence will apply in the following descending order of control: Tariff, Service Exhibit, the Agreement, Order Form, SOW and CenturyLink records. Neither party will be liable for any delay or failure to perform its obligations hereunder if such delay or failure is caused by a Force Majeure Event. "Force Majeure Event" means an unforeseeable event beyond the reasonable control of that party, including without limitation: act of God, fire, explosion, lightning, hurricane, labor dispute, cable cuts by third parties, acts of terror, material shortages or unavailability, government laws or regulations, war or civil disorder, or failures of suppliers of goods and services. Except Service modifications initiated by CenturyLink, all amendments to the Agreement must be in writing and signed by the parties' authorized representatives. However, any change in rates, charges, or regulations mandated by the legally constituted authorities will act as a modification of any contract to that extent without further notice. CenturyLink provides the Services as an independent contractor. The Agreement will not create an employer-employee relationship, association, joint venture, partnership, or other form of legal entity or business enterprise between the parties, their agents, employees or affiliates.

15. Definitions.

"Affiliate" means any entity controlled by, controlling, or under common control with a party.

"MRC" means monthly recurring charge.

"NRC" means nonrecurring charge.

"Order Form" includes both order request forms and quotes issued by CenturyLink. If a CenturyLink service requires a quote to validate the Order Form pricing, the quote will take precedence over the order request form, but not over the Service Exhibit.

"Regulatory Activity" is a regulation or ruling by any regulatory agency, legislative body or court of competent jurisdiction, including, but not limited to, Federal Communication Commission, or State public utility commission, rules, regulations, or requirements, applicable to 9-1-1 Service Providers that increase the costs to provide services to Customers.

"SOW" means a statement of work attached hereto or referenced in this Agreement.

"Start of Service Date" means the date CenturyLink notifies Customer that a Managed ESnet Bundle to be provided under this Agreement is provisioned and ready for use by Customer. The parties will document the Start of Service Date by the Customer issuing a "Certificate of Start of Service" in the form attached to this Agreement.

"Tariff" includes as applicable: CenturyLink state tariffs, price lists, price schedules, administrative guidelines, catalogs, and rate and

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term schedules incorporated by this reference and posted at <http://www.centurylink.com/tariffs>.

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CENTURYLINK MANAGED NG9-1-1 ESINET BUNDLE OFFER ATTACHMENT

This CenturyLink Managed NG9-1-1 ESInet Bundle offer attachment ("Attachment") is subject in all respects to CenturyLink

9-1-1 Agreement ("Agreement") and applicable Service Exhibits between Customer and CenturyLink, all of which must be executed between the parties for the offer in this Attachment to apply. All capitalized terms that are used but not defined in this Attachment are defined in the Agreement or other Service Exhibit.

1. Scope. Customer may purchase the Managed NG9-1-1 ESInet solution ("Managed ESInet Bundle") under this Attachment. "Managed ESInet Bundle" is a combination of the CenturyLink Next Generation ("NG") 9-1-1 Service, CenturyLink MPLS IQ Private Port, Local Access Service, Managed VESTA Call Handling Service, Statements of Work and Service Guides.

2. Eligibility and Restrictions. Customer will receive all of the applicable Service elements in the Managed ESInet Bundle by placing an Order for a 60 month Term, with the Term commencing on the Start of Service Date. The following subsections of Section 2 describe what is included and excluded from the Managed ESInet Bundle.

2.1. CenturyLink Next Generation (Next Gen) 9-1-1 Routing Service. "Next Gen 9-1-1 Routing Service" means a specialized managed network for processing 9-1-1 calls from both traditional voice and non-traditional voice and data networks, as further described on the CenturyLink Next Generation 9-1-1 Service Exhibit to the Agreement. The Next Gen 9-1-1 Routing Service for the Managed ESInet Bundle includes Location Data Management, 9-1-1 Routing, and i3 Routing enabled by the i3 functional elements described in Section 10.6 of the CenturyLink NG9-1-1 with Managed 9-1-1 CPE Technical Document. Next Generation 9-1-1 Routing Service requires the input of selective routing database (SRDB) updates from the database management system. The Next Generation i3 Routing Service requires the input of geospatial data from the Emergency Call Routing Function (ECRF) and routing rules from the Policy Routing Function (PRF).

2.2 IQ MPLS Private Ports and Local Access. CenturyLink will provide IQ MPLS Private Ports and Local Access (as described on Service Exhibits to this Agreement, and collectively "IP Connectivity") between the Next Gen 9-1-1 Routing Service and the Customer's location. All equipment related to IP Connectivity and deployed at the Customer location to support Managed ESInet Bundle will be owned and supplied by CenturyLink during the Term of the Agreement. The IP Connectivity will meet the following requirements:

- QoS IP "Backbone Prioritization" to allow the management of the prioritization of 9-1-1 voice/data/OAM network traffic.
- Industry standard P.01 grade of service. CenturyLink will apply the P.01 standard over the supplied IP Connectivity.
- CenturyLink will provide card level mapping when orders for circuits are placed. CenturyLink will use commercially reasonable efforts to disclose any single points of failure that may exist in the IP Connectivity due to network convergence for IP Connectivity.
- Monitor and Notification. CenturyLink will monitor MPLS IQ Private Port devices 24x7x365 for up/down status and notify Customer of faults.
- Local Access Services is included, however, Local Access Services will not be provided on a redundant or diverse basis unless expressly stated in this Agreement or an Order for Service.
- IP Connectivity bandwidth for Customer will be provided to be sufficient for purposes of managing the data transport needs of customer based on the then existing Managed ESInet Bundle.
- If Customer desires to purchase additional or upgrade applications or services, CenturyLink may require that Customer purchase additional IP Connectivity in order to meet bandwidth requirements for the new applications or services.
- In certain instances, limitations of existing Local Access facilities may require upgrades to facilities into Customer's location in order to accommodate additional bandwidth. CenturyLink may require that Customer pay non-recurring special construction charges in order to upgrade facilities into Customer's location.

2.3 Managed VESTA Call Handling Service. The Managed VESTA Call Handling Service manages the call processing and delivery of 9-1-1 calls and ALI/ANI information to a call taker position at the Customer location in conjunction with the other Managed ESInet Bundle Services, as described on the CenturyLink Airbus Hosted Vesta Service Exhibit. The Managed VESTA Call Handling Service includes Airbus VESTA Call Handling equipment in a hosted environment, and managing core software including:

- VESTA 9-1-1 Call Handling
- VESTA Analytics MIS
- VESTA Locate Mapping
- DataSync Map Updates
- HP workstations at the PSAP

The Managed VESTA Call Handling Service will be provided during the Term that Customer purchases the Managed ESInet Bundle. CenturyLink or its vendors own all of the equipment and software related to the Managed VESTA Call Handling Service and only provides the services to customer on a licensed basis. Additional services may be provided subject to Statements of Work or Service Guides referenced in the CenturyLink Airbus Hosted Vesta Service Exhibit.

The following features and functionality being purchased by Customer as of the Effective Date of this Agreement are listed in Section 2 of the CenturyLink Airbus Hosted Vesta Service Exhibit. This Managed ESInet Bundle, as currently designed, will only deliver voice 9-1-

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1 requests for assistance from Wireline, Wireless, and VoIP telephone devices. Future functionality, such as, the delivery of pictures and video (Media Services) are not included. Text-to 911 may be available through a separate agreement, subject to CenturyLink approval. Any other services not explicitly defined in this agreement are not available.

2.4 Network Diversity Services. The following Network Diversity Services, as more fully described on the Domestic Network Diversity Service Exhibit, are included in the Managed ESInet Bundle:

- Domestic Private Line Diversity Service. Diverse IQ MPLS Private Port connectivity, subject to the availability of existing facilities.
- Optical Wavelength Diversity Service
- Networking Diversity Service

Local Access Diversity Service is included if Customer already has diverse Local Access Services into the Customer location as of the Effective Date of the Agreement. If Local Access Diversity Service does not currently exist at the Customer location, it may be available for Customer, subject to additional charges, including, but not limited to, special construction charges. In some instances, the Local Access Diversity Service may share common network facilities, infrastructure, or buildings with the primary circuit.

2.5 Service Level Agreements. The document CenturyLink NG9-1-1 with Managed 9-1-1 CPE Service Level Agreements, October 2, 2015 (the "Service Level Agreements") is attached to the Agreement and incorporated by reference. The Service Level Agreements state the goals for CenturyLink to provide and manage the Services that make up the Managed ESInet Bundle. For purposes of the Managed ESInet Bundle, the Service Level Agreements apply instead of any standard service level agreements or other SLAs that are referenced in any Service Exhibit to the Agreement for Services that are part of the Managed ESInet Bundle.

2.6 Security. CenturyLink will take commercially reasonable efforts to protect the Services that compromise the Managed ESInet Bundle from security threats, however, because the Services, and certain monitoring features, utilize Internet protocols, CenturyLink makes no express or implied warranty that the Services will be protected from malicious attacks, including but not limited to, denial of service attacks, trojans, viruses, worms and that other malicious attacks will never reach Customer's Services. The Managed ESInet Bundle does not include security analytics, penetration testing, compliance, mitigation or remediation unless Customer elects to purchase additional services separately, which may be available from CenturyLink subject to CenturyLink approval.

2.7 Upgrade. During a Service Term, Customer may upgrade its Managed ESInet Bundle ("Upgrade"), if upgrade features, functionality, or other portions of the bundle are made available by CenturyLink. An Upgrade of one portion of the Managed ESInet Bundle may require upgrades of other aspects of the bundle. CenturyLink is not required to provide any upgrades in features or functionality during the term of this Agreement, except as expressly stated in this Agreement. CenturyLink may require a revised Term with any potential Upgrades.

3. Pricing. Customer will pay the rates set forth in a quote or, if applicable, as set forth in Addendum A. A Managed ESInet Bundle quote is a service order request submitted on a form issued by CenturyLink and signed by Customer that includes the type and details of the specific Managed ESInet Bundle ordered by Customer. CenturyLink will not waive any Local Access ancillary charges, including Construction charges, as applicable. Quotes will be governed by the terms and conditions set forth in the Agreement, the applicable Service Exhibits and this Offer Attachment.

3.1 If Customer wishes to order a new Managed ESInet Bundle or modify an existing Managed ESInet Bundle as an Upgrade, Customer and CenturyLink must enter into a separate written amendment to this Agreement.

3.2 Managed ESInet Bundle Pricing. The Managed ESInet Bundle Port MRC includes the MRCs for the Managed ESInet Bundle Port that is provided as a Service during the Term. CenturyLink will waive End-to-End Performance Reporting MRCs. The Managed ESInet Bundle pricing is exclusive of, and may not be combined with any other current offers, promotions, or discounts that may apply to any portion of the bundle. After the Service Term for a Managed ESInet Bundle expires, CenturyLink may modify pricing for the Managed ESInet Bundle. Upgrades and additional Managed ESInet Bundle orders after an initial order may be subject to then-current Managed ESInet Bundle pricing or negotiated between the parties thru an amendment. Additional Services that are described in this Agreement but not included in the Managed ESInet Bundle may be purchased by Customer separately by a separate Order or by an amendment to this Agreement.

3.3 Local Access Pricing. Local Access rates (not included in the Bundle) are in a quote, if available.

3.4 Upgrade NRC. Customer must be required to pay applicable NRC's for any Upgrade.

4. Term; Cancellation.

4.1 Term. The term of an individual Managed ESInet Bundle begins on the Start of Service Date and will continue for the number of months as specified in Customer's order for a Managed ESInet Bundle ("Service Term"), per individual PSAP location. The Service Term is indicated in the quote or the pricing table in Addendum A.

4.2 In the event Customer informs CenturyLink that it is unable or unwilling to accept Service at the Start of Service Date, the subject Service will be held available for Customer for a period not to exceed 30 business days from such date ("Grace Period"). If after

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the Grace Period, Customer still has not accepted Service, CenturyLink may either: (a) commence with regular monthly billing for the subject Service; or (b) cancel the subject Service. If Customer cancels an order for Service prior to the date the Service is available for use, or is unable to accept the Service during the Grace Period and CenturyLink cancels the Service at the end of the Grace Period, termination charges may apply.

4.3 Customer and CenturyLink agree to begin discussions regarding the renewal or discontinuation of Service 90 days before expiration of the Agreement. Renewals will require a new Agreement.

4.4 Customer may enter into a new service agreement upon agreement of CenturyLink that establishes a greater available term period for the Managed ESInet Bundle without incurring non-recurring or termination charges.

4.5 Cancellation. Upon cancellation of a Managed ESInet Bundle, Customer will remain liable for charges accrued but unpaid as of the cancellation date. If a Managed ESInet Bundle is canceled by Customer other than for Cause, or by CenturyLink for Cause, before the conclusion of its Service Term, Customer will pay: (a) a Managed ESInet Bundle Cancellation Charge equal to: (i) 100% of the Managed ESInet Bundle's MRC multiplied by (1) the number of 9-1-1 Call Taker Positions, and (2) the number of months remaining in the initial 60 months of the Service Term, if any; plus the Local Access Cancellation Charges set forth in the Local Access Service Exhibit. If at the time that Customer terminates 9-1-1 Call Taker Positions, CenturyLink and another PSAP execute an amendment to add the same number of 9-1-1 Call Taker Positions to the other PSAP's agreement with CenturyLink, CenturyLink will, in good faith, waive the Cancellation Charges, subject to reasonable move charges and the parties reaching a mutually acceptable amendment, which may include an extension of the term of the Agreement with the surviving PSAP. In all instances, any applicable Local Access Cancellation Charges will apply.

5. Miscellaneous. All other terms not specifically set forth in this Attachment, including without limitation, any other rate elements, are as stated in the Agreement and Service Exhibits and will remain in effect. The Managed ESInet Bundle Pricing will become effective as soon as practicable, but in no event later than the second full billing cycle following the Agreement or Amendment Effective Date. If there is a conflict between any of the following documents, the order of control is: this Bundle Offer Attachment, the Service Exhibits, and the Agreement. This Attachment and the Agreement set forth the entire understanding between the parties as to the subject matter herein and supersede any prior written or verbal statements, representations, and agreements concerning the subject matter hereof.

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ADDENDUM A
CENTURYLINK MANAGED NG9-1-1 ESINET BUNDLE PRICING

1. Monthly Recurring Charges; Non-Recurring Charges.

1.1 Customer will pay the rates for all Service monthly recurring rate elements (“MRC”) as shown below or as otherwise chargeable, as applicable. The amounts stated below are exclusive of Taxes, which will be separately invoiced, as applicable, for any sub-elements of the MRC, including any applicable Arizona Transaction Privilege Tax. The MRC applies to each 9-1-1 call taker position for each Customer location (“9-1-1 Call Taker Position”).

Description	Monthly Recurring Charge (MRC)	Nonrecurring Charge (NRC)
ALI, i3 Core components, IP Selective Routing and IP Transport Services (NG91-1 ESInet Service)*	\$800 per 9-1-1 Call Taker Position	\$0
Hosted Vesta Call Handling Service	\$1200 per 9-1-1 Call Taker Position	\$10,727 per Customer location

1.2 Implementation Non-Recurring Charge. In addition to the MRC and NRC amounts above, upon receipt of Customer’s Order for the Managed ESInet Bundle, CenturyLink will invoice Customer a non-recurring charge (“Implementation NRC”) in the amount of \$0.00 provided the Implementation NRC has been previously satisfied under separate Agreement in Arizona. The Implementation NRC will be subject to Taxes as separately stated on the invoice, including Arizona Transaction Privilege Tax. Customer will pay the Implementation NRC, and applicable Taxes, within 60 calendar days of the invoice date. After the Start of Service Date, the Implementation NRC will become non-refundable. CenturyLink may offer the Managed ESInet Bundle to other Customers that may pay a different, reduced, or no Implementation NRC.

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Qwest Corporation d/b/a CenturyLink QC ("CenturyLink") provides Next Generation 9-1-1 Services under the terms of this Service Exhibit. Customer represents that it is a PSAP, or an authorized agent of one or more PSAPs, and that it is authorized to subscribe to the Service and respond to public emergency calls.

1. Definitions.

"Agreement" means the agreement between Customer and CenturyLink that this Service Exhibit is attached to and incorporated by reference.

"ALI" means Automatic Location Identification.

"CLEC" means Competitive Local Exchange Carrier.

"Data Transport" means traditional E9-1-1 circuits used to deliver the ALI to the PSAP that are provided under the terms of a CenturyLink tariff, price list, price schedule, administrative guideline, catalog, and other rate and term schedules (hereinafter, whether individually or together, "Tariff"). Data Transport is not offered under this Service Exhibit.

"Independent Providers" means telephone companies, ILECs, CLECs, or other communications service providers, (i.e., wireless carriers and/or interconnected VoIP providers).

"ILEC" means Incumbent Local Exchange Carrier.

"IP" means Internet Protocol.

"MSAG" means Master Street Address Guide.

"NENA" means National Emergency Number Association.

"PSAP" means Public Safety Answering Point which is a communications facility operated on a 24-hour basis that is assigned the responsibility to receive 9-1-1 calls and, as appropriate, notifies or dispatches public or private safety services or extends, transfers, or relays 9-1-1 calls to an appropriate public or private safety agency.

A PSAP is an agency or party authorized to receive and respond to emergency calls.

"CenturyLink Territory" means CenturyLink's local service areas in the following states: Arizona, Colorado, Idaho, Iowa, Minnesota, Montana, Nebraska, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming.

"SOW" means a statement of work attached hereto or referenced in this Service Exhibit.

2. Service Description.

2.1 CenturyLink will provide, and Customer will purchase, the CenturyLink Next Generation ("NG") 9-1-1 service provided under this Service Exhibit ("Service" or "NG 9-1-1 Service"). Service enables the routing of 9-1-1 dialed calls to a Customer-designated PSAP over an IP network. Service is provided as described in this Service Exhibit and in a SOW or Service Guide, if applicable. In the event of a conflict between the terms of any SOW or Service Guide and the terms of this Service Exhibit, the terms of this Service Exhibit will control. The number "9-1-1" is intended as a universal emergency telephone number that provides the public direct access to a PSAP. A PSAP is an agency authorized to receive and respond to emergency calls. PSAPs are designated by the Customer and specified in Attachment(s) to this Service Exhibit. Service includes components necessary for the answering, transferring, and forced disconnect of emergency 9-1-1 calls originated by persons within the servicing area(s). CenturyLink does not answer and forward 9-1-1 calls, but furnishes the use of its facilities to enable the Customer's NG 9-1-1 and/or 9-1-1 personnel to respond to such calls. PSAP information, service locations, and addresses are shown on Attachment 1, incorporated by reference into this Service Exhibit. By checking the box below, the applicable Service Guide is incorporated into this Service Exhibit. Service Guides that are not specifically incorporated will not be considered part of this Service Exhibit.

Service Guide(s) are hereby incorporated into this Service Exhibit.

- **CenturyLink / West A9-1-1 Service Guide – Routing**
- **CenturyLink / West A9-1-1 Service Guide – Location Data Management**

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2.2 CenturyLink will not provide Service to less than an entire central office service area. Service does not include facilities provided by Independent Providers.

2.3 Customer will use the NG 9-1-1 Service only for receiving and responding to requests for emergency assistance. Customer will be responsible for ensuring the PSAP will also use the NG 9-1-1 Service as prescribed herein. Any other use of the database will result in immediate termination of Service.

2.4 CENTURYLINK ACCEPTS NO RESPONSIBILITY FOR OBTAINING OR FOR THE ACCURACY OF SUBSCRIBER, STATION, OR END-USER RECORD INFORMATION RECEIVED FROM INDEPENDENT TELEPHONE COMPANIES, CLECS, OR PRIVATE TELECOMMUNICATIONS SYSTEMS, SUCH AS PBX OR SHARED TENANT SERVICES.

2.5 Customer will provide an MSAG to CenturyLink for use in the database preparation. The MSAG must follow the NENA recommended United States Postal Service street name and directional addressing standard. Customer will ensure that each participating telephone service provider's records are sent electronically in the NENA format for database updates as specified by CenturyLink. CenturyLink will not deliver Service until each participating telephone service provider's records for Customer's service area match the applicable Master Street Address Guide at a rates shown below. Customer is fully responsible for correcting all erroneous records and achieving such rate.

State	Rate
Minnesota	98%
Washington	97%
Oregon	97%
New Mexico	96%
Other (within CenturyLink's 14 state territory)	98%

2.6 Customer must promptly notify CenturyLink if Customer believes that the Service is not functioning properly.

2.7 CenturyLink will perform inspection and/or monitoring of its facilities on a routine basis, to discover errors, defects and malfunctions that might affect the Service. Customer understands and acknowledges that this inspection and monitoring may not detect all errors that may occur. Some Service-related issues may arise that impact and delay or prevent call delivery. Some Service-related issues may occur which the system will not recognize and will therefore not cause an automatic rerouting of calls to an alternate destination. Customer may authorize CenturyLink to manually implement an alternate call route as required.

3. Term.

3.1 The term of this Service Exhibit will expire upon the termination of any Order under the Agreement for the Managed ESInet Bundle, as defined in the CenturyLink Managed NG9-1-1 ESInet Bundle Offer Attachment to the Agreement.

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ATTACHMENT 1

PSAP INFORMATION:

SERVICE LOCATION:

BILLING NUMBER:

The central offices and Customer PSAP locations included in this Attachment are as follows:

Central Offices:

<u>CENTURYLINK CENTRAL OFFICE</u>	<u>NXX</u>	<u>INDEPENDENT TELEPHONE</u>	<u>COMPANY AND/OR CLEC CENTRAL OFFICES</u>	<u>NXX</u>
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Central Office Addresses:

PSAPs:

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1. INTRODUCTION

A9-1-1® Routing Service (“Service”) is a fully managed solution offering emergency call delivery over a managed Internet Protocol (“IP”) network. The Service includes the following:

- West’s ESInet, provided by CenturyLink, provides a multi-layer redundant IP network architecture for high system availability.
- A9-1-1 Routing provides routing of 9-1-1 calls from both traditional and next generation voice networks.

2. RESPONSIBILITY MATRIX

The following matrix outlines the typical responsibilities of each party (CenturyLink, West and CUSTOMER) for the implementation and ongoing provision of the Service. Where all parties have been listed, additional detail on the responsibilities of each party is included in the Sections below.

Task	Responsibility
Project Implementation	
Project Management	West/CenturyLink
TSP Communications	West
TSP Integration Architecture	West
Develop West Methods and Procedures	West
A9-1-1 Service System Architecture	West
PSAP Facilities	CUSTOMER
PSAP Facility Site Preparation (floor space, power, etc.)	CUSTOMER
PSAP Facility Site Survey	West
PSAP Configurations/Lists - Routing, Transfer, etc.	CenturyLink/West
A9-1-1 Routing Selective Router Database (“SRDB”) Data	West
Non-West PSAP Equipment Note: This may be legacy equipment or new equipment purchased under another CUSTOMER agreement and or non-West PSAP equipment, such as CAD system, voice recording equipment, and radio system; if applicable.	CUSTOMER
Training on Service	West
End to End Testing of Service Prior to Production	West/CenturyLink
Final Data Load into SRDB	West/TSP
Develop Plan and Execute Migration Testing	West/CenturyLink
Production Turn-up of Service	West/CenturyLink
Ongoing Responsibilities	
A9-1-1 Routing Application and System Upgrades	West
A9-1-1 Routing Log storage and Backups	West
A9-1-1 Routing Metrics	West
A9-1-1 Routing Network and System Maintenance	West

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Task	Responsibility
A9-1-1 Routing Network and System Monitoring	West
Maintain West Methods and Procedures	West
Problem Reporting, Triage and Resolution	West/CenturyLink
TSP Communications	West

Table 1: Responsibility Matrix

3. PROJECT IMPLEMENTATION

3.1 Overview

CenturyLink and West's Solution Delivery approach to plan, configure, network engineer, implement, test, document, train, and support West Advanced 9-1-1 Service follows west's Solution Delivery methodology. The lifecycle begins with solution definition and architecture activities. During these initial phases, the joint CenturyLink and West team members verify system application and implementation requirements, refine the solution architecture, and finalize the plan for solution deployment. Following definition and architecture phases, the West team orders, installs, configures, tests, and trains users on CUSTOMER-facing solution components as part of solution integration and deployment effort. Following successful deployment, the maintenance phase begins. The primary goal of the lifecycle methodology is that the project aligns with overall CUSTOMER expectations, and is tailored to fit the needs of CUSTOMER. The Project Plan phases are described below.

Solution Definition

The first phase in the solution lifecycle is the Solution Definition phase, which begins with the kickoff and alignment process. During this process, key members of the joint project team unite to identify roles, responsibilities, critical success factors, project challenges, elaborate on specific strategies and project options, confirm E9-1-1 project scope, and finalize plans to expedite solution delivery plans and resources. The proposed solution is reviewed in order to align each primary stakeholder with a common vision and strategy for unified team design and planning.

Solution Architecture

During the Solution Architecture phase, the detailed solution design is finalized based on confirmed requirements. During this phase, the team analyzes the current systems, operations, and operational procedures, identifies the human factors needs, considers implementation options, and with the CUSTOMER, commits the detailed solution design and implementation schedule.

Stakeholder participation to identify processes and standard operating impact is critical in this process to support a successful integration of the new system. Current procedures, connectivity, and routing policies are examined so that the appropriate practices are carried forward to the new system environment. Examples of important areas considered include load balancing philosophies and default routing rules.

Initial planning for connectivity from the telephone service providers to the Points of Interconnection ("POI") also begins in the architecture phase. Key solution architecture planning activities include:

- Detailed solution design and schematics (onsite, site to site, site to West, firewalls, routers, etc.)
- IP specifications
- Telephone service provider connectivity specifications
- Physical requirements (e.g., equipment room design, floor loading)
- Call transfer requirements
- Training plan and schedule
- Refined project plan and timeline

Solution Integration

During the Solution Integration phase, the components of the solution, including processes, applications, servers, network components, and data flow, are ordered, engineered and readied for deployment. All network, regional, data center, and CUSTOMER premises components are delivered, and the equipment rooms and other facilities are readied.

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Coordination with wireline, wireless, and VoIP telephone service providers is an essential part of this stage to plan for the Service management transition. Telephone service providers receive all necessary information and detail to obtain connectivity to the West systems and the service provider's connectivity to the POIs is engineered and ordered.

Working closely with the CUSTOMER and stakeholder groups, the project team designs customized provisioning plans (including incoming trunk route plans, bridge lists, and dialing plans). Additionally, the documentation and training developers customize the user and process documents and various training courseware, if needed, to meet the needs of the CUSTOMER.

Solution Deployment

During the Solution Deployment phase, all network components and equipment connectivity is validated and acceptance tests are performed, metrics tracking, reporting is initiated, and training is provided. After complete non-live call testing, the system begins supporting live 9-1-1 traffic.

In preparation for deployment and in partnership with CenturyLink, the West Project Manager finalizes the cutover plan, including procedures for notification concerning schedule specifics.

Prior to the commencement of cutover, the project team members will hold a cutover meeting with CenturyLink and the CUSTOMER and the telephone service providers. The purpose of this meeting is to discuss the progress of activities and the cutover readiness.

PSAP training is provided in accordance with the detailed training rollout plans. The system will then undergo a system acceptance test and quality walkthrough. Once complete, and in agreement with the CUSTOMER, a live-traffic cutover will then commence. Once live traffic has moved to the system, the maintenance period begins.

Solution Maintenance

The Solution Maintenance phase begins once live traffic is transferred onto any part of the system. During this phase, CenturyLink and West provide ongoing tiered support services to monitor service level performance, manage help desk requests, escalate support procedures, and support the CUSTOMER to reach the highest level of operational excellence. The solution support team is in place to receive, analyze, and rectify problems and information requests.

3.2 West Project Support

West designates a project manager to act as West's project lead and the primary interface with the CenturyLink project lead and the CUSTOMER's appointed contact for project collaboration. Project collaboration includes:

- Coordination of project kickoff meeting with CUSTOMER
- Coordination with CUSTOMER for implementation planning and design and requirements definition
- Identification and communication of key milestone dates and events for the implementation timeline
- Program tracking of the master project plan and task management of the project implementation
- Coordinate and manage all necessary CenturyLink and West resources to complete the Service deployment activities
- Work with CenturyLink and the CUSTOMER PSAP to develop a detailed project plan that includes milestones for each project phase

Note: This plan is refined over the course of the project as mutually agreed by both parties.

- Appoint a CenturyLink Program Manager

Note: Following the deployment phase completion, the CenturyLink Program Manager will serve as CUSTOMER's primary point of contact for issues resolution, escalations, enhancement requests, and planning.

- Provide CUSTOMER with an emergency support 24x7x365 contact number, a routine support contact list, and an escalation contact list.

Note: It is the responsibility of each party to update and publish these lists on a regular basis.

3.3 CenturyLink Project Support

CenturyLink designates a 9-1-1 operations contact to act as CenturyLink's project lead for the duration of the project. The CenturyLink's project lead works with the West project lead to:

- Assist with the coordination of the project kickoff meeting with West and CenturyLink technical resources;
 - Coordinate CenturyLink's technical resources for implementation planning and design and requirements definition;

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- Reporting and verify problems related to the project;
- Facilitate ongoing communications with West; and
- Assign appropriate CUSTOMER Personnel and experienced call takers at each PSAP who understand the overall impact of the transition of the 9-1-1 systems and can assist in the overall impact planning for transition activities such as testing and migration.

Note: This activity may include West and CenturyLink’s appropriate technical and operational groups to assure a solid understanding of the network architecture, data exchange procedures, PSAP needs, standard operational procedures, and services as designed for the CUSTOMER.

3.4 TSP Communications and Trunk Migration Plan

West works with CenturyLink to develop a joint communication to each PSAP, government organization, and appropriate TSPs outlining the scope of Service to be implemented, a high-level implementation schedule, and key contact information for each entity. West distributes the communication on behalf of CenturyLink.

West takes responsibility for:

- Facilitating the establishment of TSP communication guidelines with CenturyLink and the CUSTOMER;
- Adhering to these guidelines for the project implementation and Service duration;
- Working with the CenturyLink and the CUSTOMER to determine and agree on the strategy for all TSP trunk migrations;
- Establishing expectations with each TSP;
- Managing communication to the TSP for items related to Service on behalf of the CenturyLink; and
- Escalating to CenturyLink, as appropriate, regarding TSP initiatives; requesting CenturyLink intervention when necessary.

4. A9-1-1 ROUTING – SERVICE DESCRIPTION

The system supporting the Service is comprised of redundant, regionally diverse facilities that process an inbound emergency call, determine the correct PSAP according to the ESN and pre-configured routing rules, and send the call to the appropriate Hosted CPE of CUSTOMER’s PSAP.

4.1 A9-1-1 Routing - Call Flow

- 1) Normal Call Flow will be followed where a TSP has 9-1-1 trunks terminated at an A9-1-1 Routing POIs.
- 2) 9-1-1 call is made; call sent to TSP switch
- 3) TSP switch sends call to West Regional Gateway via West POI
- 4) West Regional Gateway sends call to Service, which determines call routing instructions
- 5) Service routes call to appropriate Hosted PSAP CPE
- 6) PSAP CPE delivers call to PSAP workstation

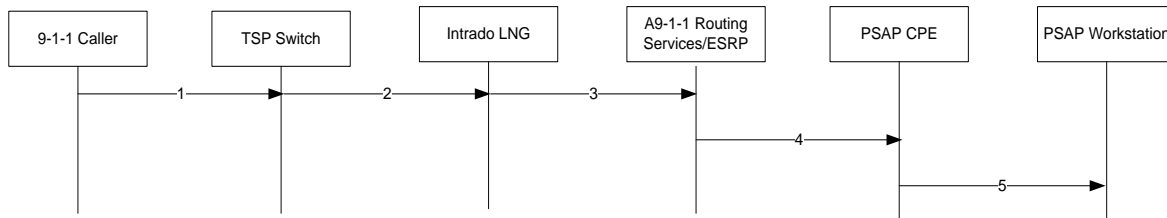


Figure 1: High Level Call Flow

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4.2 A9-1-1 Routing Rules

The Service will process all inbound emergency calls based on the configured routing rules for the PSAP. The A9-1-1 Routing rules allow:

- Management of wireline, wireless, VoIP, and Telematics call types
- Identification of each end office, TSP or MSC trunk for either selective routing or trunk-only routing, based on:
 - Selective Routing: Calling party ANI, ANI match to an ESN and an Electronic Switching System Identification (“ESSID”), or PANI used to look up ANI for WRLS and VoIP calls; and
 - Trunk Only Routing: Incoming End Office trunk is assigned an ESN/ESSID which relates to a specific ingress trunk group.

West will coordinate the data provisioning with each TSP and confirm information to support the signal provisioning for trunks incoming from the End Office or MSC to West, including the following data:

- Incoming signal type
- Call type
- Implied numbering plan administration (“NPA”), if applicable
- PANI administration, if applicable

4.3 TSP Trunk Migration

West works with the ILEC to place the PSAP in-service via the ILEC’s legacy selective router and ILEC End Offices wholly contained within the PSAP’s boundaries for all traffic and in parallel works with each TSP to plan for and execute the migration of its 9-1-1 call traffic to the Service. Once the PSAP has been placed in-service on A9-1-1 Routing via aggregated traffic from the ILEC, each TSP will be requested to establish connectivity from each TSP end office (“EO”) and MSCs serving CUSTOMER’s PSAPs to at least two A9-1-1 Routing POIs. Each TSP will be responsible for the cost of ordering and maintaining required circuits to connect to the POIs such that each EO has routes to at least two POIs for diversity and redundancy. Single POI connectivity from any EO is not warranted under this contract.

Each TSP may connect to West’s A9-1-1 Routing system using any of the following interfaces:

9-1-1 Call Signaling Type	Call From TSP
VoIP 9-1-1	X
SIP (NNI Specification)	X
PRI/NI-2 (wireline, NCAS)	X
Analog CAMA I+7 (I always = 0)	X
DS1 CAMA I+7 (I always = 0)	X
DS1 CAMA 7 (No I digit)	X
SS7 Wireline/NCAS (10 digits)	X

Note: An interim configuration may be required to allow TSP trunk migrations to be performed on a trunk-by-trunk basis to the A9-1-1 Routing system.

If a TSP requires an interface not included in the table above, West will use commercially reasonable efforts to include these additional interfaces.

CenturyLink and West are not responsible for any TSP charges including ILEC for 9-1-1 trunks from TSP End Offices to the A9-1-1 Routing system.

CenturyLink flat rate service fees provide for the delivery of Services for all TSP subscribers within CUSTOMER’s jurisdiction, regardless of increase or decrease in subscriber count during the Term. In the month that CUSTOMER migrates to Managed Services, CenturyLink will invoice for Managed Services and CenturyLink legacy 911 bundled tariff

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services will no longer be invoiced to CUSTOMER. CUSTOMER will continue to be responsible for any existing TSP charges related to TSP presenting the 9-1-1 call (voice and ANI) data to the A9-1-1 Routing network. CUSTOMER will also continue to be responsible for any existing charges from other 9-1-1 service providers related to 9-1-1 call transfer to PSAPs on foreign SRs, or any other services outside the scope of this Service Guide. If CUSTOMER is currently obligated to pay for TSP TN data (SOI files) and/or End Office trunks, this agreement does not eliminate that obligation.

4.4 Voice and Data Transfer and Bridge Capabilities

The Service supports the following flexible transfer and bridge capabilities:

- Selective Transfer/Bridge: The ability for the call taker to transfer an incoming 9-1-1 call to another agency by pressing a button labeled with the type of agency; e.g., "Fire," on the PSAP call-handling equipment.
- Fixed Transfer/Bridge: 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.
- Manual Transfer/Bridge: The ability for the call taker to complete a manual transfer.

Interconnection with the legacy 9-1-1 service provider's SRs and ALI systems will require the cooperation of such service provider. The Service assumed that all transfers will continue to be completed to agencies as currently, conducted via PSTN without ANI or ALI. If the legacy 9-1-1 service provider does not support the inter-ALI connectivity, an alternate method of call transfer processing will be required. The alternative to inter-ALI connectivity is for both West and the legacy service provider to provision TN data into their respective ALI systems. This method is also known as 'dual loading'. In using this method, the call transfer is performed (including ANI) via the interconnection between the legacy service provider and West Selective Routing solutions. ALI is provided by the 9-1-1 Service Provider for the receiving PSAP.

4.5 Implementing Configurable PSAP Attributes

West will provision the PSAP configurable attributes as requested by CUSTOMER. The CUSTOMER identifies which personnel at each of CUSTOMER's PSAPs are authorized to request PSAP configurable attribute changes.

West will configure a minimum of the following PSAP configurable attributes for each of CUSTOMER's PSAPs.

- Route Lists/Routing Rules:
 - Primary and alternate routes
 - Selective transfer star code destinations (i.e. *11 thru*19) for first responders, Police, Fire, and EMS
 - Fixed bridge lists (i.e. *20 thru *49) such as poison control or neighboring PSAPs
 - PSAP abandonment routing rules

PSAP preferred routing instructions apply to the following:

- PSAP Abandonment Routing: Specific routing instructions to be applied if the PSAP must evacuate the facility.
- PSAP Alternate Routing: Specific routing instructions to be applied as alternate location for routing if all lines to the primary PSAP are busy, or the primary PSAP is closed for a period of time. Multiple, prioritized alternate route destinations are supported.
- PSAP Default Routing: Specific default routing instructions to be applied for each incoming trunk group. 9-1-1 calls are routed to the default PSAP if an ANI failure occurs, unintelligible digits received from end office, or other rare causes.
- PSAP Destinations and Route Lists: PSAP is able to specify a unique route list for each routing rule. These route lists allow for designation of a primary target for call routing and includes numerous prioritized alternate destinations such as:
 - PSAP served by A9-1-1 Routing
 - PSAP served by a non-West selective routing service
 - PSTN number
 - Busy
 - Treatment message

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- Tone
- PSAP Trunk Group Management: Each incoming trunk group is individually designated to carry a particular call type and/or combination of call types (wireless, wireline, VoIP, Telematics).

Note: All PSAP data is gathered during the Definition Phase of the project.

4.6 Modifying Configurable PSAP Attributes

Following production turn-up of the Service, West will complete PSAP configurable attribute changes within five Business Days of receipt of a written request (including email) from CUSTOMER or authorized CUSTOMER PSAP personnel.

All requests must be submitted to the West Project Manager for review and implementation or, following Production Turn-up, to the West Program Manager. The five Business Day timeline may be exceeded if the West Project/Program Manager determines that further discussion is needed with PSAP before implementing the changes, for example where the change is technically inadvisable or unfeasible.

For PSAP abandonment, CUSTOMER may contact the CenturyLink Network Reliability Operation Center (NROC) to engage the configured PSAP Abandonment Rules. The CenturyLink NROC will engage the PSAP Abandonment Rules within 15 minutes of receiving a PSAP abandonment request.

4.7 A9-1-1 PSAP Management Portal

The A9-1-1 PSAP Management Portal (“PMP”) is a web-based tool that will provide CUSTOMER and CUSTOMER’s PSAP administrators view only access to A9-1-1 Routing configurations and call activity. The PMP allows authorized users to view A9-1-1 Routing configurations for each PSAP, including call transfers, routing, and other configurations. In addition, the user may research Call Detail Records for call activity based on a specific date range. Each PSAP is accessed via a unique logon.

Currently, the PMP is accessed through West via West’s Universal Portal (“IUP”).

PMP can provide the following information:

- Primary Route—ESNs that route to your PSAP as Primary;
- Alternate Route—ESNs where CUSTOMER’s PSAP serves as the alternate for another PSAP;
- Default Routs—End Offices that use CUSTOMER’s PSAP as the default route for calls. Includes ESN, TSP, CLLI, and ESCO; and
- Abandoned Routs—abandonment Route where CUSTOMER’s PSAP serves as the abandonment route for another PSAP.

4.8 Split Rate Center Scenarios

Wireline end offices where CUSTOMER PSAPs receive West’s Service and some end users are served by another entity’s 9-1-1 routing service are considered to be “split end offices” or “split wire centers”). The following considerations must be finalized prior to implementation of Service.

- TSP or ILEC may be requested to “sort” the 9-1-1 call traffic at the split wire center (end office) within a rate center, and directly route all 9-1-1 traffic that is destined for the CUSTOMER from the split wire center to the West A9-1-1 Routing network where the TSP or ILEC have the predominate number of subscribers in the rate center for selective routing

Note: Such capability is possible where TSPs or ILEC integrate the MSAG into the front-end service provisioning process and set appropriate attributes on each line at the end office to effectuate routing over the proper trunk group to the proper 9-1-1 routing service.

- Where West has the predominate number of subscribers in a given rate center, West may act as the aggregator of the traffic and deliver the traffic back to the ILEC.
- West will work cooperatively with the TSP and the LEC to establish call routing and call handoff arrangements.
- West will work with TSPs and LECs to resolve wire center overlap issues.

Note: West’s A9-1-1 Routing implementation depends on TSP and LEC cooperation to resolve

5. REPORTING TOOLS

West will provide a web-based tool, Clear View, for metrics reporting.

5.1 Clear View Reporting Tool

West will provide CUSTOMER with up to three Clear View Reporting tool user accounts per CUSTOMER PSAP for access to Service metrics. Clear View provides a number of breakout reports which can be queried based on a daily, weekly, or monthly basis. CUSTOMER may determine the distribution of these user accounts between CUSTOMER's administrative staff and CUSTOMER's PSAPs.

West will assign each Clear View reporting tool user a unique user ID, password, and a Secure ID token ("User Account"). User Accounts may not be shared. West will work with CUSTOMER to determine and configure the appropriate data access profile for each user account. User accounts, which may include a physical security device (e.g. West-issued token or card) to support two-factor authentication, may not be shared. Additional User Accounts or replacement of a misplaced security device are subject to additional Security Device fees.

West currently posts data updates to daily data sets by 9:00AM Mountain Time ("MT"), and updates to monthly data sets by the sixth business day of each month immediately following the reporting month. CUSTOMER will be able to access one year of metrics data through the Clear View Reporting tool. CUSTOMER metrics report requests older than one year are out of scope and subject to change order.

West will provide support services for the Clear View reporting tool during West Normal Business Hours, defined as Monday through Friday 8:00 AM to 5:00 PM Mountain Time, excluding West holidays.

5.2 Reports

The following are reports for the Service provided with the Clear View tool. Additionally, for any specific call, call detail is available through the West A9-1-1 PMP.

- Clear View call processing and call status reports include:
 - Event Count Reports per Hour– provides metrics for total calls in which CUSTOMER's PSAP participated by hour for a day, week or month
 - Event Count Report by Trunk Group – provides metrics for total calls in which CUSTOMER's PSAP participated and provides metrics for calls attempted, calls transferred out, calls transferred in
 - Event Count by Routing Reason and Destination – Indicates counts where CUSTOMER's PSAP participated as the Primary versus Alternate, whether the call was answered or busy, for Default versus Selective routed, and for call where the destination was "Not Available" (includes abandoned, rejected, transferred and handed-off calls). Provides metrics for total calls, initial calls, calls transferred out, and calls transferred in for each category.
 - Event Count by Type – Indicates counts by call type (wireless, wireline, VoIP) where CUSTOMER's PSAP is primary, and provides metrics for total calls, initial calls, calls transferred out, and calls transferred in.
 - Event Count by Incoming Trunk – Indicates the number of calls sent to CUSTOMER's PSAP by each trunk, and provides metrics for total calls, initial calls, calls transferred out, and calls transferred in for each category.
 - Bridge Call Summary – provides metrics for calls bridged in or out by bridge type (fixed, selective, manual). Call detail is available for each bridged call.
 - Routing Database Processing – provides a breakout of initial calls where CUSTOMER's PSAP was Primary by selectively routed versus default routed with a No Record Found ("NRF") breakout
 - Event Setup Time – provides statistics on the time to route and deliver calls where your PSAP is Primary, including the minimum, maximum, median and average times.

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1.1. Service Summary

West’s Location Data Management Service (the “Service”), provided by CenturyLink, provides hosted location and CUSTOMER information database systems and services, including Master Street Guide (MSAG) validation, service order input (“SOI”) processing and validation, and metrics reporting. This Service Guide provides CUSTOMER with the following information:

- Responsibility Matrix
- Project implementation tasks to move to the Service
- Detail on the Service, including a services description and response times
- Operational coordination between CenturyLink, West, and CUSTOMER

1.2. Responsibility Matrix

The following matrix outlines the typical responsibilities of each party for the Service. Where all parties have been listed, the party with primary responsibility is listed first. Additional detail on the responsibilities of each party is included in the Sections below. Failure of a party to satisfactorily complete a required task could materially impair West’s ability to provide the Service.

Task	Responsibility
Project Implementation	
Project Management	West/CenturyLink
Telecommunications Service Provider (TSP) Coordination	West/CenturyLink
Develop West methods and procedures <ul style="list-style-type: none"> • West’s operations • West’s interface with TSPs, county/municipal coordinators, and each CUSTOMER PSAP 	West
Process Documentation	West/CenturyLink
Location Data Management Service system architecture	West
PSAP facilities	CenturyLink & CUSTOMER
Wire Center Overlap Resolution Data Integrity	West/TSP
MSAG Extracts	CenturyLink & CUSTOMER
TN Record Extracts	West/TSPs
MSAG Analysis	West
TN Record Analysis	West
MSAG Data – Issue Resolution	West/CUSTOMER
TN Record Data – Issue Resolution	West/CUSTOMER/TSP
Selective Router Database (“SRDB”) Updates	West
Non-West PSAP Equipment <ul style="list-style-type: none"> • This may be legacy equipment or new equipment purchased under another CUSTOMER agreement. • Non-West PSAP Equipment includes the Computer Aided Dispatch (CAD) system and the radio system if applicable 	CUSTOMER
End to End Testing	West/CenturyLink
Final Data Load – MSAG, TN Record	West/TSP/CenturyLink
Training on Location Data Management Systems and Service (PSAPs, TSPs, Third Party Providers)	West/CenturyLink

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Task	Responsibility
Develop plan and execute Migration Testing	West/CenturyLink
Production Turn-up	West/CenturyLink
Ongoing Responsibilities	
TSP Coordination	West
TSP Escalation Point	CenturyLink
Maintain West methods and procedures <ul style="list-style-type: none"> • West operations • West interface with TSPs, county/municipal coordinators and each CUSTOMER PSAP 	West
Data Integrity	
MSAG Build/Maintenance	West/CenturyLink
Service Order Processing	West
Error Correction and Referral	West/CenturyLink/TSP
TN Data Extracts and Distribution	West
MSAG Data Extracts and Distribution	West
Basic LNP Processing	West
Database Reconciliations	West
SRDB Updates	West
ESN/ELT Build/Maintenance	West/CenturyLink
ALI Discrepancy Reporting/Resolution	West/CUSTOMER/TSP
Metrics Reporting	West
Trend Analysis/Data Investigation	West/CenturyLink
System Monitoring	West
System Maintenance	West
System Upgrades	West
Log storage and backups	West
Problem Reporting	West/CenturyLink
Problem Triage and Resolution	West/CenturyLink
Single Point of Contact for CenturyLink & TSP Data Issues	West

Table 1: Responsibility Matrix

2. PROJECT IMPLEMENTATION

2.1. Overview

The Service implementation begins with a planning phase, where communications with the LEC and other TSPs are initiated, connectivity between the CUSTOMER’s PSAP(s) and data collection and analysis begins.

Following the initial planning phase is data collection and simulations. West will work with each CUSTOMER PSAP to migrate location data management from the legacy ALI provider to the Location Data Management Service system. West will also work with each TSP and CUSTOMER PSAP to conduct data processing simulations.

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West will work with CenturyLink to schedule migration of each PSAP to the Service as data collection for each PSAP and TSP simulations are completed. The Service may be deployed in phases to allow for establishing the necessary agreements with the LEC and other TSPs.

The Service may be deployed in phases to allow for establishing the necessary agreements with the LEC and other TSPs.

2.2. Implementation Project Support

West designates a project manager to act as West's project lead and the primary interface with both CenturyLink and the CUSTOMER's appointed contact for implementation project collaboration, including identification and communication of key milestone dates and events for the implementation timeline. The West project lead manages overall program tracking of the master project plan and task management of the project implementation. Similarly, CenturyLink designates a 9-1-1 operations contact to act as the CenturyLink's project lead. The CenturyLink's project lead works with the West project lead in reporting and verifying problems, and facilitates ongoing communications with West.

The West and CenturyLink project leads will manage a kickoff meeting to establish communication strategies and contacts between the Parties, review the scope of the Service, and review the requirements and timelines. The project leads will facilitate additional meetings as necessary for implementation planning, design, and requirements definition. The meetings include both West and the CenturyLink's appropriate technical and operational groups to assure a solid understanding of the network architecture, data exchange procedures, PSAP needs, standard operational procedures, and Service as designed for the CUSTOMER.

For efficient project implementation, CenturyLink will assign appropriate personnel at each PSAP who understand the overall impact of the transition of the 9-1-1 services and can assist in the overall planning for transition activities such as testing and migration. The West project manager coordinates and manages the necessary West resources to complete the Location Data Management Service deployment activities. The West project manager works with each CUSTOMER PSAP to develop a detailed project plan that includes milestones for each project phase. This plan is refined over the course of the project as mutually agreed by both parties. The West and CenturyLink Project Managers will be available for regular status meetings and as necessary to ensure the project moves forward appropriately.

2.3. Contact Lists

West, CenturyLink, and CUSTOMER will exchange key contacts for technical, operational, and managerial personnel assigned to the Service deployment. In addition, West will provide CenturyLink with an emergency support 24x7x365 contact number, a routine support contact list, and an escalation contact list. It is the responsibility of each Party to update and publish these lists on a regular basis.

2.4. TSP Coordination

West works with CenturyLink to develop a joint communication to each PSAP, government organization, and appropriate TSPs outlining the scope of Service to be implemented, a high-level implementation schedule, and key contact information for each entity. West distributes the communication on behalf of CenturyLink.

West establishes expectations with each TSP and manages communication to the TSP for items related to Location Data Management Service on behalf of CenturyLink. West will escalate to CenturyLink as appropriate regarding TSP initiatives and will request CenturyLink intervention when necessary.

2.5. TN and MSAG Data Migration

West works with CenturyLink and each TSP to transition E9-1-1 data for each of CUSTOMER's PSAPs, including Telephone Number ("TN") records and tabular MSAG records to West's Location Data Management systems.

For the initial migration, CenturyLink is responsible for providing the following in accordance with the detailed project plan timeline:

- A full MSAG extract for the E9-1-1 service area of each CUSTOMER PSAP
- A complete list of all ESNs and ELTs in an electronic form for the E9-1-1 service area of each CUSTOMER PSAP

West works with each TSP to obtain a copy of TN records. On receipt of both the TN record extracts and the CUSTOMER's MSAG, West performs a data analysis. The data analysis consists of a TN simulation process to determine the percentage of TN records that will initially pass MSAG and data field validations prior to the load into the West location data management system. West will compare the CUSTOMER MSAG against each TSP's TN records and return all

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discrepancies to the TSP, to CenturyLink, or to the county/municipal coordinator, as appropriate for investigation and resolution.

Unless agreed otherwise, West requires the percentage of TNs that successfully pass MSAG validation (“Match Rate”) in the TN simulation to be 98% or greater for all TSP TN records prior to data being loaded into West’s production database management for data validation. If the Match Rate is less than 98% or the agreed upon rate, West will work jointly with the CUSTOMER and each TSP to increase the quality of the MSAG and TSP data to further increase the Match Rate, provided, however, that it is ultimately CUSTOMER’s and each TSP’s responsibility to reach the Match Rate.

CenturyLink and West will perform up to three TN simulations at no cost to CUSTOMER.

Once the Match Rate has been achieved, the TSP TN data is deemed acceptable to load into the West data management system.

The following services are out of scope and may be addressed through a change order:

- Data Transition services including MSAG builds and TN record loads for any municipality located outside CUSTOMER’s E9-1-1 Service Area
- Conversion of MSAG data that is not in electronic form, creation of a new MSAG database, or repair to an MSAG that lacks defined emergency service zones (if needed) and/or ESNs
- GIS related services

2.6. Wire Center Overlap Resolution

West’s Location Data Management implementation depends on TSP and LEC cooperation to resolve wire center overlap issues.

Wireline end offices for which 9-1-1 calls for some TNs need to route to a PSAP utilizing one location data management (ALI) service and 9-1-1 calls from other TNs need to route to a PSAP using a different location data management (ALI) service are considered to be “split end offices” or “split wire centers”.

For these split end offices, the TSP will be requested to “sort” the TNs within the split wire center, and submit/maintain data for TNs that should route to CUSTOMER PSAPs to the West Location Data Management system.

Where the TSP cannot segregate the TN data at end office level, the TSP and West will work cooperatively with the TSP and the LEC to establish data provisioning and processing arrangements.

3. POST IMPLEMENTATION SERVICES

The Service includes hosted systems and data management services to deliver E9-1-1 location information to CUSTOMER’s PSAPs.

Location Data Management Service include receiving and processing periodic tabular MSAG updates from CUSTOMER, receiving SOI records from TSPs, systematically validating such records against the tabular MSAG, correcting TN records that are not MSAG valid, and posting validated TN record updates to the ALI system and SRDB. TN error records are created for TN updates submitted that fail validations.

West’s redundant ALI systems deliver E9-1-1 location information data in a conventional ALI format to the CUSTOMER’s call handling system, for subsequent display on each PSAP CPE workstation.

West appoints an E9-1-1 data integrity manager to work with CUSTOMER and TSPs in reporting/verifying problems, reviewing/rectifying error reports, and managing system administration duties.

3.1. Service Order Exchange

West works with each TSP in CUSTOMER’s E9-1-1 Service Area to determine the most appropriate connectivity for electronic service order data exchange. Depending on the TN Record volume, a dedicated circuit or secure Internet connectivity may be selected for data exchange.

West will provide the CUSTOMER and each TSP with data exchange guidelines (detailing input and output files with required data elements and error codes). West may periodically update the data exchange guidelines, as appropriate.

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3.2. West Portal

West will provide and maintain a hosted web-based interface to West's suite of web-based tools and applications, otherwise known as the West Portal ("IUP"). IUP will provide the CUSTOMER, its PSAPs, and TSPs secure access to applicable West support tools and documentation. The following web-based applications and information are available through IUP following user authentication through the West identity management system:

- 9-1-1 NET® – web-based data management interface
- ClearView Metrics – for access to metrics reports
- Document Library – for downloading training materials, user's guides, and other documentation
- File Transfer Tool – for upload/download of files such as extracts or SOI and errors/statistics files

3.3. 9-1-1 NET

West's web-based data management system, 9-1-1 NET, allows each CUSTOMER PSAP, TSPs, and West data analyst to perform a number of functions.

The 9-1-1 NET system provides PSAPs with online access to production 9-1-1 data, change requests/discrepancy reports, historic tracking and reporting capabilities. The system automatically returns a transaction number verifying the acceptance of the change request, which can be used later to search for the record.

With 9-1-1 NET, CUSTOMER PSAPs can access 9-1-1 data records in their E9-1-1 Service area, including MSAG records, TN and TN error records, past ALI responses, and ESN/ELT records, and request and track corrections to these records through change requests ("CRs") and discrepancy reports ("DRs"). Through 9-1-1 NET, CUSTOMER PSAPs are able to query for and export up to 10,000 records, and they can also obtain status information and metrics data.

With 9-1-1 NET, TSPs can access their TN records, TN error records, and TN change requests; process change requests (CRs/DRs) referred to them and view MSAG records.

3.4. User Account Configurations

West will work with CUSTOMER to configure user access to appropriate applications for each user or user type. Additionally, West will ensure each user account is configured with the appropriate data access profile.

West will provide CUSTOMER with up to three unique user accounts per CUSTOMER PSAP for access to West web applications through the IUP. West will assign each IUP user a unique user ID, password, and a secure ID token. User accounts may not be shared by multiple people. West will work with CUSTOMER to determine and configure the appropriate data access profile for each user account. Additional user accounts or replacement of a misplaced secure ID tokens are subject to additional fees.

West will separately provide and configure IUP user accounts for each TSP.

West will provide CUSTOMER user documentation including a user's guide for each West web application through the IUP.

3.5. Data Management Services

West has primary responsibility for data management tasks listed in Table 1. Tasks for which CenturyLink, CUSTOMER's PSAPs, the county/municipal coordinators in CUSTOMER's E9-1-1 Service Area, or the TSP have partial responsibility for are also identified. West will work with CUSTOMER to mutually agree on process flows for data management services between West, CUSTOMER's PSAPs, and the county/municipal coordinators. Any changes to the designated responsible Party will be mutually agreed on.

West will create and maintain process documentation for all data management services.

3.5.1. Address Corrections

CUSTOMER may submit TN record address corrections to West. West will work with the identified TSP for correction/resolution of the subscriber's address.

3.5.2. MSAG Maintenance

Each CUSTOMER PSAP and municipal/county coordinator in each CUSTOMER PSAP's E9-1-1 Service Area will submit all MSAG change requests and updates through 9-1-1 NET. CUSTOMER may also submit TN change requests through 9-1-1 NET. Each CUSTOMER PSAP will provide West with all additions and changes to ESNs and ELTs.

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On receipt of CUSTOMER's MSAG Change Requests through 9-1-1 NET, West will provide daily MSAG maintenance support, inclusive of inserts, changes, and deletes on current MSAGs and ESN/ELTs.

Special Projects such as readdressing, annexations, MSAG scrubs, and county-wide MSAG changes are considered 'MSAG Special Projects' and may require more than one business day. MSAG Special Projects that require more than 1,000 MSAG record changes are out of scope and may incur additional fees.

3.5.3. Error Correction Maintenance

West will return all MSAG-related TN errors directly to the appropriate TSP for correction. Each TSP will be responsible for resubmitting an electronic SOI record to West for final error correction when the record content must be changed to correct the error.

3.5.4. ESN/ELT Table Maintenance

West will manage ESNs in the West Data Management and ALI systems and the associated ELTs as provided by each CUSTOMER PSAP. This task consists of maintaining assigned ESNs and ELTs in system tables. West will provide CUSTOMER with ESN/ELT information on request.

3.5.5. Wire Center Boundary Conflicts

West will research wire center boundary conflicts that affect 9-1-1 call delivery. West will work with the LEC in resolving these conflicts. Geographic porting (porting outside of current rate center) is not included in wire center overlay issues.

3.5.6. Database Maintenance/Activities

West will correct or refer all errors, MSAG updates, and ALI discrepancies within one Business Day of receipt.

3.5.7. MSAG Distribution

West and CUSTOMER will mutually agree upon an MSAG distribution schedule not to occur more frequently than monthly. In accordance with the agreed schedule, West will distribute an electronic copy of CUSTOMER E9-1-1 Service Area MSAG to agencies and personnel authorized by CUSTOMER. With CUSTOMER approval, West will distribute electronic daily MSAG updates (deltas) to the TSPs.

3.5.8. No Record Found/Misroute Investigation/Discrepant Address

West will research and work with each TSP to resolve all NRF and ALI discrepancy reports once they have been submitted through 9-1-1 NET. West will investigate misroutes and refer the misroute to the applicable TSP if appropriate.

3.5.9. Database Reconciliation

For each TSP serving CUSTOMER's PSAPs, West will offer one database extract to each TSP on an annual basis for the TSP to perform its own database reconciliation. West does offer database reconciliation services to its CUSTOMERS for an additional fee.

3.5.10. NPA Splits/Overlays

NPA splits or overlays are the responsibility of the TSP. West will update databases and tables with revised NPA information provided by TSP. The TSP should provide at least three months advance written notice to West to coordinate the necessary changes. Requests of less than three months are out of scope and will require a change order.

3.5.11. Local Number Portability ("LNP") Services

West will provide LNP services in CUSTOMER's E9-1-1 Service Area in alignment with the NENA recommendations for LNP. It is each TSP's responsibility to fix its LNP errors. West provides LNP reports daily to the TSPs.

3.5.11.1. Company ID

West will validate service order activity for proper Company ID. West will provide the Company ID in the ALI data stream.

3.5.11.2. Function Codes

West will accept M ("Migrate") and U ("Unlock") function codes on service order activity.

3.5.11.3. Database Fields

West will provide fields in the TN database records to indicate whether the record is in a Locked or Unlocked status. LNP-related errors are also assigned error codes.

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3.5.11.4. LNP Reports

West will provide each TSP with the following LNP reports on a daily basis:

- Unlock exception report (“Stranded Unlocks”)
- Migrate expired report
- Migrate received not unlocked report
- Migrate pending report
- Successfully migrated report

3.5.12. SRDB Updates

West will provide an SRDB update for all records that have successfully passed data validation by West’s data management system. SRDB updates will be posted to the 9-1-1 Routing system within one business day following successful data validation.

3.5.13. Wireless, VoIP, and Telematics Support

West’s database management systems support both VoIP and Wireless Phase I and Phase II E9-1-1 call processing. West validates pANI shell records submitted by TSPs or their third party providers against the West-maintained MSAG records, and uploads the pANI shell records into the ALI database systems. NENA Company ID is required on all pANI shell records.

West will build and maintain the ALI Steering Table on the ALI systems. The ALI Steering Table is used by the ALI system to determine which MPC/GMLC/VPC to query for E9-1-1 location information. All wireless, VoIP, and Telematics E9-1-1 location updates to the ALI system are via the E2 Interface (ANSI/J-STD-036-C-1).

West will establish agreements with each Wireless, VoIP, and Telematics TSP (or their third party database providers) for access to West’s relevant systems. Wireless, VoIP and Telematics TSPs (or their third party database providers) are responsible for establishing and maintaining connectivity to these systems and bear all connectivity and support costs.

West will help support E9-1-1 troubleshooting in production as well as pre-production live ALI testing from the host ALI perspective. The support West provides includes (i) pulling log files, (ii) monitoring ALI bids from the PSAP, (iii) monitoring data traffic between ALI and a wireless or VoIP provider’s MPC/GMLC/VPC, and (iv) verifying that the ALI Steering Tables are configured correctly.

3.6. Wireline ALI Steering

On execution of the necessary agreement, West will establish communications for ALI to ALI steering with neighboring ALI Systems. ALI to ALI steering will be performed for wireline 9-1-1 calls only.

At CUSTOMER’s direction, West can support any of the following types of wireline ALI steering:

- Trunk steering, where the bid to an ALI system contains a unique trunk number to identify when a query should be steered to another ALI system.
- No Record Found (“NRF”) steering, where an ALI steering query is sent to another specified ALI system when there is an NRF in the ALI database.

CUSTOMER acknowledges that coordination will be required between CUSTOMER and each TSP in the assignment and on-going management of English Language Translations (“ELTs”) by ESN/ESSIDs. Without this coordination, the ELTs returned in the ALI response may not be correct.

West will perform initial system configuration on each West ALI system to set-up steering for Wireline TNs to/from each foreign ALI system. West will perform an initial ALI steering table set-up and load, and be responsible for its ongoing maintenance.

West will provide connectivity between each foreign ALI system and each West ALI serving CUSTOMER, where possible. Existing connectivity from foreign ALI to the West ALI serving CUSTOMER will be utilized, where possible. West will work with CUSTOMER to complete pre-production testing of ALI steering with each foreign 9-1-1 Service Provider.

West will provide production technical support and troubleshooting to CUSTOMER’s PSAPs and to CUSTOMER for ALI steering related issues.

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4. METRICS REPORT TOOL

West will provide a web-based tool, ClearView, for metrics reporting.

4.1. ClearView Reporting Tool

ClearView provides a number of breakout reports which can be queried based on a daily, weekly, or monthly basis following login and authentication through the IUP. CUSTOMER may determine the distribution of these user accounts between CUSTOMER's administrative staff and CUSTOMER's PSAPs. West currently posts data updates to daily data sets by 9:00 AM Mountain Time (MT), and updates to monthly data sets by the sixth business day of each month immediately following the reporting month. CUSTOMER will be able to access one year of metrics data through the ClearView Reporting tool. CUSTOMER metrics report requests older than one year are out of scope and subject to change order.

West will provide support services for the ClearView Reporting Tool during West Normal Business Hours, defined as Monday through Friday 8:00 AM to 5:00 PM Mountain Time, excluding West holidays.

4.1.1. ClearView Reports for Location Data Management

West will provide CUSTOMER with the following ALI Management metrics reports through the ClearView reporting tool.

- Primary Metrics Summary Reports
 - Service Order Processing
 - Daily Error By Number of Records Processed
 - Unresolved Errors at End of Month
 - ALI System Availability
 - ALI Records Found
- Monthly TN Census Report
- Monthly ALI Retrieval Report
- Monthly ANI Failure Report
- System Performance Reports
- NRF Reports
- SOI Reports
- TSS Error Reports

5. MAPSAG®

MAPSAG IS A GIS DATA MANAGEMENT APPLICATION USED BY CITY OR COUNTY GIS PROFESSIONALS, OUTSIDE OF THE CALL TAKING ENVIRONMENT, ALLOWING THE END-USER TO CREATE AND MAINTAIN ACCURATE 9-1-1 GIS DATA AND TO SYNCHRONIZE THE GIS DATABASE AND THE 9-1-1 DATABASE. THE RESULT IS A "CHECKS AND BALANCES" APPROACH OF CONSISTENCY AND ACCURACY ACROSS DATABASES USED FOR ADDRESSING AND 9-1-1. MAPSAG IS INSTALLED LOCALLY, AT THE END-USER LOCATION, AND OPERATES THROUGH A SIMPLE INTERFACE WITHIN ESRI'S ARCGIS DESKTOP PRODUCT. VARIOUS TOOLBARS ARE AVAILABLE FOR ACCESSING THE AVAILABLE TOOLS AND FEATURES. THE FUNCTIONALITY THAT RESIDES IN THE ARCGIS DESKTOP FRAMEWORK REMAINS AVAILABLE WHILE USING MAPSAG, INCLUDING EDITING, DRAWING, LAYOUTS AND/OR SPATIAL QUERIES. AN EXAMPLE OF THE INTEGRATION OF MAPSAG AND ARCGIS DESKTOP IS THAT USERS CAN PERFORM A SPATIAL OR ATTRIBUTE QUERY AND USE THE RESULTING RECORDS FOR ANALYSIS BY THE MAPSAG TOOLS.

USING MAPSAG, ARCGIS DESKTOP AND A COMBINATION OF BOTH, NEW GIS DATA RECORDS (STREETS, STRUCTURES, POLYGONS ETC) CAN BE INPUT INTO THE GIS IN A NUMBER OF WAYS, INCLUDING FIELD GPS, ON-SCREEN DIGITIZING, IMPORT, AND AUTO-GENERATION. THE MAPSAG SOFTWARE CURRENTLY OPERATES IN THE LATEST VERSION OF ARCGIS FOR DESKTOP (CURRENTLY 10.2.X) AND WILL UTILIZE A PERSONAL GEODATABASE, FILE GEODATABASE OR AN ENTERPRISE GEODATABASE THROUGH ARCGIS SERVER ("ARCSDE").

MAPSAG SOFTWARE REQUIRES A LICENSED COPY OF ESRI'S ARCGIS FOR DESKTOP, TO BE PROVIDED BY THE END-USER OR CAN BE PURCHASED FROM WEST. ONE COPY OF MAPSAG WILL BE PROVIDED FOR EACH PSAP LOCATION.

ADDITIONAL OPTIONAL MODULES:

SIMPLECELL® TURNS CELL SECTOR AND CELL TOWER TABULAR DATA FROM WIRELESS CARRIER ROUTING SHEETS INTO VALUABLE GIS DATA THAT CAN BE APPLIED TO A VARIETY OF SITUATIONS.

CENTURYLINK® 9-1-1 AGREEMENT
CENTURYLINK NEXT GENERATION 9-1-1 SERVICE EXHIBIT
CENTURYLINK / WEST SERVICE GUIDE – LOCATION DATA MANAGEMENT

911 MAPBOOK GREATLY REDUCES THE EFFORT OF CREATING MAP BOOKS FROM GIS DATA. THE MAP BOOKS CAN THEN BE DISTRIBUTED IN HARD COPY OR PDF FORMAT TO FIRST RESPONDERS.

6. TRAINING

West will provide training for the Service to CUSTOMER PSAP personnel, county/municipal coordinators in the CUSTOMER E9-1-1 Service area, and each TSP.

The CUSTOMER is responsible for identifying the training attendees from each CUSTOMER PSAP, ensuring they attend the West provided training, and any expenses incurred by CUSTOMER's training attendees.

West will provide training materials and user documentation for all training sessions. CUSTOMER may reproduce and internally distribute copies of West provided training materials as necessary to CUSTOMER and CUSTOMER PSAP personnel only.

CUSTOMER and West will agree on a training schedule. West requires notice of rescheduling at least ten Business Days in advance or an additional fee may apply. West may combine multiple topics and/or target attendees from multiple CUSTOMER groups for maximum efficiency.

Training will be "train-the-trainer" format, which will enable CUSTOMER PSAPs to train new employees. The CUSTOMER is responsible for training additional personnel at CUSTOMER's PSAPs, as necessary, or contracting with West to provide additional training. Additional training is out of scope and will require a change order.

6.1. PSAP Administrators

West will provide one training session for CUSTOMER PSAP administrators. This training is expected to last up to two days and will be conducted as mutually agreed between West and CUSTOMER (e.g. webinar, onsite at central PSAP location, at West facilities). CUSTOMER may determine the number and type of employees attending the West training. This training will focus on:

- Location Data Management flow and processes
- IUP and IUP Tools
- 9-1-1 NET
- ClearView Reporting Tool

6.2. TSP Information Sessions and Training for County/Municipal Coordinators

West provides up to two information sessions of up to four hours for TSPs who serve the CUSTOMER E9-1-1 Service Area via telephone conference call. Topics will include data exchange procedures, data processing procedures, 9-1-1 NET9-1-1 NET, reporting problems to West and escalation procedures, and other mutually agreed upon topics. The information session(s) should be completed prior to the first TSP migration to West Service and must include participation by the designated West and CenturyLink Project Leads.

- West will separately provide training on 9-1-1 NET9-1-1 NET to county/municipal coordinators. Training will be via telephone conference call and will last approximately two hours.

**CENTURYLINK® 9-1-1 AGREEMENT
CENTURYLINK AIRBUS HOSTED VESTA SERVICE EXHIBIT**

1. General. The Airbus DS Communications VESTA® Hosted Emergency Call Handling System (the “Service”) is provided by CenturyLink QCC under the terms of the Agreement, this Service Exhibit, and any signed Order Forms are between CenturyLink QCC and Customer.

2. Service.

2.1 Description. The Service is provided to Customer by CenturyLink, an authorized Airbus DS Communications reseller. The Service only includes the features and functionalities described within this Section 2. The Service provides hosted emergency call handling functionality using a system that includes several Airbus DS Communications applications. These applications include: VESTA 9-1-1 Call Handling solution, VESTA Analytics MIS solution, VESTA Locate mapping solution, map updates via DataSync and the associated hardware, software and peripherals needed to deliver the Service.

The Service will provide the Customer with:

- Secure, geo-diverse, redundant hosted, multi-tenant infrastructure;
- VESTA® 9-1-1 advanced NG9-1-1 call-processing workstations;
- Functionality and performance equal to customer premise-based systems;
- Call Taker and Server Virus Protection and Patch Management, pre-tested and verified;
- Airbus DS Communications Software Support; and
- All HW/SW typically needed. See the list of hardware needed for a typical system below in or more details

The Service includes Airbus DS Communications software, hardware and equipment operating in geo-diverse CenturyLink provided data centers. Service includes Airbus DS Communications software and hardware which is made available to Customer and described in this Service Exhibit. The Service will be operated and maintained by CenturyLink along with Airbus DS Communications software support and managed services, including general software updates made available for the Service by Airbus DS Communications.

2.2 ADVANCED CALL HANDLING SOLUTION. THE ADVANCED CALL HANDLING SOLUTION INCLUDES:

Option	Included?
VESTA 9-1-1	Included (Advanced Call Processing, or ACD) (Activated at Customer Discretion)
VESTA Analytics	Included
Virus Protection	Included
Security Patch Management	Included
Monitoring & Response	Included
VESTA Locate	Included
Agent Training	Included
Admin Training	Included (1) Class Per PSAP
Cutover Coaching	Included (1) Per PSAP
Field Engineering	Included Remote FE
Project Coordination	Included
Software Support	Included

CENTURYLINK® 9-1-1 AGREEMENT
CENTURYLINK AIRBUS HOSTED VESTA SERVICE EXHIBIT

2.3 Feature Overview. The Service uses the configurable VESTA® 9-1-1 platform. A variety of features and configuration options are available depending on the package purchased by Customer. A high level summary of some of the key features of the Service is provided below.

A. Scalable IP-Based Solution. The Service leverages Session Initiation Protocol (SIP) technology and allows a Customer's PSAPs to:

- Scale without a practical upper limit to system provisioning.
- Move to a networked model that integrates data and voice.
- Implement call queues to meet call taker distribution needs.

B. VESTA 9-1-1 Features. The Service uses the VESTA 9-1-1 emergency call handling solution which provides a variety of configurable features including user features, call distribution and ACD features. A subset of these is provided below.

i. User Features.

The VESTA 9-1-1 solution is a purpose built, high capacity, no single point of failure emergency call taking platform. VESTA 9-1-1 is based on a modular architecture which allows components, such as gateways and network switches to be located independently from central controller, creating a flexible platform for configuring systems which meet customer resiliency requirements and installation environment.

The VESTA 9-1-1 User Interface offers custom layouts. These layouts can be designed to meet the requirements of each PSAP, as well as each user role. When Users log into to a selected role, the layout optimized for that role is automatically loaded/displayed. PSAP Administrators create highly functional layouts for each role using a large library of icons, custom colors, fonts, window layouts etc.

The VESTA 9-1-1 emergency call handling system also includes a variety of other features, some of which are discussed below:

- Warm or blind one button transfers.
- Distinctive ring tones on a per line basis, for audible line ringing identification.
- Abundant conferencing features, including adding and dropping participants and quick visualization of the conference through the conferencing window.
- Manual and automatic ALI re-bid and incorrect location reporting.
- Personal, shared and multiple line appearances that use color, icons and call status elements to offer fast identification and quick call status information to users.
- Configured to automatically forward admin line traffic according to business rules.
- Greetings manager which allows call takers to create and manage automated messages. VESTA 9-1-1 also offers a system wide automated messaging for specific queues.
- A high capacity of entry contacts and speed dial system for one click speed dial, contacts may be search at the simple or advanced level for the fastest lookup. Additionally through intelligent speed dialing and selective transfer agencies, speed dials are automatically displayed and dialed based on ESN.
- A configurable ALI display
- Instant Recall Recorder (IRR) & IRR Retrieval: Instant Recall Recorder (IRR) is a telephony, radio, and microphone-based message recording and recorded message handling device. Customer's agents can play back recently completed calls.
- Integrated TTY via Baudot with pre-programmable messages and HCO/VCO capabilities.

ii. Shared Call Appearance (SCA). Call takers can answer a call on a Shared Call Appearance.

iii. Multiple ACD Algorithms (If Activated). The Hosted Services supports Multiple ACD algorithms:

- **Ring all:** Directs the call to all available call takers in the group.
- **Circular:** Directs the call to the next available call taker in round robin fashion within the group.
- **Linear:** Directs the call to the first available call taker within the group with the highest priority setting.
- **Longest Idle:** Presents the call to the longest idle call taker in the group.

CENTURYLINK® 9-1-1 AGREEMENT
CENTURYLINK AIRBUS HOSTED VESTA SERVICE EXHIBIT

- iv. **ACD Functionality (If Activated).** The ACD functionality in the Hosted Service provides multiple features:
- **ACD Queue:** Allows lines and trunks to be assigned to specific queues. Each agent of the Customer can be a member of one or more ACD queues. Customer's agent will receive a call from a queue when they are logged on and ready.
 - **Customer Agent Priority:** Allows a priority to be assigned to each Customer agent in a queue.
 - **Queue Recorded Announcement:** A PSAP-recorded announcement can be played at intervals to callers waiting in a queue.
 - **Not Ready:** Allows Customer's agents to complete tasks from a previous 9-1-1 call before a new call is presented.
 - **Auto Answer:** The console automatically answers an ACD-routed call. The Auto Answer feature contains headset detection for console ACD ready state option. When this option is enabled, the console immediately enters a Not Ready state for ACD calls when the call taker unplugs the headset from the jack box. After the call taker plugs the headset into the jack box, the Ready button must be clicked to enable the call taker to receive ACD calls again.

C. **VESTA™ Analytics Features.** The VESTA Analytics solution provides emergency response center managers and system administrators with information on the volume of calls, performance of Customer agents, and Customer PSAP statistics. The VESTA Analytics solution is a browser-based application that uses information from a database to generate a number of statistical reports.

- i. **Feature Overview.** The VESTA Analytics application features include:
- **Enhanced Operational Management** —Provides the ability to gather, organize, data-mine, and report near real-time information. VESTA Analytics incorporates an advanced data warehouse for improved performance for creating custom reports and searching for data.
 - **Personnel Management** —Includes new 9-1-1 specific key performance indicators (KPIs) that help assess the performance within the call center for more informed decision-making regarding staffing.
 - **Automated Evidence Organization** —Automatically associates related calls, and audio events into the context of individual incidents. This approach simplifies the tasks involved with reconstructing, organizing, searching, and archiving historical incident information.
- ii. **Metrics, Data and Reports.** Through the VESTA Analytics browser-based tool, Customers can access metrics reports on their PSAP. In addition, the VESTA Analytics solution uses pre-processed data to display key performance indicators and activity thresholds for your site through its Dashboard. The Dashboard provides the following:
- Customer Agent Performance Overview
 - Call Center Overview
 - Daily Call Center Overview
 - Dashboard Workbench

**CENTURYLINK® 9-1-1 AGREEMENT
CENTURYLINK AIRBUS HOSTED VESTA SERVICE EXHIBIT**

VESTA Analytics Reports (As of current version 2.4)	
STANDARD REPORTS	STANDARD REPORTS (Cont.)
<u>Caller perspective</u> <ul style="list-style-type: none"> • Call Count by Hour • Call Count by Day • Call Count by Week • Call Count by • Call Count by Quarter • Call Count by Year • Call Count by Call Category • Call Count by Call Types • Call Average by Day vs. Hour • Call Count Comparison by Month • Call Duration • Overflow Count by Queue and Console • Call Count by Wait Time Range 	<u>Trunk/line perspective reports</u> <ul style="list-style-type: none"> • Trunk & Line Utilization by Day vs. Hour
	ADVANCED REPORTS
	<u>Caller perspective reports</u> <ul style="list-style-type: none"> • Abandoned Call Summary • Answer Performance
	<u>Customer's Agent perspective reports</u> <ul style="list-style-type: none"> • Customer's Agent Statistics Comparison Report • Customer's Agent Efficiency Ranking Report • Customer's Agent Offline Count by Offline Time Range
<u>Customer agent perspective reports</u> <ul style="list-style-type: none"> • Customer's Agent Transfer Average by Month • Customer's Agent Ring Count by Ring Time Range 	

Note: Ad hoc reports are not currently supported, and ad hoc reporting functionality will only be provided if available, as reasonably determined by CenturyLink.

D. VESTA™ Locate Features. The VESTA Locate solution is a mapped ALI application installed on each Customer workstation and allows agency personnel to locate 9-1-1 callers and direct emergency responses quickly and accurately. The DataSync application is used to pull updated map data to each workstation. The Customer is responsible for providing, updating and maintaining their map data. The VESTA Locate system features include:

- Incorporating multi-jurisdictional map data without merging data sets.
- ESRI projections for all data layers while preserving original coordinate systems.
- Login-based user right and map views through administrative control.
- Powerful data search tool based on utilizing attributes or spatial buffers.

2.4 Software, Hardware and Services provided for a typical system. The Service includes a variety of options as part of the purchase. A summary of the typical items provided is provided below.

**CENTURYLINK® 9-1-1 AGREEMENT
CENTURYLINK AIRBUS HOSTED VESTA SERVICE EXHIBIT**

AIRBUS DS Communications

CRITICAL MATTERS™

TYPICAL 2-9 POSITION PSAP/

Per Position	Per P&AP	Description
		Software
1		VESTA 9-1-1 Basic Call Handling
	Yes	VESTA Analytics MIS
1		VESTA Locate Mapping
	Yes	DataSync Map Updates
1		IRR
1		Activity View
1		CDR
1		EIM - ESinet Connection via RFA
		Workstation Equipment
1		HP Workstation w/ Tower stand for VESTA
	2	HP Workstation w/ Tower stand for VESTA Analytics & Activity View
1		22" Monitor for VESTA Workstations
	2	22" Monitors for VESTA Analytics & Activity View
1		Generation Keypad w/ 12ft cable
1		Sound Abstration Module (SAM) w/ speaker kit
	1	Color Inkjet Printer (USB) w/ 10 Ft Cable

Per Position	Per P&AP	Description
		Optional Items
Varies	Varies	Command Post
Varies	Varies	ACD (Advanced Call Taking)
Varies	Varies	End User Training
Varies	Varies	Field Engineering Services
Varies	Varies	Project Management Services
Varies	Varies	IP Phones

Per P&AP	Description
	PSAP Backroom Equipment
2	Cisco Switches w/redundancy
2	Voice Modules (Mediant 1000)
1	Mediant Chassis Bundle (includes chassis and redundant power supply)
1	4-Port FXS Gateway
1	TS-4 Serial Port Terminal Server
1	Blackbox TL801AR2 Data Share (Connects two RS232 devices over 1 line)
1	Blackbox TL158AR4 Data Cast (Provides up to 8 connections)
1	19in Equipment Rack
1	NAS Device
Varies	Misc cables and peripheral kits
	RJ45 4FT Cable, Serial cable, Surge Protector, Power Distribution Mount Kit, Wire Management, Rack Shelf, Ground Bar Mount Kit, Patch Panel Equipment
	Support Services
Yes	Airbus Software Support for length of contract
Yes	Hardware Support
Yes	Airbus Monitoring & Response
Yes	Virus Protection
Yes	Security Patch Management
	Implementation Services
Yes	Admin Training
Yes	Airbus Factory Staging
Yes	Cutover Coaching

This is a typical SW, Services and Equipment list. Please refer to a detailed quote from Airbus for full information. Quantities assume a full package is purchased and not ala carte.

AIRBUS DS Communications

CRITICAL MATTERS™

TYPICAL 10-19 POSITION PSAP/

Per Position	Per P&AP	Description
		Software
1		VESTA 9-1-1 Basic Call Handling (or Advanced)
	Yes	VESTA Analytics MIS
1		VESTA Locate Mapping
	Yes	DataSync Map Updates
1		IRR
1		Activity View
1		CDR
1		EIM - ESinet Connection via RFA
		Workstation Equipment
1		HP Workstation w/ Tower stand for VESTA
	2	HP Workstation w/ Tower stand for VESTA Analytics & Activity View
1		22" Monitor for VESTA Workstations
	2	22" Monitors for VESTA Analytics & Activity View
1		Generation Keypad w/ 12ft cable
1		Sound Abstration Module (SAM) w/ speaker kit
	1	Color Inkjet Printer (USB) w/ 10 Ft Cable

Per Position	Per P&AP	Description
		Optional Items
Varies	Varies	Command Post
Varies	Varies	ACD (Advanced Call Taking)
Varies	Varies	End User Training
Varies	Varies	Field Engineering Services
Varies	Varies	Project Management Services
Varies	Varies	IP Phones

Per P&AP	Description
	PSAP Backroom Equipment
2	Cisco Switches w/redundancy
5	Voice Modules (Mediant 1000)
1	Mediant Chassis Bundle (includes chassis and redundant power supply)
1	4-Port FXS Gateway
1	TS-4 Serial Port Terminal Server
1	Blackbox TL801AR2 Data Share (Connects two RS232 devices over 1 line)
1	Blackbox TL158AR4 Data Cast (Provides up to 8 connections)
1	19in Equipment Rack
1	NAS Device
Varies	Misc cables and peripheral kits:
	RJ45 4FT Cable, Serial cable, Surge Protector, Power Distribution Mount Kit, Wire Management, Rack Shelf, Ground Bar Mount Kit, Patch Panel Equipment
	Support Services
Yes	Airbus Software Support for length of contract
Yes	Hardware Support
Yes	Airbus Monitoring & Response
Yes	Virus Protection
Yes	Security Patch Management
	Implementation Services
Yes	Admin Training
Yes	Cutover Coaching
Yes	Airbus Factory Staging

This is a typical SW, Services and Equipment list. Please refer to a detailed quote from Airbus for full information. Quantities assume a full package is purchased and not ala carte.

**CENTURYLINK® 9-1-1 AGREEMENT
CENTURYLINK AIRBUS HOSTED VESTA SERVICE EXHIBIT**

AIRBUS DS Communications

CRITICAL MATTERS™

TYPICAL 20+ POSITION PSAP/

Per Position	Per P&AP	Description
		Software
1		VESTA 9-1-1 Advanced Call Handling
	Yes	VESTA Analytics MS
1		VESTA Locate Mapping
	Yes	DataSync
1		IRR
1		Activity View
1		CDR
1		EIM - EBinet Connection via RFA
		Workstation Equipment
1		HP Workstation w/ Tower stand for VESTA
	2	HP Workstation w/ Tower stand for VESTA Analytics & Activity View
1		22" Monitor for VESTA Workstations
	2	22" Monitors for VESTA Analytics & Activity View
1		Generation Keypad w/ 12ft cable
1		Sound Abatement Module (SAM) w/ speaker kit
	1	Color Inkjet Printer (USB) w/ 10 Ft Cable

Per Position	Per P&AP	Description
		Optional Items
Varies	Varies	Command Post
Varies	Varies	End User Training
Varies	Varies	Field Engineering Services
Varies	Varies	Project Management Services
Varies	Varies	IP Phones

Per P&AP	Description
	PSAP Backroom Equipment
2	Cisco Switches w/ redundancy
10	Voice Modules (Mediant 1000)
2	Mediant Chassis Bundle (Includes chassis and redundant power supply)
1	4-Port FXS Gateway
1	T8-4 Serial Port Terminal Server
1	Blackbox TL801A-R2 Data Share (Connects two RB-232 devices over 1 line)
1	Blackbox TL158A-R4 Data Cast (Provides up to 8 connections)
1	19in Equipment Rack
1	NAS Device
Varies	Misc cables and peripheral kits: RJ45 APT Cable, Serial cable, Surge Protector, Power Distribution Mount Kit, Wire Management, Rack Shelf, Ground Bar Mount Kit, Patch Panel Equipment.
	Support Services
Yes	Airbus Software Support for length of contract
Yes	Hardware Support
Yes	Airbus Monitoring & Response
Yes	Virus Protection
Yes	Security Patch Management
	Implementation Services
Yes	Admin Training
Yes	Outover Coaching
Yes	Airbus Factory Staging

This is a typical SW, Services and Equipment list. Please refer to a detailed quote from Airbus for full information. Quantities assume a full package is purchased and not ala carte.

3. Acronyms

The following acronyms may appear in this document:	Term
ACD	Automatic Call Distribution
ALI	Automatic Location Identification
ANI	Automatic Number Identification
ESN	Emergency Service Number
HCO/VCO	Hearing Carry Over/Voice Carry Over
GIS	Geographic Information System
NROC	Network Reliability Operations Center
TTY	Teletypewriter

4. Monitoring and Maintenance

4.1 Datacenter Support

A. CenturyLink 9-1-1 Network Reliability Operations Center (NROC) uses solution partners/manufacturers Web-based portals to track all manufacturer related 9-1-1 equipment issues. These portals allow CenturyLink to communicate directly with its 9-1-1 equipment manufacturers and prioritize the severity of the repair problem with each manufacturer.

B. The portals will allow CenturyLink to receive hourly, daily, or weekly Service Ticket Alerts via e-mail for additional tracking purposes. The Web-based service and support command center provides CenturyLink with a direct escalation process for open manufacturer issues.

C. Included in our Managed Services offering is monitoring and response from our 9-1-1 equipment manufacturers and contractors. If CenturyLink partners recognize a repair issue at the PSAP site through the remote monitoring process, the partner will open up a ticket with CenturyLink NROC.

4.2 PSAP Support. CenturyLink 9-1-1 technicians provide installation and maintenance support of the Airbus DS Communications VESTA Hosted Emergency Call Handling System Seven (7) days per week, 24 hours per day, 365 Days per year

CENTURYLINK® 9-1-1 AGREEMENT
CENTURYLINK AIRBUS HOSTED VESTA SERVICE EXHIBIT

to the 9-1-1 PSAP Centers. Support will be provided by CenturyLink 9-1-1 technicians, data technicians, network technicians and/or CenturyLink contractors.

4.3 Application Software and Firmware Program Upgrades. Application software and firmware program upgrades are defined as major enhancements to the already purchased product feature/functionality set. A product change is classified as major, in the discretion of CenturyLink and Airbus, based upon the impact of the change to the core functionality of the product. CenturyLink will be notified by an Airbus Product Change Notice, of all application software and firmware program upgrades, which occur within the term of the Service. The local CenturyLink account team will contact the customer to coordinate the upgrade at no additional charge provided that the Service is in effect. Any change in the numbers preceding the decimal point within the product version number constitutes a software program upgrade (for example a change from product version 1.40 to 2.00, or 2.11 to 3.00, or 3.20 to 4.00 et al will represent a software program upgrade).

CENTURYLINK® 9-1-1 AGREEMENT
DOMESTIC CENTURYLINK IQ® NETWORKING SERVICE EXHIBIT

1. General. Domestic CenturyLink IQ® Networking Service (“Service”) is provided by CenturyLink QCC under the terms of the Agreement, this Service Exhibit, and any signed quotes between CenturyLink QCC and Customer.

2. Service.

2.1 Description. Service is a data, IP, and a network management solution that is designed for connectivity between Customer’s sites or public Internet connectivity.

2.2 Ports. CenturyLink offers Service in the following port (“Port”) types:

(a) Internet Port. Internet Ports provide public Internet connectivity.

(b) Private Port. Private Ports provide WAN connectivity between Customer sites. Customer may allocate Private Port traffic up to 10 different closed user groups. Customer may request more than 10 point-to-point closed user groups. Quality of service (“QoS”) traffic prioritization can be used with Private Ports. Ethernet Private Ports with real-time traffic that require QoS are subject to local access limitations.

2.3 Network Management Service. CenturyLink Network Management Service (“NMS”) is a feature available for all Ports. Comprehensive Management is available with domestic Ports. The feature provides performance reporting, change management, configuration management, fault monitoring, management and notification of CPE and network related issues. CenturyLink will provide Select Management with each domestic Port unless (a) Customer notifies its CenturyLink sales representative that Customer opts out of Select Management for that Port or (b) Customer chooses Comprehensive Management for that Port, Customer may also request NMS management features for devices not associated with a CenturyLink IQ Networking Port in domestic locations with CenturyLink’s prior approval. The NMS management types are set forth in more detail below.

(a) Monitor and Notification. Monitor and Notification is included with CenturyLink IQPorts CenturyLink will monitor the Customer devices 24x7x365 for up/down status using ICMP ping. CenturyLink will notify Customer if no response is received for a designated period. NMS will not provide any troubleshooting and incident resolution for device or network faults. “Monitor & Notification” is the only NMS option available for devices that do not support SNMP and/or are not certified for NMS.

(b) Comprehensive Management. Comprehensive Management includes all of the Select Management features as well as total customer agency and change management of complex routing functions within routers, switches, and firewall modules. This includes configuration and management of complex routing, switching, device NIC cards, firewall module configurations, and basic router internal firewall functions. CenturyLink acts as the Customer’s single point of contact in managing the resolution of all service, device, and transport faults covered by Comprehensive Management and will work with any third party hardware and/or transport providers the Customer has under contract until all network issues are successfully resolved. With Internet security protocol (“IPSec”), CenturyLink can configure full mesh, partial mesh, or hub-and-spoke topologies with secure tunnels for remote communication between Customer locations. IPSec is only available on approved Cisco and Adtran devices. IPSec opportunities greater than 25 devices or with other manufacturer’s devices require CenturyLink approval before submitting an order.

(c) CenturyLink Responsibilities. For NMS, CenturyLink will provide Customer with a nonexclusive service engineer team, which will maintain a Customer profile for the portion of the Customer’s network where the devices covered by NMS reside. CenturyLink will work with Customer to facilitate resolution of service affecting issues with Select Management or Comprehensive Management.

(d) Customer Responsibilities.

(i) Customer must provide all information and perform all actions reasonably requested by CenturyLink in order to facilitate installation of NMS. If Customer limits or restricts CenturyLink’s read/write access to a device, CenturyLink cannot support configuration backups. Customer is responsible for supporting CenturyLink in access, troubleshooting, and configuration requests made in accordance with normal troubleshooting and repair support activities.

(ii) For Comprehensive Management, Customer must execute the attached Letter of Agency (Attachment 1) to authorize CenturyLink to act as Customer’s agent solely for the purpose of accessing Customer’s transport services.

(iii) Depending on transport type, Customer’s managed devices must comply with the following set of access requirements: (A) for NMS delivered via IP connectivity with an Internet Port or other public Internet service, devices must contain an appropriate version of OS capable of establishing IPsec VPNs; and (B) for NMS delivered with a Private Port, CenturyLink will configure a virtual circuit to access Customer’s device at no additional charge. CenturyLink will add the NMS network operations center to the Customer closed user group to manage the devices within Customer’s network.

(iv) Customer must provide a routable valid IP address to establish the NMS connection. Customer’s primary technical interface person must be available during the remote installation process to facilitate installation of NMS. All Customer devices managed under NMS

CENTURYLINK® 9-1-1 AGREEMENT
DOMESTIC CENTURYLINK IQ® NETWORKING SERVICE EXHIBIT

must be maintained under a contract from a CenturyLink approved onsite CPE maintenance provider. The response times for which Customer contracts with its CPE maintenance provider will affect CenturyLink's timing for resolution of problems involving Customer provided devices. The performance of the CPE maintenance provider is Customer's responsibility.

2.4 Multicast. Multicast is an optional feature for Private Ports. The feature enables IP multicast on the CenturyLink IP network.

2.5 VPLS. Layer 2 virtual private LAN service ("VPLS") is optional feature for Private Ports only. Private Ports with VPLS are supported on CenturyLink-certified Cisco equipment and are limited to the following connection and encapsulation methods: Ethernet 10 Mbps, 100 Mbps, 1000 Mbps with Ethernet encapsulation; DS1 and DS3 with Frame Relay encapsulation, and OC3 with ATM encapsulation. The following features are not available with Private Ports with VPLS: (a) usage reports; (b) the Precise Burstable or Data Transfer pricing methodologies; (c) the SLA's Reporting Goal; (d) VPN Extensions and (e) End-to-End Performance Reporting.

2.6 VPN Extensions. A VPN Extension is an optional feature for layer 3 multi protocol label switching ("MPLS") Private Ports and Enhanced Ports. The feature allows Customer to extend its Layer 3 MPLS closed user groups to Customer locations that are not served by CenturyLink's MPLS network ("Remote Location"). Customer can establish a tunnel through the Internet between the Customer's CPE at the Remote Location and the CenturyLink network device. The Customer provided CPE must support the CenturyLink service configurations and be installed as designated by CenturyLink or as otherwise agreed upon by the parties. Customer is responsible for the installation, operation, maintenance, use and compatibility of the Remote Location CPE. Customer will cooperate with CenturyLink in setting the initial configuration for the Remote Location CPE interface with the VPN Extension Service. Customer must use IP connectivity at the Remote Location that includes a static public IP address.

(a) Exclusions. CenturyLink will not debug problems on, or configure any internal or external hosts or networks (e.g., routers, DNS servers, mail servers, www servers, and FTP servers). All communication regarding the VPN Extension must be between CenturyLink and a Customer approved site contact that has relevant experience and expertise in Customer's network operations. The following features are not available with VPN Extensions: (i) End-to-End Performance Reporting; (ii) QoS; (iii) VPLS; and (iv) Multicast. VPN Extensions are not subject to the SLA.

2.7 Backbone Prioritization/Priority Queuing. Backbone Prioritization and Priority Queuing is available with individual domestic Private Ports. When this feature is configured on such Port, traffic originating from that Port will be designated at a higher class of service to the CenturyLink IP network than traffic originating from Private Ports without the feature or Internet Ports. The benefit from this feature is realized during periods of high network congestion. The feature may not be available at all locations or with Multicast in certain circumstances.

3. Ordering. For purposes of this Service Exhibit, "Order Form" means an electronic order confirmation process using an architecture confirmation document ("ACD") or other document that Customer and CenturyLink mutually agree to prior to submitting a Service order request. CenturyLink must approve each Order Form and Customer must send it via e-mail, fax, or other CenturyLink-approved electronic process to CenturyLink. Subject to availability, CenturyLink will assign /29 Internet address space for Customer during the use of a Port. Neither Customer nor any End Users will own or route these addresses. Upon termination of Service, Customer's access to the IP addresses will cease. If Customer requests special sequencing for Port installation, Customer must designate a Key Port. A "Key Port" is a Port that must be available on the network before adding additional domestic Port locations. The installation of the Key Port will determine the timelines for the installation of other domestic Ports. Customer may designate one Key Port within its CenturyLink IQ Networking network topology by notifying CenturyLink in writing of that request. Unless the parties otherwise agree in writing, Customer has sole responsibility for ordering, securing installation and ensuring proper operation of any and all equipment required to enable Customer to receive the Service.

4. Charges. Customer must pay all applicable MRCs and NRCs set forth in an attached pricing attachment, offer attachment, or a valid signed CenturyLink issued quote. Charges will commence within five days after the date CenturyLink notifies Customer that Service is provisioned and ready for use ("Start of Service Date"). Customer may order multiple Ports with multiple pricing methodologies in accordance with the pricing methodologies set forth below. Customer may change the pricing methodology (e.g., from Flat Rate to Precise Burstable) of a Port if: (a) the Port's new MRC remains the same or greater than the old MRC, and (b) the Port starts a new Service Term that is equal to or greater than the remaining number of months in the old Service Term, subject to a 12 month minimum. CenturyLink may change rates after the completion of a Port's Service Term with 60 days' notice. The net rate MRCs set forth in the pricing attachment, offer attachment or valid signed CenturyLink issued quote will be used to calculate Contributory Charges. Net rate MRCs are lieu of all other rates, discounts, and promotions. The End-to-End Performance Reporting, VPN Extension, SIG and Multicast features are provided on a month-to-month basis and either party may cancel a feature with 30 days' prior written notice to the other party. CenturyLink may upon 30 days prior written notice to Customer modify those features, including without limitation, their rates.

4.1 Pricing Methodologies.

(a) Flat Rate. The Flat Rate pricing methodology bills Customer a specified MRC for a given Port speed regardless of Customer's actual bandwidth utilization.

(b) Precise Burstable. Usage samples are taken every five minutes throughout the monthly billing cycle. Only one sample is captured for each five-minute period, even though there are actually two samples taken; one for inbound utilization and one for

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outbound utilization. The higher of these two figures is retained. At the end of the billing period, the samples are ordered from highest to lowest. The top 5% of the samples are discarded. The highest remaining sample is used to calculate the usage level, which is the 95th percentile of peak usage. For each Precise Burstable Port, Customer will pay an MRC calculated by multiplying Customer's 95th percentile of peak usage in a given month by the applicable MRC per Mbps. There is a minimum usage amount within each Precise Burstable Port classification ("Precise Burstable Minimum"). Customer will be billed the greater of the Precise Burstable Minimum or the actual charges based upon its 95th percentile of peak usage.

5. Term; Cancellation.

5.1 Term. The term of an individual Port (and associated features/Services, if applicable) begins on the Start of Service Date for that Port and continues for (a) the service term shown on the valid signed CenturyLink issued quote or the pricing attachment or (b), three years for other domestic Ports (each a "Service Term"). If Service is installed at multiple Customer locations or with multiple Ports at a Customer location, each separate Port (and associated features/Services) will have its own Start of Service Date. Upon expiration of a Service Term, CenturyLink IQ domestic Ports (and associated features/Services) will remain in effect on a month-to-month basis until canceled by either party with 60 days' notice.

5.2 Cancellation. Upon cancellation of a Service, Customer will remain liable for charges accrued but unpaid as of the cancellation date. If a Port and associated features/Services is canceled by Customer other than for Cause, or by CenturyLink for Cause, before the conclusion of its Service Term or Upgrade Service Term (as described in the "Upgrades" section), Customer will pay a "Cancellation Charge" equal to:

(a) Domestic Internet Port, Private Port or Enhanced Ports: (i) 100% of the Port and NMS MRCs multiplied by the number of months remaining in the first 12 months of the initial Service Term (or Upgrade Service Term), if any, plus (ii) 35% of the balance of those MRCs multiplied by the number of months remaining to complete the initial Service Term (or Upgrade Service Term) beyond the first 12 months, plus (iii) the amount of any NRCs discounted or waived if the Port has not remained installed for at least 12 months.

5.3 Waiver of Cancellation Charges.

(a) **Upgrades.** CenturyLink will waive the Cancellation Charges for a domestic Port if Customer: (i) upgrades a Port to another Port with a higher bandwidth (e.g., from a DS1 to a DS3) within the same pricing methodology and the new Port's MRC (with Local Access) is equal to or greater than the combined MRCs of the Port and the associated Local Access Service being terminated; (ii) upgrades the Port type to a higher Port type (e.g., from an Internet Port to a Private Port) within the same pricing methodology. All upgraded Ports must start a new Service Term equal to or greater than the replaced Port's remaining Service Term, subject to a 12 month minimum ("Upgrade Service Term"). If Customer cancels the upgraded Port before the completion of the Upgrade Service Term, Customer will pay the Cancellation Charges set forth in the Cancellation section above. In some cases an upgrade to a Port may trigger a Local Access charge under the Local Access Service Exhibit. (b) **Migration to Other CenturyLink Services.** CenturyLink will waive the Cancellation Charges for a domestic Port if Customer migrates the Port to new Analog VoIP Service or Data Bundle Solutions (a "New Service") as long as: (i) the New Service's MRC is equal to or greater than the combined MRCs of the Port and the associated Local Access Service being terminated; (ii) the New Service's minimum service term is at least as long as the then remaining Service Term of the Port being terminated; and (iii) the New Service is available.

6. Additional Disclaimer of Warranty. In addition to any other disclaimers of warranty stated in the Agreement, CenturyLink makes no warranty, guarantee, or representation, express or implied, that all security threats and vulnerabilities will be detected or that the performance of the Services will render Customer's systems invulnerable to security breaches. Customer is responsible for Customer's own network security policy (including applicable firewall and NAT policies) and security response procedures.

7. E-mail Notification. Customer acknowledges and agrees that CenturyLink may contact Customer via e-mail at the e-mail address provided to CenturyLink when Customer ordered the Service for any reason relating to the Service, including for purposes of providing Customer any notices required under the Agreement. Customer agrees to provide CenturyLink with any change to its e-mail address.

8. AUP. All use of the Services must comply with the AUP located at <http://www.centurylink.com/legal/>, which is subject to change. CenturyLink may reasonably change the AUP to ensure compliance with applicable laws and regulations and to protect CenturyLink's network and customers. Any changes to the AUP will be consistent with the purpose of the AUP to encourage responsible use of CenturyLink's networks, systems, services, Web sites, and products.

9. SLA. Unless a Port is part of the Managed ESInet Bundle described in this Agreement, Ports other than CenturyLink IQ + Ports are subject to the CenturyLink IQ Networking Service Level Agreement ("SLA"), CenturyLink IQ + Ports are subject to the CenturyLink IQ + Port SLA and the NMS feature is subject to the NMS SLA. Each SLA is located at <http://www.centurylink.com/legal/> and subject to change. For Customer's claims related to Service or NMS feature deficiencies, interruptions or failures, Customer's exclusive remedies are limited to those remedies set forth in the applicable SLA.

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ATTACHMENT 1

COMPREHENSIVE MANAGEMENT

LIMITED LETTER OF AGENCY

**between
("Customer")
and**

CenturyLink Communications, LLC f/k/a Qwest Communications Company, LLC ("CenturyLink")

This limited letter of agency ("LOA") hereby authorizes CenturyLink to act as the Customer's agent for the limited purpose of contacting Customer's designated Local Exchange Carrier ("LEC"), Interexchange Carrier ("IXC"), Internet Service Provider ("ISP"), or customer premises equipment ("CPE") maintenance provider in conjunction with CenturyLink Network Management Service. Network Management Service activities will consist of working with Customer's LEC, IXC, ISP, and/or CPE maintenance provider for the purpose of: (a) extracting information concerning transmission data elements carried over Customer's network connection; (b) identifying Customer's links or data link connection identifiers ("DLCIs"); (c) opening, tracking, and closing trouble tickets with the LEC, IXC, ISP, or CPE maintenance provider on Customer's transport links or CPE when an alarm or fault has been detected; (d) dispatching CPE repair personnel on behalf of Customer to CPE for which a fault has been detected; and (e) discussing fault information with the LEC, IXC or CPE maintenance provider on behalf of Customer to facilitate resolution of the problem.

CenturyLink does not assume any of Customer's liabilities associated with any of the services the Customer may use.

The term of this LOA will commence on the date of execution below and will continue in full force and effect until terminated with 30 days written notice by one party to the other or until the expiration or termination of the Network Management Service.

A copy of this LOA will, upon presentation to LEC, IXC, ISP, and/or CPE maintenance provider, as applicable, be deemed authorization for CenturyLink to proceed on Customer's behalf.

Customer Company Name

Authorized Signature of Customer

Print or Type Name

Title

Date

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1. General. CenturyLink QCC will provide Local Access Service ("Service") under the terms of this Service Exhibit, the Agreement and the RSS.

2. Service Description and Availability.

2.1 Description. Service provides the physical connection between the Service Address and the CenturyLink Domestic Network. Service includes any entrance cable or drop wire to, and equipment maintained by CenturyLink at the Demarcation Point. All equipment owned by CenturyLink remains property of CenturyLink. Customer disclaims any interest in any equipment, property or licenses used by CenturyLink to provide Service. CenturyLink will not provide Service to a residential location, even if business is conducted at that location. Service is not a standalone service and Customer must have the Service in connection with another CenturyLink service for which a local loop is required.

2.2 Types of Service Technologies. CenturyLink uses the following different technologies to provide Service. Some technologies or speeds may not be available in all areas or with certain types of Service.

(a) Special Access. "Special Access" means Service using digital signal bandwidths DS0, DS1 and DS3 or Optical Carrier signal bandwidths OC3, OC12, OC48 and OC192.

(b) Ethernet Local Access ("ELA"). ELA is available at bandwidths varying from 1 Mbps to 1,000 Mbps (1G) and 10G (Cross-Connect Access only). ELA is available in the following options: Native Single-Class-of-Service (CoS) Low, Native Single-CoS Medium, Native Single-CoS High, Native Multi-CoS, ELA over SONET, or Ethernet Virtual Access ("EVA"). "Native Single-CoS Low" is a layer 2, switched, native service using a standard Ethernet offering from the local access provider. Native Single-CoS Low is not recommended for use with critical applications (i.e. voice), but is ideal for non-critical applications (i.e. Internet and email traffic). "Native Single-CoS Medium" is a layer 2, switched, native service using a better-than-standard Ethernet offering from the local access provider. Native Single-CoS Medium is ideal for a combination of non-critical and/or critical applications; typically varying voice, video, and data. "Native Single-CoS High" is a layer 2, switched, native service using the best Ethernet offering from the local access provider. Native Single-CoS High is ideal for critical applications; typically predictable and reliable voice and data. Native Single-CoS Medium and Native Single-CoS High are only available with the following CenturyLink services: CenturyLink IQ® Networking Internet Port, Private Port or Enhanced Port with Secure Internet Gateway, E-Line, or Ethernet Private Line ("EPL"). Native Single-CoS Medium or Native Single-CoS High circuit speed must match the maximum CenturyLink IQ Networking port, E-Line, or EPL bandwidth. "Native Multi-CoS" is a layer 2, switched, native service closely aligning the CenturyLink IQ Networking QoS and the local access provider's Ethernet class of service offering and is only available with CenturyLink IQ Networking Private Port or Enhanced Port with Secure Internet Gateway. At Customer's discretion, Native Single-CoS Low, Native Single-CoS Medium, Native Single-CoS High, or Native Multi-CoS may be used to support CoS for critical applications (i.e. voice). "ELA over SONET" is a layer 1, SONET-based service. EVA is a layer 2, Ethernet-based service that provides customers with a premium non-oversubscribed connection with Fast E and Gig E connection types. Customer may experience delayed installation intervals due to construction requirements and available bandwidths may be limited due to distance and available Ethernet-supported facilities from the local access provider.

(c) Wavelength Local Access. "Wavelength Local Access" means Service using wave division multiplexing technology. Wavelength Local Access is available at bandwidths of 1 GbE, 10 GbE LAN PHY, 2.5 G (OC48), 10 GbE WAN PHY (OC192), 40G, OTU1, OTU2, OTU3, 1G, 2G, 4G and 10G.

(d) DSL Local Access. "DSL Local Access" means Leased Access using digital subscriber line ("DSL") technology. DSL Local Access is available at bandwidths varying from 128 kbps/64 kbps to 15000 Mbps/1000 Mbps. Customer may experience delayed installation intervals due to Construction requirements and available bandwidths may be limited due to distance and available DSL-supported facilities from the local access provider.

(e) IP Connection. "IP Connection" is a Layer 3, symmetrical transport service that utilizes established dedicated IP and MPLS transport technologies. Customer agrees that it will use the IP Connection only for the provision of either (i) Wireline broadband Internet access (as defined in applicable Federal Communications Commission orders and regulations), or (ii) Wireline broadband Internet access plus additional information services, with Wireline broadband Internet access constituting a principal use. IP Connection provides connectivity between single Customer locations within an affiliate LEC metropolitan area and a "hub" location using industry standard dedicated IP and MPLS protocols. The transmission speed depends on the amount of bandwidth available at the respective Customer location, which may be dependent on available underlying technology at the location. Service is available over multiple designs, which may include but not be limited to symmetrical VDSL2 connectivity with MPLS transport supporting speeds up to 40/40mg and symmetrical GPON connectivity with MPLS transport supporting speeds up to 1G/1G, all providing an IP Connection over the given transport solution.

2.3 Types of Service. CenturyLink offers the following three types of Service: CenturyLink Provided Access, Customer Provided Access or Cross-Connect Access.

2.3.1 CenturyLink Provided Access. "CenturyLink Provided Access" or "CLPA" means either On-Net Access or Leased Access.

(a) On-Net Access. For On-Net Access, Customer must be located in a CenturyLink designated building in which On-Net Access is generally available. On-Net Access is generally available as Special Access (except at the DS0 bandwidth), ELA, and Wavelength Local Access. Depending on the Service Address, On-Net Access may be provided through an existing CPOP, newly built CPOP, existing intra-building local loop facilities, or connections to a third party provider where CenturyLink coordinates the connectivity

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between CenturyLink facilities and facilities of a service provider with whom CenturyLink is interconnected. On-Net Access is subject to the On-Net Service Level Agreement located at <http://www.centurylink.com/legal/>, which is subject to change.

(b) Leased Access. Leased Access is generally available as Special Access, ELA, Wavelength Local Access and DSL Local Access at the bandwidths described in this Service Exhibit for those access types. Customer may request a specific local access provider for Leased Access from a list of available providers with whom CenturyLink has interconnect agreements. CenturyLink will attempt to use the Customer requested provider, but both final routing and the provider actually used will be chosen by CenturyLink. Where available for Special Access, ELA and Wavelength Local Access, Customer may request CenturyLink to provide a separate fiber facility path for a protection system between the local access provider's serving wire center and the Service Address ("Protect Route"). Protect Route uses backup electronics and two physically separate facility paths in the provisioning of Service. If the working facility or electronics fail, or the Service performance becomes impaired, the facility is designed to automatically switch to the Service protect path in order to maintain a near-continuous flow of information between locations. Special Access and ELA are also generally available as a central office meet point at a local access provider central office to which Customer has a dedicated connection.

2.3.2 Customer Provided Access. "Customer Provided Access" or "CPA" means a local loop that Customer orders from a local access provider to connect Customer's premises to the CenturyLink Domestic Network at a connection point specified by CenturyLink. CenturyLink will provide Customer with a limited letter of agency ("LOA"), which is incorporated by this reference, authorizing Customer to act as CenturyLink's agent so that Customer's local access provider will connect Customer's premises to the CenturyLink Domestic Network. Customer will also need to execute a CPA-DAR Addendum for CPA POP with ELA or Wavelength Local Access. Customer will pay a CPA charge to CenturyLink when Customer uses the following: (a) Special Access CPA dedicated facilities or ELA CPA virtual local area network ("VLAN"), both of which are dedicated entrance facilities CenturyLink leases from a local access provider and that carry traffic only from CenturyLink; or (b) ELA CPA POP, which requires CenturyLink to provide space and power for the local access provider to install Ethernet equipment; or (c) Wavelength Local Access. Customer will pay a CPA charge to CenturyLink when Customer uses Special Access CPA non-dedicated facilities owned by local access providers and that carry traffic from multiple carriers, including CenturyLink, if the provider charges CenturyLink for those facilities. CPA ELA VLAN is an access type where CenturyLink will provision and assign an Ethernet virtual circuit from a CenturyLink POP to a Customer designated Ethernet facility leased from a common Ethernet service provider. This access will be used to connect to a CenturyLink VLAN assignment on a CenturyLink IQ Networking Internet or Private Port or E-Line. CenturyLink will not bill customer a CPA charge for an IP layer 3 expansion site because Customer, not CenturyLink, is responsible for ordering a cross-connect from the IP layer 3 expansion site manager to meet CenturyLink in the IP layer 3 expansion site's meet-me-room. CPA is the responsibility of Customer and CenturyLink will not pay for or troubleshoot components of CPA.

2.3.3 Cross-Connect Access. "Cross-Connect Access" or "XCA" means: (a) an intra-POP connection between certain Customer facilities with direct access to the CenturyLink Domestic Network and the CenturyLink backbone access point (either (i) located within CenturyLink's transport area where CenturyLink allows Customer to bring its own fiber directly to the CenturyLink fiber under an executed Direct Connect Agreement ("Direct Connect") or (ii) in an area where Customer has leased space in a CPOP, a remote collocation site, or a collocation hotel under a Telecommunications Collocation License Agreement or (b) a connection between a CenturyLink-determined data center and a CenturyLink IQ Networking Port, Optical Wavelength Service ("OWS"), or E-Line ("Data Center Access") under an executed CenturyLink TS Service Exhibit with a CenturyLink IQ Networking, OWS or E-Line Service Exhibit. Data Center Access is available in bandwidths of 100 Mbps, 1G, and 10G (CenturyLink IQ Networking and OWS only). Direct Connect requires splicing of Customer and CenturyLink fibers and cross-connection of individual circuits.

2.4 RSS. Customer understands that Service is an interstate telecommunications service, as defined by Federal Communications Commission regulations and represents while using the Service, more than 10% of its usage will be interstate usage.

3. Ordering. Upon acceptance of an order for a Service, CenturyLink will notify Customer of CenturyLink's target date for the delivery of that Service ("Estimated Availability Date"). Once CenturyLink notifies Customer of the Estimated Availability Date for a Service, cancellation fees or Cancellation Charges set forth in the Cancellation section below will apply to any cancellation of that order. If Customer fails to respond to CenturyLink's requests to arrange for the installation of a Service when CenturyLink is ready, CenturyLink may consider the affected Service order canceled. CenturyLink will use commercially reasonable efforts to install each such Service on or before the Estimated Availability Date, but the inability of CenturyLink to deliver Service by such date is not a default under the Agreement or this Service Exhibit.

4. Charges. Customer will pay the net rates set forth in the attached pricing attachment or a quote for Service issued by CenturyLink if the rates for Service at particular Service Address are not included in the pricing attachment, including all applicable ancillary service charges. CenturyLink invoices MRCs in advance and NRCs in arrears. If the Start of Service Date for any Service falls on any day other than the first day of the month, the first invoice to Customer will consist of: (a) the pro-rata portion of the applicable MRC covering the period from the Start of Service Date to the first day of the subsequent month; and (b) the MRC for the following month. Charges for Service will not be used to calculate Contributory Charges. Customer will receive the rates for Service as shown on the pricing attachment regardless of whether an NPA/NXX split or overlay occurs.

4.1 Ancillary Charges. Ancillary charges applicable to Service include but are not limited to those ancillary services set forth in this section. If an ancillary charge applies in connection with provisioning a particular Service, CenturyLink will notify Customer of the ancillary charge to be billed to Customer. Customer may either approve or disapprove CenturyLink providing the ancillary service.

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(a) Expedite. A local loop expedite charge applies to orders where Customer requests the delivery of Service one or more days before the Estimated Availability Date. Customer may only request to expedite CenturyLink Provided Access of Special Access and ELA orders (where underlying local access provider allows CenturyLink QCC to order an expedited service.)

(b) Extended Wiring. "Extended Wiring" means additional wiring required for orders where the Customer requested termination point for Service is not located in the same location as the Demarcation Point. The Demarcation Point is typically located at a suitable location in the basement or on the first floor of a Service Address where provision is made for termination of CenturyLink's outside distribution network facilities. Customer may only request Extended Wiring for (i) Special Access ordered as Leased Access, (ii) DSL Local Access, (iii) Ethernet Local Access (where available), and (iv) IP Connection.

(c) Construction. Construction charges apply if special construction is required to extend Service to a Demarcation Point not covered by Extended Wiring or other activities that may cause CenturyLink to incur expenses for provisioning the Service (e.g., special arrangements of LEC facilities or equipment required to activate the Service) ("Construction"). If Customer does not approve of the Construction charges after CenturyLink notifies Customer of the charges, the Service ordered will be deemed cancelled.

(d) Multiplexing. Customer may request multiplexing for Special Access where available. CenturyLink will multiplex lower level local loop into a higher local loop, or vice-versa, for an additional charge. CenturyLink offers multiplexing at a CPOP, at an On-Net Access building or at an ILEC/CLEC facility providing the Leased Access. For multiplexing at a CenturyLink On-Net Access building, CenturyLink provides multiplexed circuit handoffs to Customer at the same On-Net Access Service Address. For multiplexing at ILEC/CLEC facility, CenturyLink facilitates the delivery of multiplexed circuit handoffs to Customer at a single Service Address or at multiple Service Addresses per Customer's request. Multiplexing is generally available at DS1 and OCn circuit levels. Pricing for multiplexing at an ILEC/CLEC facility is on an individual case basis.

(e) Changes. Ancillary change charge applies where Customer requests CenturyLink to change a local loop to a different Service Address that is within the same Customer serving wire center as the existing local loop, but a Cancellation Charge does not apply.

5. Term; Cancellation.

5.1 Term. The term of an individual Service begins on the Start of Service Date for that Service and continues for the number of months specified in the attached pricing attachment for a particular Service Address or a quote for Service issued by CenturyLink if the rates for Service at particular Service Address are not included in the pricing attachment ("Initial Service Term"). Excluding voice loops and Data Center Access with a month-to-month Initial Service Term, the Initial Service Term will not be less than 12 months. Upon expiration of the Initial Service Term, Service will automatically renew for consecutive periods equal to the Initial Service Term length (a "Renewal Service Term"). CenturyLink may change rates at any time after the Initial Service Term, but will not change rates more than once during a Renewal Service Term.

5.2 Cancellation. Upon cancellation of a Service, Customer will remain liable for (a) charges accrued but unpaid as of the cancellation date (including MRCs, NRCs and Construction charges and other ancillary charges), (b) the amount of any NRCs that CenturyLink discounted or waived, if canceled during the first 12 months of the Initial Service Term and (c) any applicable cancellation fees and Cancellation Charges as set forth below.

(a) All Service Types—Cancellation After the Start of Service Date. If a Service is canceled by Customer other than for Cause, or by CenturyLink for Cause, before the conclusion of its Initial Service Term, Customer will pay a "Cancellation Charge" equal to: (i) 100% of the balance of the MRCs that otherwise would have become due for the unexpired portion of the first 12 months of the Initial Service Term, if any, plus (ii) 35% of the balance of the MRCs that otherwise would have become due for the unexpired portion, if any, of the Initial Service Term beyond the first 12 months.

(b) Moves. When Customer requests that CenturyLink move a local loop to a different Service Address that is not within the same Customer serving wire center as the existing local loop such move will be deemed a disconnect of the current local loop to which a Cancellation Charge applies and a new install of a new local loop.

(c) Waiver of Cancellation Charges. CenturyLink will waive the Cancellation Charge for a cancelled Service:

- (i) When Customer cancels a Special Access ordered as Leased Access if it is (A) DS3 or less, (B) is not part of a bundle or package offering that required Customer to order the local loop with other service components and (C) the local loop's Start of Service Date was at least 12 months prior to the requested date of cancellation.
- (ii) When Customer upgrades existing Special Access, Native Single-CoS Low/Medium/High, Native Multi-CoS, ELA over SONET, or Wavelength Local Access ("Existing CLPA Service") with new Service within the same specific type of Service technology at a higher Service speed (e.g., Special Access DS1 to Special Access DS3 or Native Single-CoS Low Fast E to Native Single-CoS Low Gig E) and with the same local access provider ("Upgraded CLPA Service"). The Upgraded CLPA Service will have a new Service Term beginning on its Start of Service Date. If the type of Service technology changes when Customer upgrades Existing CLPA Service, Customer must pay Cancellation Charges.

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(d) Customer Provided Access—Cancellation of Connectivity after Start of Service Date. To cancel CPA, Customer must provide CenturyLink with a written disconnect firm order confirmation (“DFOC”) notice from Customer’s CPA provider along with notice to cancel the CPA. If Customer fails to provide CenturyLink with the DFOC notice within 30 calendar days after CenturyLink’s receipt of the notice to cancel the CPA, or if CenturyLink disconnects CPA for Cause, then CenturyLink may disconnect the CPA or require the CPA provider to do so. Customer will remain liable for charges for the connectivity to CPA (even if Customer cannot use the CPA) until: (i) Customer furnishes the required DFOC to CenturyLink; or (ii) either party cancels the associated CPA with the CPA provider.

6. Grooming. If CenturyLink plans to groom a circuit on which Service is provided, CenturyLink will provide a grooming notice to Customer. For CPA dedicated facilities grooming, Customer will provide a signed LOA to CenturyLink so that CenturyLink can order the necessary changes. Within 20 calendar days after receipt of that notice, Customer will: (a) notify CenturyLink of its approval, which may not be unreasonably withheld; (b) state its reason for refusing; or (c) request that CenturyLink provide Customer with an LOA so Customer can order the necessary changes. Customer’s failure to respond within the 20-day period will constitute approval of the groom. If the groom results in Customer incurring additional NRCs from its local access provider and Customer provides sufficient proof of the local access provider charge, CenturyLink will issue a credit to Customer equal to the local access provider NRC for each groomed circuit. If Customer refuses the groom for On-Net Access, CenturyLink will, upon 20 calendar days’ prior written notice, cancel the Service on that circuit and assess a Cancellation Charge. When Customer does not respond to a CPA dedicated facilities grooming notice or refuses a CPA dedicated facilities groom, Customer must either: (a) provide CenturyLink with a LOA/CFA so that CenturyLink can have the local access provider cancel the circuit; or (b) work directly with the local access provider to cancel the circuit. If Customer does neither of these things, CenturyLink will pass through to Customer any costs incurred by CenturyLink from the local access provider as a result of the circuit remaining in place. “CFA” means circuit facility assignment of the CenturyLink facility, as identified by CenturyLink, to which Customer must order a local loop for connection to the CenturyLink Domestic Network.

7. Definitions. Capitalized terms not defined in this Service Exhibit are defined in the Agreement.

“CenturyLink Domestic Network” means the CenturyLink network located within the contiguous U.S. states and Hawaii, which is comprised only of physical media, including switches, circuits, and ports that are operated by CenturyLink.

“CPOP” means a CenturyLink-owned physical point of presence that lies directly on the CenturyLink Domestic Network where direct interconnection between the CenturyLink Domestic Network and a local access provider’s network is possible.

“Demarcation Point” means: (a) the physical interface between the CenturyLink Domestic Network and Customer’s telecommunications equipment or (b) the physical interface between a local access provider connecting the CenturyLink Domestic Network to Customer’s telecommunications equipment.

“Leased Access” means local backbone access circuits ordered and leased by CenturyLink from a local access provider chosen by CenturyLink.

“On-Net Access” means local backbone access circuits provided solely on CenturyLink owned and operated facilities.

“Service Address” means the business building where Customer receives the Service.

“Start of Service Date” for each circuit is the date Customer accepts the circuit, following notification by CenturyLink that the local loop is ready. The ready notification will be via phone call or e-mail. Customer has five days from CenturyLink’s ready notification in which to inform CenturyLink if the circuit fails to operate error-free. Within the five-day timeframe, if Customer neither informs CenturyLink about errors nor accepts the circuit, the circuit will be considered to have been accepted and the Start of Service Date to have commenced on the fifth day following CenturyLink’s ready notification, regardless of whether Customer placed traffic over the circuit. If Customer informs CenturyLink of circuit errors within the five-day timeframe, CenturyLink will promptly take necessary, reasonable action to correct the errors, and upon correction, notify Customer that the circuit is ready.

**CENTURYLINK® 9-1-1 AGREEMENT
DOMESTIC NETWORK DIVERSITY SERVICES EXHIBIT**

1. General; Definitions. Capitalized terms not defined in this Service Exhibit are defined in the Agreement. CenturyLink QCC will provide Domestic Network Diversity enhancements ("Service" or "Diversity") to underlying services in the continental United States under the terms of the Agreement, RSS, and this Service Exhibit.

"Card Diversity" means the secondary or diverse circuit that originates and/or terminates onto a separate card on the same device within the same CenturyLink POP as the primary circuit.

"Dedicated IP Access" means a special access local loop connection, from the Customer premises to an IP POP ("POP").

"Device Diversity" means the secondary or diverse circuit that originates and/or terminates in a separate aggregation device (such as routers, switches) within the same IP POP as the primary service.

"ELA" or "Ethernet Local Access" means CenturyLink Provided Access using Ethernet over SONET technology and is available at bandwidths varying from 1 Mbps to 1,000 Mbps (1Gbps).

"IP POP" is a CenturyLink POP where IP edge routers are located on the CenturyLink Domestic Network and Networking Service is available.

"IP POP Diversity" means the diverse circuit that originates and/or terminates in a physically separate IP POP from the primary circuit. "CenturyLink POP" means a point of presence ("POP") on the CenturyLink Domestic Network.

"CenturyLink Domestic Network" means the CenturyLink operated facilities located within the 48 contiguous states that consist of transport POPs, physical media, switches, circuits, and/or ports that are operated solely by CenturyLink.

"Single Circuit Diversity" unless otherwise stated in this Service Exhibit, means an individual circuit on the CenturyLink Domestic Network that either: (a) is routed to, or; (b) avoids a specified geographic location along the circuit's path between the originating and terminating CenturyLink transport POP buildings, subject to availability.

"SLA" means the service level agreement specific to the Service, located at <http://www.centurylink.com/legal/>, which is subject to change.

"Special Access" means CenturyLink Provided Access using Digital Signal speeds DS-0, DS-1, and DS-3 or Optical Carrier signal speeds OC-3, OC-12, OC-48, and OC-192.

"Switch Diversity" means the secondary or diverse circuit that originates and/or terminates in a separate CenturyLink switch from the primary circuit. Depending on available network facilities, the circuits may originate and/or terminate at the same or different CenturyLink POP.

"Transport Diversity" means two or more diversely related circuits that are independently routed on the CenturyLink Domestic Network transport systems between the originating and terminating CenturyLink POP buildings, subject to availability. At Customer's request and subject to availability, CenturyLink will provision diversely related Underlying Services from different CenturyLink POP buildings in the originating and/or terminating cities. In some instances, the diverse circuit may share common network facilities, infrastructure, and/or buildings with the primary circuit.

"Underlying Service" means an approved CenturyLink service offering on the CenturyLink Domestic Network that also supports Diversity.

2. Service.

2.1 Description. Diversity is an enhanced routing option that routes an Underlying Service according to either: (a) a Customer-defined routing between two or more diversely related circuit(s); or (b) a predefined path that either routes to or avoids a specified geographic location on the circuit path ("Single Circuit Diversity") according to Customer's requirements, unless otherwise noted below; and (c) identifies and maintains the diversely routed circuit(s) in the CenturyLink provisioning systems, until the Service is cancelled. Diversity does not provide switching and/or routing of Customer's digital transmissions between primary and diversely routed circuits in the event of a failure on any one circuit or port. CenturyLink only offers protection switching, if any, inherent with the Underlying Services. The Diversity options described in this Service Exhibit are subject to availability and technical feasibility. The SLA is effective as of the first day of the second month after initial installation of Service. The SLA provides Customer's sole and exclusive remedy for service interruptions or service deficiencies of any kind whatsoever for the Service. CenturyLink's Underlying Services include: Domestic Private Line Service, EPL, Optical Wavelength Networking Service (including Internet Ports, Private Ports, and Enhanced Ports), ATM Service, Frame Relay Service, Dedicated Domestic Outbound/Inbound Long Distance Service ("Long Distance"), and related Local Access Service. The Underlying Services will, except to the extent modified in this Service Exhibit, be offered pursuant to the terms and conditions of the Agreement, Service Exhibits, and/or RSS applicable to the Underlying Services.

2.2 Diversity Configurations. Diversity configurations vary based on the Underlying Service. See below for options, subject to available network facilities. In situations where network facilities are not available, CenturyLink offers Customer the option to specifically order diversity on an individual case basis

**CENTURYLINK® 9-1-1 AGREEMENT
DOMESTIC NETWORK DIVERSITY SERVICES EXHIBIT**

(a) Domestic Private Line Diversity Service. Domestic Private Line Diversity Service is offered at DS-1, DS-3, OC-3, OC-12, and OC-48 transmission rates. CenturyLink does not offer DS-0 and Fractional DS-1 Domestic Private Line Diversity Services. CenturyLink's routing of the diverse Domestic Private Line circuit(s) is based on the route of the designated working path of the circuit(s). Domestic Private Line Diversity Service is offered in the following configurations, but not in combination: Single Circuit Diversity or Transport Diversity. In some instances, the diverse circuit may share common network facilities, infrastructure, and/or buildings with the primary circuit.

(b) EPL Diversity Service. EPL Diversity Service is offered at 50 Mbps, 100 Mbps, 150 Mbps, 600 Mbps, and 1000 Mbps transmission rates. CenturyLink's routing of the diverse EPL circuit(s) is based on the route of the designated working path of the circuit(s). EPL Diversity Service is offered in the following configurations, but not in combination: Single Circuit Diversity or Transport Diversity.

(c) Optical Wavelength Diversity Service. Optical Wavelength Diversity Service is offered as an unprotected point-to-point transmission path between an originating and terminating CenturyLink POP at 1 GbE, 2.5 Gbps and 10 Gbps transmission rates. Optical Wavelength Diversity Service is offered in the following configurations, but not in combination: Single Circuit Diversity or Transport Diversity.

(d) Networking Diversity Service. Networking is offered at DS-1, IMA (2xDS-1 up to 8xDS-1s)*, DS-3, OC-3, OC-12, and OC-48 transmission rates. Networking Diversity Service is offered in the following configurations but not in combination: POP Diversity (Single Circuit or Primary and Diverse Circuit), Device Diversity, or Card Diversity. Networking Single Circuit Diversity on the CenturyLink Domestic Network means a circuit that is routed to a specified IP POP. The secondary or diverse circuit cannot be used to load-balance Customer's traffic. The secondary or diverse circuit may share common network facilities, infrastructure, and/or buildings with the primary circuit.

2.3 Local Access Diversity Service. Local Access Diversity Service is an enhancement to Local Access that: (a) routes circuits based on Customer's reasonable routing requirements; and (b) identifies and maintains the Local Access circuits as diversely routed circuits in the CenturyLink provisioning systems. Local Access Diversity Service is offered with: (c) Special Access at DS-1, 2xDS-1 up to 8xDS-1*, DS-3, OC-3, OC-12, and OC-48 transmission rates; or (d) ELA at bandwidths varying from 1 Mbps to 1000 Mbps (1Gbps) and may include CenturyLink ordering circuits utilizing alternate Central Offices or alternate Serving Wire Centers. CenturyLink does not have direct control of the routing, installation, maintenance, performance, etc. of the third party local access facilities ordered on behalf of the Customer.

2.4 Ordering of Diversity Services. Upon acceptance of an Order Form, CenturyLink will notify Customer of its target date for the delivery of each Service ("Customer Commit Due Date"). CenturyLink will use commercially reasonable efforts to install each Service on or before the Customer Commit Due Date, but the inability of CenturyLink to deliver Service by that date will not be a default under the Agreement.

2.5 Service Conditions.

(a) CenturyLink will not provide special construction as part of the Service. Any requests for special construction are handled on an individual case basis.

(b) Customer understands and agrees that CenturyLink has no visibility into the location of fiber strands, conduits, and other network facilities of other carriers and that CenturyLink will not attempt to identify and/or manage other carrier's facilities as part of the Service. Customer understands and agrees that Diversity is offered on On-Net facilities only. Furthermore, Customer understands and agrees that CenturyLink may rearrange (groom) Customer's circuits in accordance with standard CenturyLink network maintenance activities. If a CenturyLink-initiated network rearrangement removes the Customer's diversity, then CenturyLink will notify Customer to determine alternative Diversity solutions, if any.

(c) Customer may experience increased latency on diversely routed circuit(s) as a result of increased actual routing mileage.

(d) Single Diverse Circuit Additional Mileage Charges. If CenturyLink, in its sole discretion, determines that Customer's specified geographic routing criteria on a Single Circuit Diversity request results in excessive additional mileage, CenturyLink may charge Customer actual mileage charges on the Underlying Service.

(e) Customer acknowledges that diverse circuits must have traffic on them in order for CenturyLink to monitor connectivity.

3. Term; Cancellation. The term of this Service Exhibit will begin on the Effective Date of the Agreement (or, if applicable, an amendment to the Agreement if Customer adds this Service Exhibit after the Effective Date of the Agreement) and will continue until the termination of the last Service ordered under this Service Exhibit. Service will automatically terminate on the termination of the Underlying Service. In the event Customer cancels Diversity on an Underlying Service, Customer will pay for the Diversity provided through the effective date of the cancellation and all third party cancellation charges that apply.

**CENTURYLINK® 9-1-1 AGREEMENT
DOMESTIC NETWORK DIVERSITY SERVICES EXHIBIT**

4. Charges. Customer will pay all charges set forth in a valid quote sheet attached to the Order Form for Diversity or in a Pricing Attachment, in addition to the charges for the Underlying Services. If backhaul routing is required to complete Customer's Diversity order for Networking (including Internet Ports and Private Ports,) ATM Service, Frame Relay Service, or Long Distance, Customer will pay the backhaul charges for each diversely routed circuit and for iQ Networking service, the Backhaul Pricing Attachment will be attached to this Service Exhibit. Billing will begin once the circuit is available for testing or use by Customer with the Diversity activated or once Diversity has been added to an existing circuit. List rates will be used to calculate Contributory Charges. The Service is not entitled to the QTA Discount.

* The DS-1s within an Nx bundle must all connect to the same POP

**CENTURYLINK 9-1-1 AGREEMENT
CENTURYLINK SELECT ADVANTAGE SERVICE EXHIBIT**

1. General; Definitions. This Service Exhibit for Products and Services (collectively "Solutions") is attached to and subject in all respects to the CenturyLink Total Advantage or CenturyLink Loyal Advantage agreement between CenturyLink QCC and Customer. Capitalized terms not defined herein are defined in the Agreement. CenturyLink QCC will provide Solutions under the terms of the Agreement, the Service Exhibit, the Purchase Order and/or SOW. This Service Exhibit may not be used for the purchase of voice, data or IP services. In the event of a conflict in any term of any documents that govern the provision of Solutions hereunder, the following order of precedence will apply in descending order of control: any SOW, this Service Exhibit, the Agreement, and any PO. With respect to the Agreement, "Service" is replaced by "Solution" as defined herein, and "Order Form" is replaced with "Purchase Order" as defined herein.

"Change Order" means any change, submitted by Customer to CenturyLink or CenturyLink to Customer, to a SOW that was previously agreed upon by CenturyLink and Customer. Customer will be responsible for all charges related to such SOW Change Order.

"CPE" means either: (a) Customer Purchased Equipment, or (b) Customer Premises Equipment; and consists of hardware, software and materials used in the transport and/or termination/storage of data and voice transmission.

"Products" means CPE and Software offerings from CenturyLink.

"Purchase Order" or "PO" means either (a) a written document issued by Customer for the procurement of Solutions from CenturyLink; or (b) a CenturyLink quote or service order signed by Customer.

"Services" means offerings from CenturyLink that (a) install, maintain or manage CPE; (b) support Customer network management objectives, or (c) are consulting, professional, technical, development, and/or design services.

"Software" means software license offerings.

"SOW" means a statement of work that provides specific details, agreed to by CenturyLink and Customer, relating to the Solution purchased under a PO or the SOW. Agreement on the terms of the SOW will be satisfied by CenturyLink sending the final version of the SOW to Customer; and Customer's signature on the SOW.

2. CenturyLink Select Advantage Solutions.

2.1 Purchase. Customer may purchase Solutions by issuing a PO to CenturyLink, or executing an SOW. If a PO issued by Customer contains any preprinted terms, those terms will not amend, modify or supplement this Service Exhibit in any way whatsoever, notwithstanding any provisions in a PO to the contrary. Any PO or SOW must (a) reference and incorporate this Service Exhibit and its Effective Date, and (b) contain the Customer's exact legal name.

2.2 Limitation of Liability. IN ADDITION TO THE LIMITATION OF LIABILITY UNDER THE AGREEMENT, CENTURYLINK'S TOTAL AGGREGATE LIABILITY ARISING FROM OR RELATED TO SOLUTIONS PURCHASED UNDER THIS SERVICE EXHIBIT, UNLESS OTHERWISE STATED IN THE DETAILED DESCRIPTIONS OR SOW, WILL IN NO EVENT EXCEED: (A) FOR CLAIMS ARISING OUT OF PRODUCTS, THE AMOUNT OF THE PRODUCT SET FORTH IN THE PO RELATING SOLELY TO THE AFFECTED PRODUCT; AND (B) FOR CLAIMS ARISING OUT OF NONRECURRING SERVICES, THE AMOUNT OF THE SERVICE SET FORTH IN THE PO OR SOW.

3. Term; Termination. This Service Exhibit will commence on the Effective Date of the Agreement (or, if applicable, an amendment to the Agreement if this Service Exhibit is added to the Agreement after its Effective Date), and will remain in effect until canceled by either party upon 30 days prior written notice to the other party, or as otherwise stated in the SOW. If Service is terminated for any reason other than Cause, Service may be subject to Termination Charges as set forth in the Detailed Descriptions or SOW. Termination will not affect obligations under Purchase Orders accepted prior to the effective date of termination, and this Service Exhibit will remain in effect as to such obligations in the event it would otherwise have terminated.

4. Charges. Charges for Solutions will be specified in each PO or SOW and are due and payable upon Customer's receipt of the invoice or as otherwise stated in the PO or SOW. Any payment not received within 30 days after the invoice date may be subject to interest charges as permitted by applicable law. Customer will not be eligible for any discounts or promotional offers other than those specifically set forth in an executed PO.

**CENTURYLINK 9-1-1 AGREEMENT
CENTURYLINK NG9-1-1 WITH MANAED 9-1-1 CPE SERVICE LEVEL AGREEMENTS**

1. Service Level Agreements (“SLA” or “SLAs”) Mean Time to Repair

CenturyLink Supplied Network CPE Failure Reported	Severity Level	Replacement Timeline
Monday through Sunday 12:00 am to 11:59pm	Level 1 CenturyLink Network is completely inoperative or severely impacted resulting in no call delivery to PSAP CPE.	Begin trouble isolation and diagnostics upon detection with no more than two hours mean time to repair.
Monday through Sunday 12:00 am to 11:59pm	Level 2 CenturyLink Network is partially inoperative with one link or router still working providing 100% call delivery capability to each PSAP.	Begin trouble isolation and diagnostics within two hours of detection with no more than four hours to repair.

2. CenturyLink 9-1-1 Routing or ALI Delivery

9-1-1 Routing and ALI Delivery Availability Performance Agreement is 99.999%. **This based on the routing and delivery of calls and ALI even when default or contingency routing or bypass procedures are invoked.**

2.1. Severity Level 1

9-1-1 Selective Routing and ALI Delivery	Severity Level	Notification Timeline	Examples
Monday through Sunday 12:00 am to 11:59pm	Level 1 Routing and ALI Delivery is completely inoperative or severely impacted where network or data communication problems on the CenturyLink system prevent CenturyLink from routing 9-1-1 calls or delivery of ALI.	CenturyLink will provide initial notification to affected PSAP and/or regional entity and the State 9-1-1 Program Manager as soon as possible within 30 minutes of the reported outage. Regular status updates will be provided within every two hours until issue is resolved based on FCC Rules.	PSAP not receiving calls, audio is not working if even only intermittent calls, End office traffic is not able to reach PSAP, unable to deliver location and caller information, network hardware or circuit failure at PSAP or core..
Resolution procedure: CenturyLink will correct the service disruption or provide a procedure for customer to bypass or work around such disruption in order to continue operations if possible. If a bypass procedure is utilized, CenturyLink will provide the customer with an action plan for the development of the final resolution, and CenturyLink will continue resolution activity until full service is restored to the customer.			

**CENTURYLINK 9-1-1 AGREEMENT
CENTURYLINK NG9-1-1 WITH MANAED 9-1-1 CPE SERVICE LEVEL AGREEMENTS**

2.2. Severity Level 2

Monday through Sunday 12:00 am to 11:59pm	Level 2 9-1-1 Routing and ALI Delivery Services are severely or critically impaired, where major functions are operative but functioning with limited capacity or critical elements are no longer redundant.	CenturyLink will provide initial notification of the issue by contacting the affected PSAP, regional entity and 9-1-1 program manager as soon as possible within 30 minutes of a 50% or greater loss of trunk capacity or the identification of the service disruption. Regular status updates will be provided as mutually agreed upon between CenturyLink and the customer contact until the issue is resolved.	Examples: reduced incoming trunk capacity.
Resolution procedure: CenturyLink will correct the service disruption or provide a procedure for customer to bypass or work around such disruption in order to continue operations if possible. If a bypass procedure is utilized, CenturyLink will provide the customer with an action plan for the development of the final resolution, and CenturyLink will continue resolution activity until full service is restored to the customer.			

3. A9-1-1 Network Availability

Mean Opinion Score (MOS) (Provided by West)	4.0	The Mean Opinion Score (MOS) goal is 4.0. The network operations center (NOC) will actively monitor the network's quality using the industry standard MOS that automatically activates alarms on the router if the MOS score dips below a specific value. If the MOS score drops to 4.00 or below, a Cisco Embedded Event Manager (EEM) script will failover the call to the alternate IP network instance with no impact to the quality of the call. The EEM will continue to monitor the "failed" path and will require 16 consecutive four-second tests scoring above a MOS of 4.0 in order to begin using the previous MPLS path. With this configuration, the system will consistently achieve greater than 4.0 MOS.
Jitter Threshold	Less than (20) ms	Jitter shall not exceed twenty (20) milliseconds.
Packet Loss	Less than 0.5%	Monthly average packet loss between demarcation points not to exceed 0.5%.
Network Availability	99.999%	Core network components are 99.999% for the Host/Remote core components up to the last serving PSAP Central Office (CO).

**CENTURYLINK 9-1-1 AGREEMENT
CENTURYLINK NG9-1-1 WITH MANAED 9-1-1 CPE SERVICE LEVEL AGREEMENTS**

4. Host/Remote MPLS Network SLA

VIPER Remote MPLS Circuit Availability	99.9%	DS1 and higher bandwidths from the last PSAP serving CO to the VIPER remote sites is 99.9%
VESTA Remote MPLS Circuit Availability	99.9%	DS1 and higher bandwidths from the last PSAP serving CO to the VESTA remote sites is 99.9%

5. Software, Hardware, and Firmware SLAs related to VIPER and VESTA Hosted/Remote Equipment

9-1-1 Software Upgrades– Includes feature enhancements	CENTURYLINK will provide a minimum of (1) software upgrade per year for Airbus and West Host / Remote systems. These upgrades will be applied within (9) months from general availability and after they have been Approved For Use (AFU) by CENTURYLINK.
9-1-1 Software Upgrades and Patches– Software with primarily “bug” fixes	CENTURYLINK will install software upgrades or and patches as required to correct software defects as they are released by the software manufacturer and have been AFU by CENTURYLINK. Installation of all upgrades and patches will be installed within 90 days from AFU date.
9-1-1 Anti-Virus Definitions	CENTURYLINK will install all Anti-Virus software definitions as these are released by each 9-1-1 system manufacturer. Anti-Virus definitions will be installed within 30 days of release.
Operating System (OS) Patches and Service Packs	CENTURYLINK will install all OS security patches and/or service packs after each 9-1-1 manufacturer has tested and approved for deployment and CENTURYLINK has AFU. As OS patches and security updates can require PSAP downtime to apply, if and as required, schedule for installing OS security patches will be submitted within 30 days from AFU Date.
Hardware Refresh	CENTURYLINK will refresh manufacturer supported Hardware components (equipment still supported by manufacturer) to support software as outlined above. CENTURYLINK will replace any end of support hardware on or before 15 days of manufacturer end of support date or upon a mutually agreed date.
Firmware –	CENTURYLINK will schedule or update any firmware as released by the manufacturer and within three (3) months after AFU certification as required to support delivered feature functionality.
Operating System Upgrades -	CENTURYLINK will install new workstation and server OS to support 9-1-1 system software as required. Timing will be dependent on when Software Upgrades are scheduled and will be done at that time.

**CENTURYLINK 9-1-1 AGREEMENT
CENTURYLINK NG9-1-1 WITH MANAED 9-1-1 CPE SERVICE LEVEL AGREEMENTS**

6. i3 Functional Elements (Pass thru from West)

Transitional IPSR Solution = 99.999%		
<p>The A9-1-1 IP Routing Service is architected to provide 99.999% availability to deliver 9-1-1 voice calls to the West A9-1-1 IP Routing demarcation point identified as the egress port for the A9-1-1 router located at each data center defined for this solution. This equates to a cumulative service downtime not to exceed 5.26 minutes per year.</p> <p>A9-1-1 IP Routing Service availability is measured by the cumulative number of minutes of downtime when the A9-1-1 Routing Service is unable to deliver 9-1-1 voice calls to the West A9-1-1 Routing demarcation point. The duration of the A9-1-1 Routing service downtime will be determined by data contained in the A9-1-1 Routing system log files. Isolation of the A9-1-1 IP Routing service from PSAPs that occurs as a result of circumstances beyond West's Span of Control is not considered as West service downtime (e.g. Lack of last mile diversity or redundancy, customer provided network, customer dictated non-diverse &/or redundant connectivity).</p> <p>The A9-1-1 IP Routing Service includes the following components: IPSR, LNG, and BCF.</p>		
ALI Service	99.999%	<p>The A9-1-1 ALI service is architected to provide 99.999% availability to deliver ALI response to the ALI demarcation point in response to an ALI bid. A9-1-1 ALI Service availability is measured by the cumulative number of minutes of downtime when the A9-1-1 ALI Service is unable to deliver ALI response to the ALI demarcation point. Isolation of the A9-1-1 ALI service from PSAPs that occurs as a result of circumstances beyond West's Span of Control is not considered as West service downtime (e.g. Lack of last mile diversity or redundancy, customer provided network, customer dictated non-diverse &/or non-redundant connectivity).</p>
i3 Solution Components = 99.999%		
<p>The A9-1-1 i3 Routing Service is architected to provide 99.999% availability to deliver 9-1-1 voice calls to the West A9-1-1 i3 Routing demarcation point.</p> <p>A9-1-1 i3 Routing Service availability is measured by the cumulative number of minutes of downtime when the A9-1-1 Routing Service is unable to deliver 9-1-1 voice calls to the West A9-1-1 Routing demarcation point. The duration of the A9-1-1 Routing service downtime will be determined by data contained in the A9-1-1 Routing system log files. Isolation of the A9-1-1 i3 Routing service from PSAPs that occurs as a result of circumstances beyond West's Span of Control is not considered as West service downtime (e.g. Lack of last mile diversity or redundancy, customer provided network, customer dictated non-diverse &/or redundant connectivity).</p> <p>The A9-1-1 i3 Routing Service includes the following components: LNG and ESRP and Location Data Management ECRF, LIS, & CIDB Components.</p>		
<p>* Isolation of the A9-1-1 i3 ECRF, LIS, or CIDB service from PSAPs that occurs as a result of circumstances beyond West's Span of Control is not considered as West service downtime (e.g. Lack of last mile diversity or redundancy, customer provided network, customer dictated non-diverse &/or non-redundant connectivity).</p>		
<p>Provisioning Components: West's i3 provisioning components are architected to provide reliability as prescribed by the NENA i3 standard; and, where not specifically stated in the i3 standard, to be in compliance with the current direction of the NENA i3 working group. For example, West's i3 LVF services provisioning interface (LVF with Locology®) is designed to meet/exceed 99.9% availability. This is in concert with the direction from the NENA i3 working group. West</p>		
LVF Service	99.9%	<p>The LVF is designed to meet/exceed 99.9% availability. Availability is determined as defined in NENA 08-506 section 3.4.</p>

**CENTURYLINK 9-1-1 AGREEMENT
CENTURYLINK NG9-1-1 WITH MANAED 9-1-1 CPE SERVICE LEVEL AGREEMENTS**

7. VIPER & VESTA Service Availability

VIPER	99.999%	<p>The A9-1-1 VIPER Service will be 99.999% available to present 9-1-1 voice calls to call answering devices (i.e. Power 911) at the Customer PSAP, as measured by the cumulative number of minutes of downtime when the system is unable to deliver 9-1-1 voice calls to at least one endpoint. This equates to a cumulative system downtime not to exceed 5.26 minutes per year.</p> <p>Measurement Method: Down time starts when 9-1-1 voice calls cannot be delivered to any of Customer's call answering devices. The duration of the VIPER system downtime will be determined by data contained in the VIPER log files and provided in outage reports to the customer.</p>
VESTA	99.999%	<p>The VESTA Distributed GEO Diverse System is architected to provide 99.999% availability to deliver 9-1-1 voice calls to answering devices (i.e. Vesta 911) at the Customer PSAP, as measured by the cumulative number of minutes of downtime when the system is unable to deliver 9-1-1 voice calls to at least one endpoint. . This equates to a cumulative service downtime not to exceed 5.26 minutes per year.</p> <p>Measurement Method: Down time starts when 9-1-1 voice calls cannot be delivered to any of Customer's call handling end points. The duration of the VESTA system downtime will be determined by data contained in the VESTA log files and provided in outage reports to the customer.</p>

8. CENTURYLINK CPE Response

CENTURYLINK CPE <u>Response Times</u> includes the following with our Agreement. CPE Response Time shall be defined as the amount of time expired between the time in which the issue is reported to the CENTURYLINK NOC to the time that a qualified technician is actively trouble shooting the issue either remotely or on-site.		
Response Time Coverage	2 Hours 1.5 Hours for Maricopa and Pima County	Response Time Coverage - Seven (7) days per week, 24 hours per day, 365 Days of the year with a two (2) hour (maximum) response time to have a CENTURYLINK technician on site if related issue cannot be resolved remotely for all 9-1-1 related hardware, software, network repair/maintenance issues or events. This includes all Holidays. Response Times for PSAPS in Maricopa Region and Pima County will be provided in a 90 minute (maximum) on-site response time.
Reporting Trouble	20 seconds	One (1) 800 Number is provided to all PSAP's for both 9-1-1 Network and Equipment repair issues. The CENTURYLINK 9-1-1 NOC has a call-answering objective of answering 80% of all 9-1-1 calls with 20 seconds.
System Spares	NA	CENTURYLINK maintains manufacturer recommended spares at (12) Arizona CENTURYLINK facilities.

**CENTURYLINK 9-1-1 AGREEMENT
CENTURYLINK NG9-1-1 WITH MANAED 9-1-1 CPE SERVICE LEVEL AGREEMENTS**

9. i3 Availability

Timing for delivery of i3 functionality cannot be guaranteed until the scope of the NENA ratified functionality is evaluated and the State of Arizona has determined a desire for that functionality. There are many items in the current i3 definition that Authorities have not yet requested and may not see fruition, some even potentially being eliminated in latter versions of i3. Our commitment is that “within 3 months of each NENA i3 version release, CENTURYLINK will provide a schedule for the incorporation of all applicable updates to each of its solution components. Updates to feature functionality for included core components will be provided no later than 18 months from each i3 version release and Customer determining a desire for the applicable functionality. Furthermore, CENTURYLINK will work with the State of Arizona to identify i3 functionality that the State desires to implement in a timely manner and provide date commitments for those items. With the intensive involvement of Airbus and West Standards Development Organization staff in the NENA development group, this good faith dialog with the State for desired functions would be on an informed basis.

10. End Of Support Routing Components – Commitment to Replace EOS Equipment

Testing is currently being done to determine suitable devices for moving forward. As with any devices in the critical call delivery path, the target system availability is 99.999%. Specific device replacement make/model will be pending ongoing tests and if made a service offering, the specific devices will meet these Service Level Agreements. CENTURYLINK and West will replace any EOS equipment on or before 15 days of manufacturer end of support date or upon a mutually agreed date. This will be done at no cost to customer.

11. CENTURYLINK Legacy 9-1-1 Trunk Diversity and Service Reliability – Commitment for Diversity Design

CenturyLink and West have worked together to create an environment where the traffic is more evenly distributed between the West ECMC's located in Englewood and Miami. CenturyLink and West are also working to distribute End Office (EO) traffic equally between West's Trunking Gateways (TGW) where feasible. For load balancing purposes, CenturyLink and West will separate the end office routing to the TWGs. The end offices in the Tucson LATA will use the Tucson TWG as the primary route with overflow trunks to the Phoenix TWG. Likewise, the end offices in the Phoenix LATA will route to the Phoenix TWG as the primary with overflow trunks to the Tucson TWG. Additionally, the TWGs will continue to load balance by alternately sending calls to each of the ECMCs.

12. Excused Downtime for all SLAs

This Service Level Agreement will not apply, and no time or lack of Service availability will be calculated for any event that adversely impacts the Service that is caused by: (a) the acts or omissions of Customer, its employees, contractors or agents or its end users; (b) the failure or malfunction of equipment, applications or systems not owned or controlled by CenturyLink or its vendors or agents under its control; (c) Force Majeure Events, as defined in the Agreement; (d) scheduled service maintenance, alteration or implementation; (e) the unavailability of required Customer personnel, including as a result of failure to provide CenturyLink with accurate, current contact information; (f) CenturyLink's lack of access to the Customer premises where reasonably required to restore the Service; (g) Customer's failure to release the Service for testing or repair and continuing to use the Service on an impaired basis; (h) improper or inaccurate network specifications provided by Customer.

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ATTACHMENTS, EXHIBITS, SERVICE GUIDES, OR SOWS INCORPORATED INTO THE SERVICE EXHIBITS**

- **CENTURYLINK AIRBUS HOSTED VESTA STATEMENT OF WORK**
- **CENTURYLINK NG9-1-1 WITH MANAGED 9-1-1 CPE STATEMENT OF WORK FOR INFRASTRUCTURE IMPLEMENTATION**

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CENTURYLINK AIRBUS HOSTED VESTA STATEMENT OF WORK

This Statement of Work (“SOW”) is subject to the agreement between CenturyLink Communications, LLC f/k/a Qwest Communications Company, LLC (“CenturyLink”) and <CUSTOMER> (“Customer”) under which Customer has agreed to the terms and conditions for purchase of installation, implementation and ongoing maintenance of NG911 equipment (“CPE”) which was signed by Customer on <ENTER DATE the Agreement was signed> (the “Agreement”). Qwest Communications Company, LLC d/b/a CenturyLink QCC completed a name change to CenturyLink Communications, LLC on April 1, 2014. References in supporting agreements or other documents, to Qwest Communications Company, LLC or its predecessors are replaced with “CenturyLink Communications, LLC.” Capitalized terms not defined herein are defined in the Agreement. **This SOW will not become effective unless and until CenturyLink and Customer have executed the Agreement referenced in this section.**

Under this SOW CenturyLink will provide a professional services solution for implementation of NG911 Hosted CPE (“Project”). The Project might include a recommendation to purchase other CenturyLink products or services. CenturyLink will be the prime contractor for all services and products associated with this Project. For the support required under this SOW, CenturyLink will be working with Airbus (“Subcontractor”). Accordingly, references to “CenturyLink” in this SOW may or may not include Subcontractor as the context may require; provided, however, that Subcontractor is not a party to the Agreement or this SOW and as such any formal dispute or claim regarding this Project will be between Customer and CenturyLink. CenturyLink will be fully responsible for the performance of all work to be performed hereunder, which is dependent upon the accuracy of information provided by Customer, in accordance with the Agreement and this SOW.

CenturyLink does not require or intend to access Customer data in its performance hereunder, including but not limited to any confidential health related information, that constitutes Protected Health Information (“PHI”), as defined in 45 C.F. R. §160.103 under the Health Insurance Portability and Accountability Act of 1996 (“HIPAA Rules”). To the extent that any exposure to PHI is incidental to CenturyLink’s provision of the Service or Work Product provided under this SOW, and not meant for the purpose of accessing, managing the PHI or creating or manipulating the PHI such exposure is allowable under 45 CFR 164.502(a)(1)(iii). However, to the extent that CenturyLink is required to access PHI in the course of providing Services to Customer and acts in the capacity of a Business Associate, the parties’ obligations will be governed by the Business Associate Addendum of the underlying Agreement.

1. Introduction

This SOW sets forth the responsibilities of CenturyLink, Airbus and the PSAP Customer (CUSTOMER) for Airbus Managed Hosted Vesta Services implementation services and ongoing professional services described herein (“Services”).

2. Services Overview

CenturyLink, through Airbus, will provide Managed Hosted VESTA Services to the CUSTOMER for the solution which combines Airbus’s Managed Hosted VESTA Services (also referred to as “Managed Hosted VESTA”) with Airbus routers and network monitoring services; in conjunction with CenturyLink’s transport services to provide an end-to-end 9-1-1 emergency call handling solution (“Managed Hosted VESTA Solution”) for CUSTOMER.

2.1. Managed Hosted VESTA Hosted Call Handling

2.1.1 Managed Hosted VESTA Services

Managed Hosted VESTA Service is purchased as part of a bundle from CenturyLink, along with West[®] A9-1-1 Routing Service and Location Data Management Service for CUSTOMER.

The Managed Hosted VESTA Services provide hosted call handling functionality over a system that includes VESTA, servers and workstations installed at each CUSTOMER PSAP. Airbus will provide and

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maintain redundant, regionally diverse systems for Managed Hosted VESTA Call Handling, including hosted VESTA. Hosted equipment will be located in CenturyLink's data centers. As part of Managed Hosted VESTA Services, Airbus provides, installs, configures core functions of, and monitors all required host end system components. Airbus also provides and configures core functions of all Airbus required PSAP based equipment ("CPE") including servers, position equipment and networking equipment (routers and switches). CenturyLink installs, maintains and provides on-site Airbus certified technicians for all CPE including servers, position equipment and networking equipment (routers and switches). CenturyLink and Airbus will work with each CUSTOMER to determine and implement initial VESTA configurations. CenturyLink will work with the end-users on any future desired configuration changes and will coordinate all such changes with Airbus as required. CenturyLink, though Airbus, will provide the CUSTOMER with the following services:

- ✓ Managed Hosted VESTA Services
- ✓ Installation of host end equipment
- ✓ Training

CenturyLink will provide the CUSTOMER with the following services as it pertains to Managed Hosted VESTA:

- ✓ During installation activities, CenturyLink will have primary responsibility for the following:
 - Project Management
 - Receipt and inventory of equipment at PSAPs
 - Installation of CPE including servers, position equipment and networking equipment.
 - Cabling
 - All telco facing coordination and installation activities (from the demark back)
- ✓ Project Surveys. These are to be completed by an Airbus Certified CenturyLink technician and the completed survey must be provided to the Airbus Project Manager within five business days of completion.
- ✓ Tier 1 Support

Work performed by the CUSTOMER outside of the above parameters will result in a voiding of warranty, cancellation of maintenance services, additional service fees, recertification, reinstatement or any of the above. Airbus authorizes CenturyLink Airbus Certified technicians to perform move, add and change orders without assistance from, but with coordination with, Airbus unless the activity includes the installation of a software upgrade. Upgrades will require coordination with Airbus and assistance as required to make necessary host end changes. Included in the permitted activities are installation of knowledge bases and feature releases not part of a software upgrade and installation of additional positions.

If CenturyLink is required to dispatch on-site to repair an issue caused by CUSTOMER, CenturyLink may invoice CUSTOMER for its related time and travel expenses.

2.1.2 Responsibility Matrix

The following matrix outlines the responsibilities of each party for the Managed Hosted VESTA Services. Where both parties have been listed, the first-named party is lead, and this SOW more specifically defines the responsibilities of each party.

Task	Responsibility
<i>Project Implementation</i>	
Project Management	CenturyLink with Airbus support
Project Plan for A9-1-1 Solution	West/CenturyLink
Managed Hosted VESTA System Architecture	Airbus

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Managed Hosted VESTA Services Network Architecture	Airbus
Network Architecture contained within the Managed Hosted VESTA Solution	Airbus
Redundant MPLS Connectivity between the ECMCs, CenturyLink data center, and each CUSTOMER Facility– Establish and test connectivity	CenturyLink
CUSTOMER Facilities	CenturyLink/CUSTOMER
CUSTOMER Facility Site Preparation (floor space, power, etc.)	CUSTOMER/CenturyLink
CUSTOMER Facility Project Survey for Airbus Managed Hosted VESTA Services PSAP Equipment	CenturyLink/Airbus
Project Survey Analysis and Report	Airbus
Project Survey Guideline and Documentation	Airbus/CenturyLink
Site Readiness as addressed in Project Survey Analysis and Report	CenturyLink/CUSTOMER
PSAP Data Collection, Configurations/Lists – Star Codes, Transfer, Contact List, etc.	CenturyLink/Airbus/CUSTOMER
Airbus Managed Hosted VESTA Services PSAP Equipment – Install and Maintain and CUSTOMER Facility	CenturyLink
Airbus Managed Hosted VESTA Services PSAP Equipment – Provide and Stage	Airbus
Managed Hosted VESTA Services Training	Airbus
Pre-production and End to End Testing	Airbus/CenturyLink/CUSTOMER
Develop Migration plan and execute Migration Testing	Airbus/ CenturyLink/CUSTOMER
Managed Hosted VESTA Services Production Turn-up	Airbus/ CenturyLink/CUSTOMER
MIS Reporting	CUSTOMER
Managed Hosted VESTA Services– Monitoring	Airbus/CenturyLink
Managed Hosted VESTA Services - Tier 1 Maintenance	CenturyLink
Network Monitoring and Maintenance	Airbus/CenturyLink
Managed Hosted VESTA Services Upgrades	Airbus/CenturyLink
Managed Hosted VESTA Services Log storage and backups	Airbus/CenturyLink
Problem Reporting	CenturyLink/CUSTOMER/Airbus
Problem Triage and Resolution	CenturyLink/Airbus/CUSTOMER
Airbus Managed Hosted VESTA Services Network Capacity Management	Airbus
MPLS Network Capacity Management	Airbus
Managed Hosted VESTA Solution Network Capacity Management	Airbus

Table 1: Responsibility Matrix

2.1.3 Scalable, IP-Based Solution

Managed Hosted VESTA Service leverages Session Initiation Protocol (“SIP”) technology.

Managed Hosted VESTA Services provides CUSTOMER PSAPs with:

- ✓ No upper limit in regard to number of End-users

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- ✓ A networked model that integrates data and voice traffic
- ✓ Implementation of call queues to meet call taker distribution needs

2.1.4 Configurable Call Distribution and Integrated Automatic Call Distribution (“ACD”) Features

Managed Hosted VESTA Services provide a configurable layering of options and features for call distribution within each CUSTOMER and between other PSAPs (Other PSAPs must be on the Managed Hosted VESTA Services Platform) as necessary for backup scenarios.

Managed Hosted Services support **Shared Call Appearance (SCA)**, where call takers can answer a call on a Shared Call Appearance.

Managed Hosted VESTA Services support Multiple ACD algorithms (If Activated):

- ✓ **Ring All:** Directs the call to all available call takers in the group
- ✓ **Circular:** the call to the next available call taker in round robin fashion within the group.
- ✓ **Linear:** Directs the call to the first available call taker within the group with the highest priority setting.
- ✓ **Longest Idle:** Presents the call to the longest idle call taker in the group.

Managed Hosted_VESTA ACD provides multiple features:

- ✓ **ACD Queue:** Allows lines and trunks to be assigned to specific queues. Each agent of the Customer can be a member of one or more ACD queues. Customer’s agent will receive a call from a queue when they are logged on and ready.
- ✓ **Customer Agent Priority:** Allows a priority to be assigned to each Customer agent in a queue.
- ✓ **Queue Recorded Announcement:** A PSAP-recorded announcement can be played at intervals to callers waiting in a queue.
- ✓ **Not Ready:** Allows Customer’s agents to complete tasks from a previous 9-1-1 call before a new call is presented.
- ✓ **Auto Answer:** The console automatically answers an ACD-routed call. The Auto Answer feature contains a headset detection for console ACD ready state option. When this option is enabled, the console immediately enters a Not Ready state for ACD calls when the call taker unplugs the headset from the jackbox. After the call taker plugs the headset into the jackbox, the Ready button must be clicked to enable the call taker to receive ACD calls again.

2.1.5 VESTA Workstations

Managed Hosted VESTA Services include workstations that provide agents with on-screen call control of emergency and administrative calls. All workstations will be considered Managed Hosted VESTA Services PSAP Equipment.

VESTA also provides the following user features:

- ✓ **Warm or blind one button transfers.**
- ✓ **Distinctive ring tones** on a per line basis, for audible line ringing identification.
- ✓ Multiple **conferencing features**, including adding and dropping participants and quick visualization of the conference through the conferencing window.
- ✓ Manual and **automatic ALI re-bid** and incorrect location reporting.

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- ✓ Personal, shared and **multiple line appearances** that use color, icons and call status elements to offer fast identification and quick call status information to users.
- ✓ Configured to automatically forward admin line traffic according to business rules.
- ✓ **Greetings manager** which allows call takers to create and manage automated messages. VESTA 9-1-1 also offers a system wide automated messaging for specific queues.
- ✓ A high capacity of entry contacts and **speed dial** system for one click speed dial, contacts may be search at the simple or advanced level for the fastest lookup. Additionally through intelligent speed dialing and selective transfer agencies, speed dials are automatically displayed and dialed based on ESN.
- ✓ **A Configurable ALI display**
- ✓ **Instant Recall Recorder (IRR) & IRR Retrieval:** Instant Recall Recorder (IRR) is a telephony, radio, and microphone-based message recording and recorded message handling device. Customer's agents can play back recently completed calls.
- ✓ **Integrated TTY** via Baudot with pre-programmable messages and HCO/VCO capabilities.

The VESTA User Interface offers custom layouts. These layouts can be designed to meet the requirements of each PSAP, as well as each user role. When Users log into to a selected role, the layout optimized for that role is automatically loaded/displayed. PSAP Administrators create highly functional layouts for each role using a large library of icons, custom colors, fonts, window layouts etc.

CenturyLink or Airbus will provide and install intelligent workstations at each CUSTOMER facility.

- ✓ Two LCD monitors per position – brands as determined by CenturyLink and Airbus. Additional monitors, per application, will be supported at the request of the CUSTOMER. Touch screen monitors are not currently supported.
- ✓ Each position will be adjusted to the electrical characteristics of a given handset or headset model. As such, in PSAPs where multiple models are used, the CUSTOMER will be responsible for ensuring the handset or headsets are only used at the positions specifically adjusted for those models.
- ✓ A Handset
 - The CUSTOMER may elect to provide headsets for selected positions. Any headset used on the system must be approved by Airbus for compatibility. A current list of approved headsets is available upon request.

CenturyLink or Airbus will provide, install and maintain one current model color laser printer at each CUSTOMER facility. The CUSTOMER will be responsible for ink, toner and paper.

2.1.6 Managed Hosted VESTA Service Responsibilities

2.1.6.1 Point of Contact

Airbus Responsibility:

Airbus will provide a Program Manager for CenturyLink and CUSTOMER who will act as the Single Point of Contact ("SPOC") with West for the A9-1-1 Routing, A9-1-1 Location Data Management service, and for the Managed Hosted VESTA planning and deployment phases. Individual project managers may also be assigned by Airbus for each of the functions above as a support for the SPOC.

CenturyLink Responsibility:

CenturyLink will designate a project manager as the single point-of-contact for the CUSTOMER for all planning and deployment phase activities for the services.

2.1.6.2 Project Management and Detailed Project Plan

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Airbus Responsibility:

Airbus will provide project management for all Airbus Managed Hosted VESTA responsibilities under this SOW. Airbus will co-ordinate with CenturyLink in developing an integrated Managed Hosted VESTA Solution project plan for transition activities. The Managed Hosted VESTA Solution project plan will include milestones for each project phase and will be updated over the course of the project as mutually agreed upon by all parties. Airbus will support CenturyLink in their CUSTOMER project management efforts.

Airbus will provide support personnel to complete Airbus responsibilities in a timely manner as set forth in the project plan. Airbus will be responsible for all travel expenses for Airbus personnel.

CenturyLink/CUSTOMER Responsibility:

CenturyLink will provide project management for the CUSTOMER for all Managed Hosted VESTA responsibilities of CenturyLink under this SOW.

The CUSTOMER will provide support personnel to complete all responsibilities of the CUSTOMER under this SOW in accordance with the mutually agreed upon final project plan.

2.1.7 Managed Hosted VESTA Configurable Attributes

Airbus Responsibility:

Airbus will work with the CUSTOMER to create a data collection form to support the information required to configure Managed Hosted VESTA for the CUSTOMER PSAP.

CenturyLink/CUSTOMER Responsibility:

CenturyLink and the CUSTOMER will provide Airbus with a complete list of configurations for the CUSTOMER PSAP in accordance with the detailed project plan.

2.1.8 Workstations

Airbus Responsibility:

Airbus will install and monitor each Workstation. The Airbus Network Operations Center (NOC) captures alarms on all Airbus provided equipment including the CUSTOMER equipment including the workstations.

CUSTOMER Responsibility:

The CUSTOMER will provide the following space for each workstation:

- ✓ 7" x 17" x 15" either on or under the desktop
- ✓ 18" x 10" x 21" on the desktop for each monitor

The CUSTOMER will provide power, ground, and environmental controls for the workstations to be installed at each CUSTOMER Facility as follows:

- ✓ HVAC - Each Call taker and Supervisor workstation position with two 22" Monitors will dissipate a maximum of 1950 BTUs per/hour.
- ✓ A minimum of two 15-ampere circuits (20A recommended) to provide diverse power for the workstations. Each circuit must be wired to an individual circuit breaker. Each circuit must provide two fourplex outlets with individual hot, neutral and ground wires at a position location. One 15-ampere circuit can support up to three workstations, if there are more than 6 positions, additional dedicated circuits must be installed, one additional for each three workstations. Workstations should be distributed evenly across the circuits. Circuits for workstations should be connected to UPS.
- ✓ Additional circuits may be required for other non-emergency equipment.
- ✓ Each position should be prepared with two (4 x 120 VAC) outlets as follow:
 - Two power receptacles for monitors
 - One Power connector for the PC (NEMA 5 15P)

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- One additional power receptacle for miscellaneous

2.1.9 CUSTOMER PSAP Training

Airbus Responsibility:

2.1.9.1 Admin Training

Airbus is providing (1) Train the Trainer (TTT) Sentinel Admin class, (1) Activity View Admin class, (1) Vela Admin class, (1) DataSync Admin class, per PSAP. Airbus is utilizing a Train the Trainer approach for all end user Agent training.

2.1.9.2 Train the Trainer Training – Agents

Airbus will provide one (1) TTT Agent class per year. These classes will be hosted in Arizona at a customer or CenturyLink facility to be determined. Attendees can be either CenturyLink associates or CUSTOMER PSAP designates. Train the Trainer classes will cover all Agent topics as well as tips to train the call takers specific to the PSAP.

2.1.9.3 Cutover coaching

Supplied whereby a Airbus trainer will be on site on the floor of the PSAP on the day of the cutover to answer any questions and or assist the call takers as they transition to the new system.

2.1.9.4 Quarterly Webinars

Airbus's training department will develop a value added free quarterly webinar based service to review what's new, answer questions, etc. Topics are TBD, but might include:

- ✓ Major System Changes
- ✓ New Features
- ✓ Important need to know information

2.1.10 Production Turn-up

Airbus Responsibility:

Airbus will work with CenturyLink and the CUSTOMER to mutually agree on a Testing and Production Migration Plan. The Testing and Production Migration plan will cover pre-production end to end testing and production testing with CenturyLink and the CUSTOMER, and deployment. During pre-production testing, technical support will be provided during Airbus Normal Business Hours. System testing and the production migration for each CUSTOMER PSAP will be implemented according to the detailed project plan.

CenturyLink/CUSTOMER Responsibility:

CenturyLink and the CUSTOMER will work with Airbus to execute testing of the Managed Hosted VESTA Call handling system in accordance with the detailed project plan. CenturyLink will provide onsite support during the Production Turn-up at the CUSTOMER Facility.

2.1.11 Monitoring, Maintenance, and Support

CenturyLink /CUSTOMER Responsibility:

CenturyLink will perform maintenance and software/equipment upgrades at the PSAP location for Managed Hosted VESTA Services.

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CenturyLink will provide On-site Support Services by Airbus certified technicians to assist with issues that require System expertise in troubleshooting and restoration at the End-User's location.

On-Site Support Service includes:

Dispatch a technician to End-User's site when the issue cannot be resolved remotely.

- ✓ When on-site, assist End-User in performing System diagnostics.

For On-Site Support Services the CUSTOMER will:

- ✓ Brief on-site CenturyLink technician on issue(s) and actions taken.
- ✓ Allow CenturyLink both on-site and remote access to the System. Remote access is made utilizing a secure VPN to each site.
- ✓ Validate issue resolution prior to close of the case.
- ✓ Cooperate with CenturyLink and perform all acts that are reasonable or necessary to enable CenturyLink to provide the On-Site Support Services. These include maintaining a suitable environment (heat, light, and power) and providing the technician with full, free, and safe access to the System. All sites must be accessible by standard service vehicles.

Airbus Responsibility:

Airbus will provide application level monitoring for Airbus provided network elements. Airbus will monitor the Managed Hosted VESTA systems including network elements, backroom equipment and workstations.

Airbus will provide Remote Technical Support to CenturyLink's Network Reliability Operations Center (NROC) for the Airbus System. Help desk support is available 24/7 through both a toll free hotline and a secure End-User Internet portal. All service inquiries are tracked.

Requests made for Airbus personnel onsite will be made available to CUSTOMER at an additional cost.

2.1.12 Software Release Updates

Airbus Responsibility:

Application software and firmware program updates are defined as minor enhancements to the already purchased product feature / functionality set. A product change is classified as minor, in the discretion of Airbus, based upon the impact of the change to the core functionality of the product. Customers will be notified by an Airbus Product Change Notice, of all application software and firmware program updates, which occur within the term of the Service. The Customer shall then contact CenturyLink, who in turn will contact Airbus to order the update at no additional charge provided that the Service is in effect. Application software and firmware program updates will roll into the existing Service, thereby not extending the term of the Service. Any change in the two numbers following the decimal point within the product version number constitutes an application software program update (for example a change from product version 1.10 to 1.20, or 2.11 to 2.12, or 3.20 to 3.30 et. al. will represent an application software program update). A change from PSC15 version A to PSC15 version B will represent a firmware program update.

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CENTURYLINK NG9-1-1 WITH MANAGED 9-1-1 CPE STATEMENT OF WORK FOR INFRASTRUCTURE
IMPLEMENTATION

1.0 Overview

This Statement of Work describes the hardware, software, and services that CenturyLink will deploy and build out as the necessary CenturyLink infrastructure to support the State of Arizona PSAP's Managed NG9-1-1 and Customer Premise Equipment (CPE) solution (call answering equipment). The network resulting from this SOW will be used exclusively for the benefit of 9-1-1 Centers in the State of Arizona, and may benefit 9-1-1 Centers in other counties or parts of the State that Customer is not located. CenturyLink will solely and exclusively own and license any of the hardware, software, and services that are implemented under this SOW, and the infrastructure will be used to provide services on a subscription or license basis for a defined term to Customer as described in an Agreement between CenturyLink and Customer.

2.0 Network Components

CENTURYLINK will install and/or provision the following network components to support the core functions of the NG9-1-1 and CPE infrastructure. CENTURYLINK will provide all hardware, software, and services to build out all network components. This includes:

- Emergency Services (ES) trunks from the four (4) Arizona CENTURYLINK legacy selective routers to one of two (2) Legacy Network Gateways (LNG)
- At each LNG, two (2) diverse 1Gig CenturyLink IQ™ Private Port circuits to the CENTURYLINK MPLS cloud for LNG to ECMC (Emergency Communications Management Center) connectivity
- A 1Gig point-to-point circuit between the two Arizona LNGs
- At each ECMC, two (2) diverse 1Gig **CenturyLink IQ™** Private Port circuits to the CENTURYLINK MPLS cloud for LNG to ECMC connectivity
- At each ECMC, two (2) diverse 1Gig circuits to VIPER host systems for NG9-1-1 IP SIP call delivery from the IP Selective Router (IPSR) or i3 functional components to VIPER host
- Provisioning, through the West WAN, of VIPER node to node connectivity between the ECMC
- At each ECMC, two (2) diverse 1Gig **CenturyLink IQ™** Private Port circuits to the CENTURYLINK MPLS cloud for NG9-1-1 IP SIP call delivery from the IPSR or i3 functional components to VESTA host
- Two (2) 1Gig point-to-point layer 2 circuits for connectivity between each VESTA core
- At each ECMC, two (2) diverse 1Gig **CenturyLink IQ™** Private Port circuits to the CENTURYLINK MPLS cloud for VIPER Host to Remote connectivity
- At each VESTA host site, two (2) diverse 1Gig **CenturyLink IQ™** Private Port circuits to the CENTURYLINK MPLS cloud for VESTA host to remote connectivity
- At each VESTA host site, one (1) **CenturyLink IQ™** Internet Port circuit to the CENTURYLINK MPLS cloud for VESTA to Airbus NOC connectivity and CENTURYLINK VPN access
- At the Airbus NOC, two (2) **CenturyLink IQ™** Internet Port circuit to the CENTURYLINK MPLS cloud for VESTA to Airbus NOC connectivity
- Two (2) diverse **CenturyLink IQ™** Private Port circuits from the CENTURYLINK MPLS cloud to Phase I PSAPs for VIPER or VESTA host to remote connectivity
- CENTURYLINK will provide all routers, network switches, firewalls, and gateways required for network connectivity

3.0 Legacy Network Gateway (LNG)

CENTURYLINK will provide, install and/or provision the following NG9-1-1 components at each Legacy Network Gateway (LNG):

- Required space in two (2) LNG Data Centers for equipment hardware
- Rack space, racks, and protected AC power in data centers
- Gateways installed at each LNG to convert analog CAMA trunks to IP SIP trunks
- Routers and firewalls
- Terminal Servers
- Network Monitoring and Managed Services hardware and applications
- All Network components from Section 1.0

4.0 Emergency Communication Management Center (ECMC)

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IMPLEMENTATION

CENTURYLINK will provide, install and/or provision the following NG9-1-1 and CPE components at each Emergency Communications Management Center (ECMC)

- Required space in two (2) ECMC Data Centers for equipment hardware
- Rack space, racks, and protected AC power for all ECMC equipment including Internet Protocol Selective Router (IPSR).
- Event Logging Services
- Clear View Reporting Services
- Network Monitoring and Managed Services hardware and applications
- All Network components for Section 1.0

5.0 VIPER Host Sites

CENTURYLINK will provide, install and/or provision the following VIPER CPE components at each Emergency Communications Management Center (ECMC)

- Required space in two (2) ECMC Data Centers for equipment hardware
- Rack space, racks, and protected AC power for all VIPER equipment
- All VIPER Geo Diverse Multi-Node host servers, software, applications, and gateways
- Network Monitoring and Managed Services hardware and applications
- All Network components for Section 1.0
- All costs for required security equipment
- NMS Monitoring Probes – Used to conduct service level measurements for end-to-end VoIP (SIP) call testing

6.0 VESTA Host Sites

CENTURYLINK will provide, install and/or provision the following VESTA CPE components at each VESTA Host Location

- Required space in two (2) VESTA Host Data Centers for equipment hardware
- Rack space, racks, and protected AC power for all VESTA equipment
- All VESTA Distributed Geo Diverse host servers, software, applications, and gateways
- Network Monitoring and Managed Services hardware and applications
- All Network components for Section 1.0
- All costs for required security equipment
- NMS Monitoring Probes – Used to conduct service level measurements for end-to-end VoIP (SIP) call testing

7.0 Phase I PSAP Remote Sites

CENTURYLINK will provide, install, and/or provision the following CPE components at each remote PSAP site:

- Required racks for network components
- Extend D-Marks to customer's equipment room
- Provide and install network routers, firewalls, and switches as required
- Network Monitoring and Managed Services hardware and applications
- All Network components for Section 1.0

8.0 Network Operations Centers (NOC)

Included in this SOW is all cost for CENTURYLINK, West, and Airbus-DS to build out the required NOC infrastructures. This may include placement of hardware, reconfiguration of existing hardware and/or software, remote monitoring services for network and CPE components, and reporting engines to meet requirements as described in the CENTURYLINK Service Exhibit.

9.0 Testing

CENTURYLINK will test all infrastructure core components before turning up PSAPs. This will include:

- Test all IP network elements to validate meets or exceeds network metrics
- Test all ES trunks for proper routing and voice quality
- Test and validate system monitoring for core infrastructure is working

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 IMPLEMENTATION**

- Test VPN remote access is working
- Example of pre-testing to be performed:
- Test Setup
 - Two (2) test trunk groups will be created, one for routing to VIPER system and other for routing to VESTA position
 - Test positions will be installed for each NG9-1-1 system
 - Test 9-1-1 calls will be placed to measure the following
 - Call routed to the proper 9-1-1 system, VIPER or VESTA
 - ANI and ALI were sent and received
 - Voice quality and MOS scores will be tested and measured
 - Transfer to legacy PSAP was successful including ANI and ALI
 - Transfer from legacy PSAP was successful including ANI and ALI

Note: Testing above is for critical NG9-1-1 call delivery to the host system. Further in depth Host to Remote PSAP testing will be conducted for each PSAP as it is being installed and prepped for system turn-up.

10.0 Deliverables

- Detailed Network Design for:
 - LNG
 - ECMC
 - VIPER Geo Diverse Multi Node Host
 - VESTA Geo Diverse Host
- Testing Results – Written report detailing the successful pre-testing from section 9 of the NG9-1-1 infrastructure before making the system active.

11.0 Schedule and Milestones

The below list consists of the milestones identified for the implementation of this Statement of Work:

Milestone	Description	Start Date	Stop Date
1	Agreements Completed - Infrastructure SOW and Infrastructure Agreement signed and completed	TBD	TBD
2	Definition Phase	TBD	TBD
3	Architecture Phase	TBD	TBD
4	Integration Phase	TBD	TBD
5	PSAP and Host Orders and Installation	TBD	TBD
6	Deployment Phase	TBD	TBD
7	Maintenance Phase	TBD	TBD

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Definition of Terms

Term	Definitions
ALI	Automatic Location Identification
BGP	Border Gateway Protocol
CAD	Computer Aided Dispatch
CAMA	Centralized Automatic Message Accounting
CDR	Call Detail Record
CE	(Customer Edge) MPLS Router at customer site. CENTURYLINK will provide this equipment with the Managed 9-1-1 Solution
CPE	Customer Provided Equipment
CUG	Closed User Group
DDOS	Distributed Denial of Service Attack
Diversity	Two paths with no single point of failure with two complete entrance facilities
DOS	Disk Operating System
ECMC	Emergency Call Management Center. Location of IP Selective Router, i3 functional elements, and VIPER Hosts
ECRF	Emergency Call Routing Function
ELT	English Language Translations
EM Trunk	Emergency Management Trunk
EO	End Office
ES Trunk	Emergency Services Trunk
ESInet	The network the i3 architecture runs on
ESN	Emergency Services Number
ESQK	Emergency Service Query Key
ESRD	Emergency Services Routing Digit
ESRK	Emergency Service Routing Key
ESSID	Electronic Switching System Identification
FW	Frequency Modulation
Gateway	Gateways are used to convert legacy TDM (Time Division Multiplexing) voice calls to IP
GIS	Geographic Information Systems
GPS	Global Positioning System
GUI	Graphical User Interface
HSRP	Hot Standby Router Protocol
ILEC	Independent Local Exchange Carrier
IP	Internet Protocol
IPP	IP Precedence
IPSR	IP Selective Router
IQ MPLS	IQ MPLS Private Port - CENTURYLINK Product name for a private MPLS network.
KVM	Keyboard, Video, and Mouse
LATA	Local Access and Transport Area
LNG	Legacy Network Gateway - Interfaces between the legacy network and the ESInet
LSR	Legacy Selective Router
LSRG	Legacy Selective Router Gateway
LVF	Location Validation Function
MOA	Memorandum of Agreement
NGAP	Next Gen Aggregation Point
NPD	Numbering Plan Digit (1 digit number assigned to represent an area code. Example: 2 = 602, 3 = 520)
OAM	Operations, Administration and Management
PE	(Provider Edge) CENTURYLINK network equipment used to provision its IP Network
PGM	PSAP Gateway Manager
POP	Point of Presence - an artificial demarcation point where servers, routers, and other devices are located

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PSAP	Public Safety Answering Point
QoS	Quality of Service
RCL	Regional Co Location - Now referred to as LNG
RFAI	Request for Assistance Interface
RTT	Real Trip Time
SBC	Session Border Control (Session Initiated Protocol) – The protocol used for initiating, managing, and terminating VoIP traffic over an IP network
SIP	
SLA	Service Level Agreement
SR	Selective Routing
SRDB	Selective Routing Database
SS7	Signaling System 7
TDM	Time Division Multiplexing
TG	Trunk Group
TN	Telephone Number
TSP	Telecommunication Service Provider - TSP means a provider of wireline, wireless, VoIP, MLTS (shared tenant or PBX providers) or any other service provider permitting its End Users of such technology to access a PSAP by dialing the digits 9-1-1 and having the applicable 9-1-1 Governing Authority's approval to access said PSAP(s). TSP for the purpose of this Agreement includes, but is not limited to, all ILECs, CLECs, CMRS, VoIP or other service providing entities requiring access to West Comm's Intelligent Emergency Network®.
TSS Database	Transaction Services System – A data management system developed by West that processes and maintains data for ALI retrieval and selective routing for enhanced 9-1-1 systems.
VoIP	Voice over IP
VPN	Virtual Private Network - a logical private network running over 1 physical connection.
VRRP	Virtual Router Redundancy Protocol

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1.0 NEXT GEN 9-1-1 ROUTING SERVICES OVERVIEW

CENTURYLINK's Next Gen 9-1-1 Routing is a specialized managed network for processing 9-1-1 calls from both traditional voice and non-traditional voice and data networks. Next Gen 9-1-1 Routing provides traditional selective routing functionality and IP-enabled interface alternatives. Next Gen 9-1-1 Routing is a service for the routing and delivery of 9-1-1 calls from end office, central office, control office, mobile switching center, and IP-enabled interface alternatives (hereafter collectively referred to as "End Office") to STATE designated PSAPs over a CENTURYLINK IQ MPLS Private Port, rather than routing such calls through the ILEC's selective router. Next Gen 9-1-1 Routing includes the delivery of ANI and supports 8 (NPD+7) or 10 digits. Next Gen 9-1-1 Routing service requires the input of selective routing database (SRDB) updates from the database management system. Other SRDB data sources are anticipated in the future. As such, all TNs/ESRks/ESRDs/ESQks as well as all such pseudo ANI schemas which may be propagated via the NENA recommended standards or any national standards body, routed with the Next Gen 9-1-1 Routing solution must be available to CENTURYLINK database management services as set forth in this Technical document.

Next Gen 9-1-1 Routing allows for specific call routing rules to be defined by CENTURYLINK. These include, but are not limited to:

- Selective Routing
- Trunk Only Routing
- PSAP Abandonment Routing
- Alternate Routing
- Default Routing
- Any other optional routing functionality that may become available through Next Gen 9-1-1 Routing services

PSAPs will work with CENTURYLINK to define and manage the PSAP's 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.

2.0 INCREMENTAL ALI MANAGEMENT SERVICES

IPSR Routing service requires the input of SRDB updates from the TSS database management system. As such, all TNs/ESRks/ESRDs/ESQks that are to be routed with the Next Gen 9-1-1 Routing solution must be managed through the TSS database management services.

2.1 ALI TO ALI STEERING FOR WIRELINE 9-1-1 CALLS

As part of Next Gen 9-1-1 Routing services, CENTURYLINK will initiate communications with non-CENTURYLINK ALI providers for ALI to ALI steering via CENTURYLINK provided IP connectivity. ALI to ALI steering will be performed for wireline 9-1-1 calls only.

CENTURYLINK acknowledges that ALI to ALI steering covered by this Technical document will only address the steering scenarios defined in Section 2.1.

CENTURYLINK acknowledges that coordination will be required between CENTURYLINK and other 9-1-1 service providers in the assignment and on-going management of English Language Translations ("ELTs") (ESN/ESSIDs). Without this coordination, the ELTs may not work properly. CENTURYLINK cannot guarantee the cooperation of other 9-1-1 service providers.

In the event that there are multiple 9-1-1 service providers in the area, CENTURYLINK will initiate efforts to work with these service providers to identify the appropriate method of obtaining the ALI data. The following ALI to ALI steering scenarios are not covered by this Technical document (see Section 2.2, Out-of-Scope requests):

- The non-CENTURYLINK ALI system does not support ALI to ALI steering.
- The non-CENTURYLINK ALI system ALI to ALI interface does not meet the CENTURYLINK interface specification.
- The selective router (SR) owner differs from the ALI owner.

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- The PSAP is served by multiple SRs, but trunk number sent in each wireline ALI Query does not correspond to the SR.
- The PSAP receives transferred calls from multiple Non-CENTURYLINK PSAPs served by different non-CENTURYLINK ALI systems, but multi-steering rules cannot be configured to distinguish which non-CENTURYLINK ALI to query.

2.2 OUT-OF-SCOPE REQUESTS

PSAP requests that are beyond the scope of the deliverables outlined in this Technical document will require an enhancement request to CENTURYLINK. CENTURYLINK will reply using the Document of Understanding (“DOU”) form outlining PSAP’s request and CENTURYLINK’s proposed solution. CENTURYLINK will respond in writing, as needed.

2.3 ENHANCEMENTS FOR NEXT GEN 9-1-1 DATA PSAPs

CENTURYLINK will complete and maintain Next Gen 9-1-1 Data and ALI-M enhancements to support ALI to ALI steering for PSAPs using Next Gen 9-1-1 Data

3.0 PS/ALI

The PS/ALI product will allow Private Switch or Centrex End Users within the CENTURYLINK region to manage Private Switch Subscriber information specifically allowing the Private Switch or Centrex End Users to create and update Private Switch Subscriber records with detailed station-level location information. The Private Switch detailed, station-level Subscriber information will be available to the PSAP during a 9-1-1 call to allow emergency responders to know the location of the calling party from a Private Switch system in a large or multi-building facility. These services are governed by this Technical document. Charges for these services will be handled in the following ways:

- Existing CENTURYLINK PS/ALI customers that are converted to a 9-1-1 routing that require CAMA trunks to be moved to the West LNG will be converted at no charge and monthly port fees will be waived
- New CENTURYLINK PS/ALI customers will require the appropriate network security measures in place, at no cost to West.
- New CENTURYLINK PS/ALI customers that require CAMA trunks to be terminated on the West LNG will be charged PS/ALI fees as stated in the tariff.

4.0 NEXT GEN 9-1-1 ROUTING INFRASTRUCTURE

The Next Gen 9-1-1 Routing infrastructure is comprised of redundant, regionally diverse facilities that process an inbound emergency call and successfully presents the emergency call to the PSAP. The current infrastructure design is as follows: call enters the CENTURYLINK Next Gen 9-1-1 Routing network from the End Office (EO) through at least a pair of Legacy Network Gateways (LNGs) and, utilizing a set of pre-determined routing rules, is presented over a private iQ MPLS private port to the PSAP. Next Gen 9-1-1 Routing has the ability to deliver the emergency calls to the PSAP as 8 or 10 digit ANI using one of two methods, depending on the capabilities of the PSAP’s Customer Premise Equipment. These methods are:

- Receipt of EO traffic over SS7, CAMA, PRI and/or IP
- Receipt and delivery of Selective Router Traffic (Call transfers and call handoffs) over SS7.
- Delivery over the private iQ MPLS private port and at the PSAP site, converting the signaling back into CAMA through the provided PSAP Gateway Managers (PGMs), using standards specified in NENA 04-001.
- Delivery over the iQ MPLS private port directly to the PSAP’s CPE. The CPE must be capable of accepting emergency voice calls over IP and has been validated to be compatible with CENTURYLINK’s Request for Assistance Interface (RFAI), West’s ESRP Terminating Interface for A9-1-1 or Airbus specifications.
- As PSAPs migrate from CAMA deployments to SIP, the connectivity model will change. As part of SIP deployment, the PSAP’s connectivity will go through additional network management and security devices (such as Session Border Controllers and Firewalls). This connectivity model change will not cause a change in the cost to CENTURYLINK and/or the PSAP.

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- ISDN PRI to the PSAP is not currently supported.

5.0 CENTURYLINK NEXT GEN 9-1-1 NETWORK DESIGN

Following the execution of the Agreement, CENTURYLINK and PSAP will finalize the detailed design of the Next Generation 9-1-1 call routing network delivering emergency calls to the PSAP.

CENTURYLINK will authenticate all other third-party service provider's data applications through CENTURYLINK infrastructure. Furthermore, the Parties will incorporate into this Technical document a mutually agreed upon Statement of Work defining (i) CENTURYLINK's suite of Next Gen 9-1-1 Service data applications, and (ii) the Parties' roles, responsibilities and obligations regarding said applications. The Statement of Work will contain interface specifications associated with authentication. CENTURYLINK will provide to PSAP a brief description of each third-party application, a brief description of the application authentication and a notification of acceptance. If any third-party service provider's application fails to authenticate, CENTURYLINK will provide a copy of the outline sent to the third-party provider detailing the portion of the authentication that failed and any corrective actions that need to be taken in order to authenticate.

All private ports between CENTURYLINK ECMC and the PSAP will be assigned to a dedicated Closed User Group (CUG) and follow the authenticate process as mutually agreed upon.

No application will be activated without the PSAPs direct authorization. The authentication process will include an assessment and identification of the bandwidth impact.

5.1 IP TO HOST

CENTURYLINK will provide diverse IP connectivity through diverse POPs via the CENTURYLINK provided iQ MPLS private port from the ECMC to the PSAP (VIPER or VESTA) Host.

5.2 PUBLIC SAFETY IQ MPLS PRIVATE PORT REQUIREMENTS

CENTURYLINK will provide IP connectivity between Next Gen 9-1-1 Routing ECMCs and the PSAP site. All equipment to be deployed at the PSAP to support Next Gen 9-1-1 services will be supplied by CENTURYLINK.

The CENTURYLINK provided IP connectivity from the Next Gen 9-1-1 Routing solution to the PSAP will meet the following requirements:

- Redundant and diverse IQ MPLS private port connectivity to the PSAP, where facilities allow.
 - A maximum 150 millisecond Round Trip Time (RTT) through network, assuming 500 bytes sustained for 1 minute without packet loss.
 - The iQ MPLS private port will have the appropriate levels of security in place both at the physical and application layers to provide for 99.999% availability.
 - 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
 - The CENTURYLINK provided iQ MPLS private port will meet the industry standard P.01 grade of service. P.01 will be applied from CENTURYLINK sites to the PSAP over the CENTURYLINK supplied network.
 - Card level mapping will be provided when orders for circuits are placed. CenturyLink will disclose where any single points of failure may exist due to network convergence.
-

5.3 NETWORK PROTOCOLS

The ESnet design is based on current open industry standards and NENA i3. Network components are based on Cisco IOS software. The Cisco IOS software DiffServ is fully compliant with the Internet Engineering Task Force (IETF) standards defined in RFC 2474, RFC 2475, RFC 2597 and RFC 2598.

Quality of Service

The primary network between the data center and PSAPs will implement Quality of Service (QoS) to manage and prioritize any type of IP traffic (voice, data, and multi-media). QoS is performed primarily

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through packet marking with Differentiated Services Code Point (DSCP) for scalable management of network traffic. The audio stream (Real Time Transport Protocol - RTP) is marked with "Expedited Forwarding," the highest class of service available. This is appropriate for real-time media like voice, and is mapped to a priority queue. Signaling packets (Session Initiation Protocol or Media Gateway Control Protocol) are placed in another queue. This prioritization of packets ensures that voice packets get the highest priority in the network.

Encryption

RTP is not specifically encrypted to the user; however, transport between devices over IP access clouds is encrypted using standard IPSEC (AE256) tunneling.

Mean Opinion Score

Edge routers in the ESInet perform constant quality testing back to the core data centers by sending a stream of synthetic RTP packets across the tunnels that traverse the IP network via Cisco's IPSLA (Internet Protocol Service Level Agreement) functionality. The IPSLA configuration is managed by the PSAP edge routers towards the routers at the data centers. The core routers then change the sequence number and timestamp on each synthetic RTP packet, which is then retransmitted back to the remote site router.

This generates a four-second stream of RTP towards the mGRE interface on the data center edge router, using the same G.711 codec used for the voice application itself. One hundred packets are sent with an interval of 40 milliseconds. The test restarts after five seconds (each test is padded with an extra second to avoid overlapping tests). The Cisco IPSLA application then derives both Impairment Calculated Planning Impairment Factor (ICPIF) and MOS (Mean Opinion Score) values from these detailed test results.

If the MOS score drops to 4.00 or below, a Cisco Embedded Event Manager (EEM) script will failover the call over to the alternate IP network instance with no impact to the quality of the call. The EEM will continue to monitor the "failed" path and will require 16 consecutive four-second tests scoring above a MOS of 4.0 in order to begin using the previous MPLS path. With this configuration, the system will consistently achieve greater than 4.0 MOS.

The Center of Excellence network operations center (NOC) will actively monitor the network's quality using the industry standard MOS that automatically activates alarms on the router if the MOS score dips below a specific value. When this occurs, the router will automatically route all traffic over the redundant IP network route.

Included Protocols and Technology:

- Border Gateway Protocol (BGP)
- Cisco Express Forwarding Multilayer Switching (CEF-MLS)
- Cisco Internet Protocol Service Level Agreement (IPSLA)
- Connectivity Fault Management (CFM)
- File Transfer Protocol (FTP)
- Hypertext Transfer Protocol Secure (HTTPS)
- Internet Protocol Security (IPSEC)
- IEEE 802.1Q (Dot1Q)
- Link Aggregation Control Protocol (LACP)
- Media Gateway Control Protocol (MGCP)
- Multipoint Generic Routing Encapsulation (mGRE)
- Multiprotocol Label Switching (MPLS)
- Microsoft Message Queuing (MSMQ)
- Open Shortest Path First (OSPF)
- Real Time Transport Protocol (RTP)
- Rapid Spanning Tree Protocol (RSTP)
- Session Initiation Protocol (SIP)
- Simple Network Management Protocol (SNMP)
- Secure Shell (SSH)

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- Transmission Control Protocol / Internet Protocol (TCP/IP)
 - Virtual Router Redundancy Protocol (VRRP)
 - Virtual Local Area Network (VLAN)
 - Virtual Routing and Forwarding (VRF)
-

5.4 IP ADDRESS SCHEMA

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, VIPER and VESTA Hosts, and PSAPs, including CENTURYLINK POPs.

5.5 STANDARD SECURITY PROCEDURES

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 the CENTURYLINK-provided iQ MPLS private port using industry standard security procedures against security attacks from other networks or the public Internet. The CENTURYLINK-provided iQ MPLS private port will be a virtual private network, with IP addresses not publicly accessible via the public Internet. CENTURYLINK will work with PSAP customer as needed to ensure router configurations meet PSAP customer security requirements, provided such requirements do not conflict with CENTURYLINK internal security procedures.

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)

5.6 WEST DATA CENTERS AND NG9-1-1 SECURITY

Wests' cyber security policies, standards, and guidelines are compliant with industry best practices as defined by International Organization for Standardization and Control Objectives for Information and related Technology (COBIT). Wests' expertise and commitment to network security are evidenced by our active participation in the Network Reliability and Interoperability Council (NRIC) 7 focus group 2B Cyber-Security. Wests' next generation emergency services network is a secured and private IP managed network. All inbound and outbound traffic is through well defined and controlled access points. Call processing and real-time data delivery are implemented through specialized subnets.

West employs a defense-in-depth security strategy to protect sensitive information. Such controls include, but are not limited to stateful packet inspection firewalls (host and network based), IDS/IPS, ACLs, Role-based Access control, two-factor authentication, encryption, and AV (email and host). Furthermore, systems are protected with build standards, patch management, and regular vulnerability scans.

Sensitive data is housed in our data centers with logical and physical access controls. Development environments are separate from production and production data is not used in dev or SQA.

Data that transits untrusted networks (leaves West custody) through applications or communication channels with encryption to safeguard confidentiality and integrity.

Finally, West employs an Incident Handling process modeled on FEMA's Incident Command System. Notifications are built into this process.

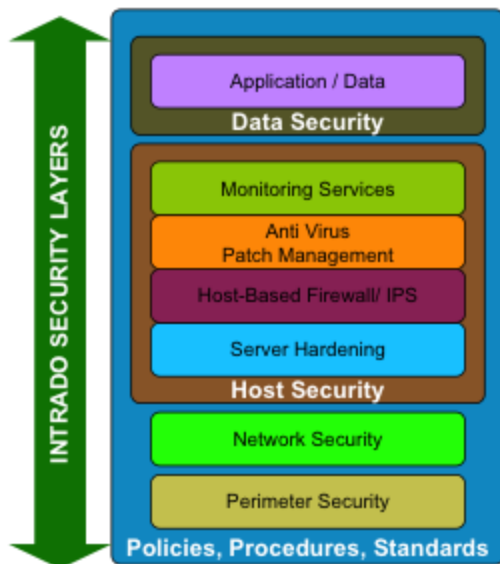
West infrastructure is built to withstand sophisticated attacks (including DDOS) by means of a defense in depth strategy. West employs high availability systems with redundancy at geographical, carrier, circuit, power, application, and system levels. System/Application availability is safeguarded with clustering and load balancing techniques. Furthermore, Wests' security architecture employs defenses that include, but are not limited to, Stateful packet inspection firewalls, IDS/IPS, multi-factor authentication, strong encryption, anti-virus/anti-malware, and vulnerability/patch management solutions. All inter-zone traffic is restricted to only the necessary protocols/destinations, both ingress and egress.

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The West infrastructure is built to withstand sophisticated attacks, including Distributed Denial of Service (DDOS) attacks, by means of a defense in depth strategy. Defense in Depth is designed to defend a system against any particular attack using several, varying methods. It is a layering tactic, conceived by the National Security Agency (NSA) as a comprehensive approach to information and electronic security. Defense in depth is the coordinated use of multiple security countermeasures to protect the Confidentiality, Integrity & Availability of the information assets in an enterprise. The strategy is based on the military principle that it is more difficult for an enemy to defeat a complex and multi-layered defense system than to penetrate a single barrier. Defense in depth minimizes the probability that the efforts of malicious hackers, Viruses and Malware will succeed. A well-designed strategy of this kind will help the West security personnel, network engineers, and system administrators, identify entities that attempt to compromise the Wests' computers, servers, and networks. If a malicious attempt is launched against one of the Wests' resources, defense in depth will minimize the adverse impact and give West personnel time to deploy new or updated countermeasures to prevent recurrence.

The placement of protection mechanisms, procedures and policies is intended to increase the dependability of the West systems where multiple layers of defense prevent direct attacks against the West systems. Components of defense in depth are identified below and include firewalls, intrusion prevention and detection, data / network segmentation. Any combination of these measures can and should be deployed in accordance with the business continuity determination, risk assessment, and customer requirements for a given product opportunity.



Defense in Depth Strategy

The West ESInet solution provides for all of the necessary appliances and security services including firewalls, routers, switches, intrusion detection services, and cabling for securing the NG9-1-1 applications and appliances located at the data centers.

5.7 CENTURYLINK DATA CENTERS AND NG9-1-1 SECURITY

Please see attached CENTURYLINK Data Center Brochures.

Additional Notes:

- All entry points are locked continuously or on an access control system
- All employees, guests, and contractors are required to use a single entry point
- All employees, guests, and contractors are required to badge in and out
- Data Centers are manned 7/24
- A visitor to a Savvis facility, who is not an authorized Customer, Employee, and Contractor will be considered a Visitor and must demonstrate a legitimate business purpose for visiting the site. The Visitor must be escorted by an authorized Savvis escort at all times. Authorized escorts are

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Savvis employees or customers who have been issued a permanent ID badge and are in good standing with Savvis and are permitted to escort up to five visitors at one time. Groups of six or more visitors must be processed as a Data Center Tour. Contractors and third-party vendors are not permitted to sponsor Visitors.

- Visitors are required to show ID with photograph before entering data centers
- Background criminal checks are performed on all employees with access to the data centers

5.8 APPROPRIATE LEVELS OF SECURITY

West

West Internet accessible systems, including the subscriber record management data exchange portal, database management interface tool, and metrics tool, are protected by a secure access process that requires authentication through a unique user name, unique user password, and a code randomly generated at time of access via a secure ID token. The use of this secure ID restricts users to accessing and viewing only their own data, protecting confidentiality. Passwords are force changed and monitored on regular intervals.

West network is capable of processing all traffic, but administratively denies protocols identified as a threat or that otherwise fall outside of pre-defined parameters. This is partially managed via routing tables and/or Access Control Lists (ACLs). West continually investigates and upgrades with new advances in protective technology with tools such as Intrusion Detection System (IDS).

The solution incorporates physical, network, and application security principals. Traffic between core processing sites and distributed sites (e.g., ingress call traffic, PSAPs, management capabilities) is route and protocol secure. A combination of route paths, IP address recognition, limited protocols, VPNs, session border controllers, and firewalls secure the various communication elements of the solution.

West deploys firewalls and other network security devices and software to protect against inbound network threats on the servers that make up the ESInet. West also employs a regularly scheduled patching process to protect against the effects of malware. Computing devices are subjected to thorough security scans so that there are no malware elements present. Access to processing elements is restricted to authorized personnel. Network connections from solution components are limited to those connections needed for operation and maintenance. Physical and network access to production components are restricted to those that have an operational responsibility and all activity is audited and monitored.

All development environments are fully separate from production environments. All hardware and software elements that are deployed in a production environment go through stringent release management processes that incorporate thorough testing and scans.

It should be noted that during the requirements analysis and design phases of the project, the State, 9-1-1 entities, and the West project teams investigate any connections to networks outside the scope of this Services Exhibit, for example connections to other public safety agencies or connections to the Internet, so that all safeguards, including firewalls, are in place.

West facilities and nodes are equipped with physically redundant data communications and power equipment such that any component can be maintained without overall service impact. Buildings and supporting facilities such as generators, fuel, and entrance demarcations require card access and are monitored 24 hours a day by security personnel. Additionally, biometric readers and card access portals are deployed in areas containing critical infrastructure components.

West is a member of the Government Emergency Telecommunications Service (GETS) that is used in the event our core communications cannot be used. West personnel sit on the board of the telecommunication industry and government's National Coordination Counsel, which is the coordinating group for cyber threats and terrorism. This allows us to stay abreast of national and international threats that may affect the Next Gen 9-1-1 infrastructure and mitigate changes as necessary.

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West's Information Security department operates an enterprise-wide vulnerability management program to verify that all hosts and network devices meet rigid standards of configuration and hardening. This program ensures not only deployment verification, but also ongoing oversight of system level protections throughout the lifecycle of the system.

Vulnerability management at an enterprise level provides visibility to systems added and removed from any area of West's network infrastructure, allowing an always-on view to changes which may impact the security posture of the organization.

Intrusion prevention systems complement other network related protections in place, and are another layer of information assurance. These systems are continuously monitored by networking professionals, and provide real-time intelligence regarding traffic flows and the internal or external elements involved in transmission.

Intelligence reports both from internal sources, as well as from external entities including US-CERT, the Internet Storm Center, the Homeland Security Advisory System and other open-source vulnerability research assets are reviewed for vulnerabilities, anomalies, or indications of non-optimum activity, and Information Security Officers interface with all levels of the organization, including IT, management, business units and customers to effect resolution of issues related to network, application and systems security. Information Security Officers and management review numerous open and classified sources of information on a weekly basis in order to respond as necessary to a world socio-political climate which requires constant vigilance with regard to West's commercial and public safety business.

Information Security Officers also have a Communications Security (ComSec) Custodial function, being the source of expertise and policy and technical direction regarding the use of cryptography for all electronic communications to achieve the organization's confidentiality, non-repudiation and integrity objectives. Key escrow and other capabilities are managed by Information Security Officers.

Information Security operates corporate perimeter protection capabilities, including firewalls of various types. Officers provide direction as required by senior management to engineering and other areas of the company regarding perimeter protection. Technical security policy is recommended by Information Security Officers to management, ad hoc as well as in scheduled policy reviews.

Information Security Officers also serve an advisory capacity to all levels of management regarding threats and their mitigation with regard to the company's information assets. Officers are expected to advise and maintain the highest standards of operational security. Operational security practices, as forwarded by the Information Security Department, are a vital component of the organization's security posture. These include but are not limited to employee training, recommendations regarding physical security, auditing and employee relations.

CENTURYLINK Technicians and Engineers

CENTURYLINK hiring process includes background checks on all of our employees (including 9-1-1 technicians). CENTURYLINK also provides background checks on our registered sub-contractors and product partners. Our comprehensive background checks include all of the important searches.

In addition to the CENTURYLINK background checks, our 9-1-1 centers complete fingerprinting and additional background checks on all CENTURYLINK employees and subcontractors.

6.0 SYSTEM BACKUPS & REDUNDANCY

6.1 WEST

A9-1-1 Systems are backed up with Symantec NetBackup on hardware that is sized to support the entire enterprise. Documentation for the backup processes is maintained at West facilities and may be viewed in an audit process. Audit activities taking place within West facilities would require prior vetting of any personnel to enter the facility. Collateral may be reviewed but must remain within the West facility.

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Network configuration management tools perform the following functions:

- Detect and report on configuration policy violations to ensure compliance with corporate standards.
- Utilize configuration templates and command templates, custom scripts, and configuration changes to ensure consistent implementation of network configurations across similar site types
- Simultaneously modify configurations, change community strings, update ACLs, and block MAC addresses across many devices
- Compare start-up and running configuration files to troubleshoot device configurations issues
- Automatically check all network elements for changes and perform backup for all changed network device configurations on a daily basis
- West network configuration tools provide version control and “rollback” functionality to all network elements. This allows the restoral of previous “known good” configurations, or timely restoral of stored configurations in the event of equipment failure or disaster recovery.

West’s provisioning, monitoring, and backup systems are redundant between Longmont, Englewood, and Miami. West’s NOC staff is located in Longmont and can be relocated to either of the other centers if there is a need.

6.2 AIRBUS

Airbus Communications’ Disaster Recovery is highly effective in minimizing call taker position and server downtime. Through perfect snapshots of the monitored system, a system can be quickly restored to any saved working state while preserving current data files.

- **Snapshot Backups.** Disaster Recovery “snapshot” software consists of a client and server component; client software would be installed on all clients/servers within the scope of the specific contract between Airbus Communications and Customer addressing this issue. Clients are backed up to the appropriate Network Management Server location.
- **Disaster Recovery.** If a system fails, using the normal notification processes, Airbus Communications will roll the system back to a known good state. This is conducted in concert with first tier maintenance for the respective site. All data will be stored on-site and local NAS devices.

Disaster Recovery

This service provides scheduled backups of all Airbus Communications provided servers and workstations to the Network Management Server (NMS). The NMS will manage the Call Center site backups.

If a system fails (virus infection or corrupted install, etc.) the following process will be remotely implemented by Managed Services in conjunction with on-site personnel.

- With assistance from the CENTURYLINK Tech, Managed Services will create a startup disk on the NMS for the specific workstation or server that requires recovery.
- The CENTURYLINK Tech will boot the computer with the startup disk and notify Managed Services that the system is up and that the recovery process can begin.
- Managed Services implements the recovery process and notifies the CENTURYLINK Tech once completed.
- The CENTURYLINK Tech tests the workstation/server – with assistance from Managed Services – and confirms the computer recovered and available for use by the site.
- Managed Services provides a device recovery confirmation e-mail to the Telco.

Reporting

Airbus Communications Disaster Recovery system maintains data to provide monthly reports as illustrated below. The goal of the report is to provide the PSAP insight as to the frequency of full and incremental backups performed during the previous month.

The goal of the Backup Recovery report is to provide the PSAP insight as to the number of backups being performed on a monthly basis. The number of backups will be consistent on a month to month basis, except if a problem occurs where a restore is required or a deployment of a new version of application software is performed.

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Disaster Recovery Management Activity	Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	YTD
Total Backups	39	65	52	52	44	60	312
Total Recoveries	0	0	0	0	0	0	0

Backup/Recovery Report Example

- **Total Backups** – This section identifies the number of backups performed during the previous months
- **Total Recoveries**- This section identifies the number of restores of a backup performed during the previous months

7.0 NEXT GEN 9-1-1 ROUTING SERVICES

7.1 ROUTING RULES

Next Gen 9-1-1 Routing processes all inbound emergency calls and successfully presents the emergency calls to the PSAP in accordance with the routing rules determined with CENTURYLINK and provisioned during the implementation stage. Next Gen 9-1-1 Routing allows for specialized management of wireline, wireless, and VoIP call types so that different call types may have the ability to have separate routing policies for originating delivery, transfer, fail over, choking, etc. For example, SMS is routed differently based on a PSAPs selection of delivery method (i3, browser, TTY). Call types are determined based on the incoming call source facility (e.g. MSC, End office), as well as the information provided within call signaling.

Next Gen 9-1-1 Routing will support flexible routing instruction rules, depending on CENTURYLINK-established preferences and needs. To this end, CENTURYLINK will provision the following based upon CENTURYLINK’s requirements for the PSAP:

- Each incoming End Office connection (IP or TDM) is identified for the appropriate routing treatment. The current routing treatments are identified below:
 - **Selective Routing:** Routing rules are based upon the calling party ANI. Routing is determined based upon the ANI match to an ESN (Emergency Services Number) and an Electronic Switching System Identification (“ESSID”).
 - **Trunk Only Routing:** The incoming End Office trunk is assigned an ESN/ESSID which relates to a specific ingress trunk group. Trunk Only Routing is available for TDM traffic only. A comparable method is employed for ingress IP connections.
 - **PSAP Abandonment Routing:** Specific routing instructions to be applied in the event that the PSAP must evacuate its facility. This can include routing the calls to busy.
 - **Alternate Routing:** Specific routing instructions to be applied as alternate location for routing in the event that all lines to the primary PSAP are busy, or the primary PSAP is closed for a period of time. Multiple, prioritized alternate route destinations are supported. This can include routing the calls to busy.
 - **Default Routing:** Specific default routing instructions to be applied for each incoming trunk group. 9-1-1 calls are routed to the default PSAP in the event of an ANI failure, unintelligible digits received from end office (ES) or control office (EM), or other rare causes. In the event of ANI Failures, a Default ESN will be assigned based on the Ingress Trunk/Path.
 - **Destinations and Route Lists:** The solution is able to specify a unique route list for each routing rule. These route lists allow for designation of a primary target with numerous prioritized alternate destinations such as:
 - PSAP served by Next Gen 9-1-1 Routing
 - PSAP served by a non- CENTURYLINK selective routing service
 - PSTN number
 - Busy
 - Treatment message
 - Tone

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- **PSAP Trunk Group Management:** Each incoming trunk is individually designated to carry a particular call type and/or combination of call types. The solution provides the ability to manage call type designations thereby changing the mix of call types

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.

7.2 TRANSFER AND BRIDGING

Next Gen 9-1-1 Routing will support the following flexible transfer/bridge capabilities following NENA 03-003 Tandem to Tandem Transfer. (These transfers only occur via SS7). Specific connectivity specifications for SR to SR connectivity are spelled out within *Foreign Selective Router Interface Specification*.

- **Selective Transfer/Bridge:** The ability for the call taker to transfer an incoming 9-1-1 call to another agency by pressing a button labeled with the type of agency; e.g., "Fire," on the PSAP premises equipment. These transfers utilize pre-provisioned Star Codes (*01-*06) on a per-PSAP basis. In order to match the functionality that CENTURYLINK has deployed within its region, CENTURYLINK will need to expand the number of Selective Bridge Star Codes to 01-06/*11-*16.
- **Fixed Transfer/Bridge:** 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 (*20-*49) on a per-PSAP basis. In order to match the functionality that CENTURYLINK has deployed within its region, CENTURYLINK will need to expand the number of Fixed Bridge Star Codes to *99.
- **Manual Transfer/Bridge:** The ability for the call taker to complete a manual transfer, by way of 10-digit dialing and delivery via PSTN.
- **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 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 which is currently planned for late 2015 delivery and is subject to change.

7.3 VOICE AND DATA TRANSFER

The Parties recognize that the individual TSPs will be responsible for installing and maintaining connectivity from all supporting TSP End Offices/MSCs to the CENTURYLINK LNG POPs.

CENTURYLINK and the TSP will be responsible for working together to jointly install and maintain connectivity between the CENTURYLINK SRs and alternative service providers serving PSAP and at least two CENTURYLINK LNG POPs to support voice transfers of PSAP to/from PSAPs residing on the CENTURYLINK SR(s).

CENTURYLINK will work with each non-CENTURYLINK ALI host provider to establish communications with each non-CENTURYLINK ALI host provider via the CENTURYLINK provided IP connectivity.

7.4 TRANSFERS BETWEEN CENTURYLINK LSR AND ALTERNATE PROVIDERS LSR

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 scope of the current offering.

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:

- 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.

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- Allows call transfer with additional information, such as ALI, and depending on CPE, case notes and TTY, between PSAPs still on the legacy tandems and PSAP on the ESInet.
- Allows call transfer with additional information, such as ALI, and depending on CPE, case notes and TTY, between PSAPs on the ESInet and PSAPs on the legacy tandems.

West 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.

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. West realizes there may be specific cases during the migration process where LPGs may be required and will be provided. If required, specifications of the LPG are provided below:

LPG

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.

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 (CIDBs) 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.

i3 PSAP LSR Transfer Limitations

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 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.

7.5 IMPLEMENTING AND MAINTAINING CONFIGURABLE PSAP ATTRIBUTES

At a minimum, the following data elements will be configured by CENTURYLINK for PSAP. While initial provisioning will occur during the migration preparation period, the CENTURYLINK or PSAP authorized personnel may request modifications to the provisioning to meet its changing needs:

- PSAP Trunks:
 - NPD assignment (if appropriate)
 - Trunk assignments by call type (wireline, wireless or VoIP)
 - Add or delete trunk members
- Route Lists/Routing Rules:
 - Primary and alternate routes
 - Selective transfer list/star code destinations for first responders, Police Department, Fire, and Emergency Medical Services
 - Fixed bridge lists such as poison control or neighboring PSAPs
 - PSAP abandonment routing rules

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CENTURYLINK will work with each TSP to gather and confirm information to support data provisioning for trunks incoming from the End Office to the Next Gen 9-1-1 Routing network including the following data:

- Incoming signal type
- Call type
- Implied numbering plan administration (“NPA”), if applicable

7.6 NEXT GEN 9-1-1 SELECTIVE ROUTING DATABASE UPDATES

West's TSS Database Management system, operated under contract to CENTURYLINK as a 9-1-1 Service Provider, will provide Next Gen 9-1-1 Routing SRDB updates to the SRDB in the following manner: SRDB updates will be created by CENTURYLINK's TSS Database system for all records that have successfully passed data validation. SRDB updates will be delivered to the Next Gen 9-1-1 Routing system by the next calendar day following successful data validation.

8.0 MONITORING, MAINTAINING, AND TECHNICAL SUPPORT

CENTURYLINK will be responsible for ongoing support and maintenance of the Next Gen 9-1-1 Routing network design and implementation. This includes the monitoring and maintenance of call processing so to reduce and limit effects of call congestion.

CENTURYLINK will be responsible for ongoing support and maintenance of the Next Gen 9-1-1 Routing network hardware and for the provision of necessary upgrades to support the operations of Next Gen 9-1-1 Routing as defined in this Technical document. This responsibility does not include enhancements, features or functionality beyond the scope of this Technical document.

CENTURYLINK has responsibility for 24x7x365 monitoring, maintenance, and technical support of the CENTURYLINK-provided MPLS network and components as further delineated above. This section describes the monitoring, maintenance, and technical support for the non-CENTURYLINK components of the solution that will be provided by CENTURYLINK.

CENTURYLINK will provide PSAPs with a 24x7 point of contact to report network related issues and will make a commitment to resolve network issues in the shortest amount of time feasible.

8.1 MONITORING

CENTURYLINK will monitor each Next Gen 9-1-1 Routing node on a 24 hour, 7 days per week, 365 days per year basis. CENTURYLINK performs monitoring of all communications links, including between the Next Gen 9-1-1 Routing network and CENTURYLINK's PSAP. CENTURYLINK is responsible for detecting application and network failures on CENTURYLINK's Next Gen 9-1-1 Routing nodes. CENTURYLINK will follow notification procedures as jointly agreed upon between CENTURYLINK and PSAP Customer.

8.1.1 Network Monitoring

The CENTURYLINK data communications hardware used to terminate circuits will be capable of automatically rerouting traffic in the event of a facility failure where redundant connectivity is available. In addition, CENTURYLINK will measure and report on call delivery times within the Next Gen 9-1-1 Routing solution. CENTURYLINK measures Call Delivery Times from the call's entry into CENTURYLINK network to the delivery of the call to the PSAP's Equipment (ANI/ALI Controller). The type of deployment will affect the estimated Call Setup Time.

Within an 8 or 10 digit CAMA deployments, the Call Setup Time duration shall not exceed 5 seconds from the time the call is received by CENTURYLINK LNG.

Within an IP deployment (RFAI), the Call Setup Time duration shall not exceed 3 seconds.

The Call Setup Times for the CENTURYLINK deployments are reported within the Call Setup Time reports.

CENTURYLINK will monitor and analyze the network and equipment as appropriate to meet CENTURYLINK's obligations in this Technical document.

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8.1.2 Monitoring PSAP Circuit Alarms

CENTURYLINK will be responsible for monitoring the CENTURYLINK-provided IP connectivity between the PSAP and CENTURYLINK's ALLI servers and Next Gen 9-1-1 Routing system. CENTURYLINK will provide timely communications to PSAP customer regarding any facility or service conditions that will affect the operations of Services. CENTURYLINK will provide testing support on a 24 hour, 7 days per week, 365 days per year basis, when required to evaluate PSAP circuit problems.

CENTURYLINK is responsible for testing network connectivity from demarcation point at the PSAP and the Next Gen 9-1-1 Routing Service equipment installed by CENTURYLINK at the PSAP. CENTURYLINK will provide timely communications to PSAP customer and STATE regarding any facility or service conditions that will affect the operations of the Next Gen 9-1-1 system. CENTURYLINK will provide testing support when required to evaluate CPE connectivity problems.

8.1.3 Trouble Tracking / Escalation

Each Party will participate in the tracking of trouble reports and will provide escalation procedures and contacts to the other Party. CENTURYLINK's Program Manager and PSAP's Program Manager point of contact will develop the escalation procedures during the implementation phase.

8.1.4 Interface with Application Support

CENTURYLINK's primary point of contact will be the Program Manager for PSAP and PSAP personnel who need to interact with CENTURYLINK's application support personnel.

8.1.5 PSAP Problem Investigation

CENTURYLINK has primary responsibility to investigate PSAP problems related to these services. In the event that the issues are determined to not be Next Gen 9-1-1 related, CENTURYLINK will assist PSAP in solving PSAP problems.

8.2 MAINTENANCE

8.2.1 System Upgrades

CENTURYLINK will notify STATE and PSAP customer at least 10 business days in advance of planned events and be responsible for ongoing support of the Next Gen 9-1-1 Routing network and for the provision of necessary modifications and upgrades to support the operations of the Next Gen 9-1-1 Routing network as described in this Technical document. CENTURYLINK may need to apply changes to its software applications in response to emergency situations and will notify STATE and PSAP customer at the earliest possible time.

8.2.2 Premise Equipment

CENTURYLINK will be responsible for the ongoing support/maintenance for all CENTURYLINK PSAP Network Equipment provided under this Technical document.

8.3 TECHNICAL SUPPORT

8.3.1 Contact Procedures

CENTURYLINK Contact Procedure: For service disruptions CENTURYLINK provides twenty-four (24) hour, seven (7) days per week support services. CENTURYLINK provides a 9-1-1 Operation Center Number for service disruptions and connectivity issues identified by CENTURYLINK, State, or PSAP. CENTURYLINK will record issues reported by State or PSAP including problem description, service impact, and other pertinent information.

PSAP Contact Procedure: Where CENTURYLINK has identified a PSAP affecting service disruption, CENTURYLINK provides initial notification and updates to the identified State and/or PSAP contacts according to the guidelines established and agreed to between CENTURYLINK and PSAP.

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8.3.2 CENTURYLINK Responsibilities

CENTURYLINK has primary responsibility to investigate PSAP problems and determine if they are caused by CENTURYLINK or PSAP-owned network or equipment. CENTURYLINK will work cooperatively in resolving problems related to Next Gen 9-1-1 Routing. CENTURYLINK will be responsible for solving any problems caused by CENTURYLINK PSAP Network Equipment in addition to all Next Gen 9-1-1 Routing equipment hosted at CENTURYLINK facilities.

8.3.3 PSAP Caused Service Disruptions and Out of Scope Technical Support

The PSAP may report PSAP-caused service disruptions to CENTURYLINK either verbally or by written notice, or as CENTURYLINK otherwise reasonably requires. Likewise, CENTURYLINK may report PSAP-caused service disruptions detected by CENTURYLINK personnel to the PSAP. Technical support and related services for incidents or service disruptions that CENTURYLINK determines relate to systems, equipment, or network issues that are not part of the Next Gen 9-1-1 Routing network (including those on the PSAP side of the demarcation point), or are otherwise not CENTURYLINK's responsibility hereunder, will be worked jointly with the PSAP and/or PSAP.

8.3.4 Incident Management

When a PSAP-affecting issue is identified, which impacts Next Gen 9-1-1 Routing call delivery to a PSAP, it will be flagged as an incident CENTURYLINK coordinates communication, monitoring, and resolution of the issue. The team also documents appropriate items, which may include root cause analysis, CENTURYLINK/PSAP impacts, countermeasures, and resolution.

8.3.5 Technical Support

CENTURYLINK will provide additional technical and support resources as necessary to deliver on customer expectations and program goals. This would include, but not be limited to:

- Managed NG9-1-1 Program Manager
- Managed NG9-1-1 Project Manager
- Managed NG9-1-1 Account Consultant
- Managed NG9-1-1 Lead trainer
- Managed NG9-1-1 Service Manager
- Managed NG9-1-1 Lead Process Analyst
- Managed NG9-1-1 Field Technicians

Planned Events

Planned events are scheduled for changes that may be CENTURYLINK or PSAP impacting. A notification of the upcoming event will be sent by CENTURYLINK Program Manager to PSAP at least 10 business days in advance of the scheduled change.

Planned events do not include changes that are applied as part of normal business operations. The provisioning of data elements, applying PSAP requested parameter changes and the like are not included in the Planned Event process.

- CENTURYLINK will perform quarterly preventative maintenance activities at each PSAP for the term of this agreement.
- CENTURYLINK will install all software fixes after they have been "Approved for Field Use" (AFU) as they become available.

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- CENTURYLINK will provide (1) system upgrade per year as and if released by Airbus and/or West and the systems will never be more than one (1) version behind the then current software version.
- CENTURYLINK will maintain critical spares in existing crash kits

9.0 TOOLS

9.1 CLEAR VIEW REPORTS FOR NEXT GEN 9-1-1 ROUTING

CENTURYLINK will provide the West Clear View Reports business intelligence reporting tool for metrics reporting, which will supply users with Next Gen 9-1-1 Routing data and reports. The current Master Agreement ALI metrics will apply to this Technical document.

This suite of reports will be accessible through an Internet interface in a standardized HTML format. Users will be able to view summary data for a "big picture" view, and in many cases, drill down to the detail for a more "granular" view. Users can also download the report as a comma-delimited file, which can be imported into Excel or another database application.

West is in the process of evolving its metrics reporting solution. A9-1-1 Routing customers currently access IP selective router (IPSR) and data validation reports through West's web-based ClearView metrics solution. Enhanced reporting for i3 Routing customers will be delivered through a new Enterprise Business Intelligence (BI) tool, Microstrategy® from West. For the Managed Services offering, West will provide the Program and PSAP users with access to all metrics reports through a single web-based interface.

User access to metrics reporting tools is through the West portal. The West portal provides users with secure single sign-on access to multiple web-based applications, including metrics reporting, a web-based data management system, the PSAP management portal to view call detail records and configure routing policies, a ticket system, and a document library for 24x7 access to user's guides and training materials.

9.1.1 Call Data Availability

CENTURYLINK provides support services for the reporting systems on a nine-hour 8:00 A.M. to 5:00 P.M. Mountain Time – five (5) days per week (Monday through Friday) basis, excluding CENTURYLINK holidays ("Normal Business Hours").

9.1.2 Call Data Access

CENTURYLINK will store data relating to Customer performance metrics in a data warehouse. One (1) year of data will be available to Customer via the web site; requests for data older than one year will be handled on a case-by-case basis.

9.1.3 ClearView Metrics

West Clear View Reports provides on-demand access to IP selective router (IPSR) and data validation breakout reports which can be queried based on a daily, weekly, or monthly basis. Clear View Reporting gives users the ability to drill down and capture additional contextual information that can be used to more efficiently manage ongoing 9-1-1 operations. ClearView metrics allows users to Print or Export up to one year's worth of Metrics.

9.1.4 ClearView Location Data Management Reports

Clear View Reports for Location Data Management include:

- Primary Metrics Summary Reports
 - Service Order Processing
 - Daily Error By Number of Records Processed
 - Unresolved Errors at End of Month
 - ALI System Availability
- ALI Records Found
- TN Census Report

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- ALI Retrieval Report
- ANI Failure Report
- System Performance Reports
- NRF Reports
- SOI Reports
- TSS Error Reports

9.1.5 Clear View Reports for IPSR

Clear View Reports for IPSR call processing and call status include:

- Event Count Reports per Hour– provides metrics for total calls in which Customer’s PSAP participated by hour for a day, week or month
- Event Count Report by Trunk Group – provides metrics for total calls in which Customer’s PSAP participated and provides metrics for calls attempted, calls transferred out, calls transferred in
- Event Count by Routing Reason and Destination – Indicates counts where Customer’s PSAP participated as the Primary versus Alternate, whether the call was answered or busy, for Default versus Selective routed, and for call where the destination was “Not Available” (includes abandoned, rejected, transferred and handed-off calls). Provides metrics for total calls, initial calls, calls transferred out, and calls transferred in for each category.
- Event Count by Type – Indicates counts by call type (wireless, wireline, VoIP) where Customer’s PSAP is primary, and provides metrics for total calls, initial calls, calls transferred out, and calls transferred in.
- Event Count by Incoming Trunk – Indicates the number of calls sent to Customer’s PSAP by each trunk, and provides metrics for total calls, initial calls, calls transferred out, and calls transferred in for each category.
- Bridge Call Summary – provides metrics for calls bridged in or out by bridge type (fixed, selective, manual). Call detail is available for each bridged call.
- Routing Database Processing – provides a breakout of initial calls where Customer’s PSAP was Primary by selectively routed versus default routed with a No Record Found (NRF) breakout
- Call Delivery Time – provides statistics on the time to route and deliver calls where your PSAP is Primary, including the minimum, maximum, median and average times. For the Program, this report will include the number of calls above 3 seconds and a percent of total processed

9.2 MICROSTRATEGY® FROM WEST

For Customers with the West A9-1-1 i3 Routing solution, CENTURYLINK and West will provide an i3 compliant logging service as described above. West’s i3 logging service will support retrieval of logs and events via the i3-defined web services interface as well as via a web-based interface.

West’s Enterprise BI Reporting Tool, Microstrategy® from West, will provide a web-based interface to allow the PSAPs and Program to review and retrieve i3 Logging transactions and events including text conversations and data validation metrics.

West will support reports defined in NENA 08-003 v2 Detailed Functional and Interface Specification for the NENA i3 Solution, 20140326 Draft:

- RetrieveLogEvent
- ListEventsByCallId
- ListEventsByIncidentId
- ListCallsByIncidentId
- ListIncidentsByDateRange
- ListIncidentsByLocation
- ListIncidentsByDateAndLocation
- ListCallsByDateRange
- ListAgenciesByCallId
- ListAgenciesByIncidentId

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In addition to i3 defined logs and metrics reports listed above, Microstrategy from West allows users to:

- Define and run ad hoc reports
- Define metrics reports to be run on a scheduled basis
- Provides a flexible interface to query, view and extract 9-1-1 data records

All of the underlying ESInet translation logs are recorded in GMT time. The Microstrategy from West web interface supports time zone conversion for queries and reports with 'Arizona time' as an option.

9.2.1 Call Counts Metrics

Clear View will provide a number of call count breakout reports, which can be queried based on a daily, weekly, or monthly basis.

- Call counts by hour for each trunk group
- Call counts by routing type, where the PSAP queried was the primary destination
- Call counts by routing type, where the PSAP queried was an alternate destination
- Call counts for transfers/bridges where the PSAP queried was the initiator. This query shows transfer/bridge type and destination of the transfer/bridge
- Call counts for transfers/bridges where the PSAP queried was the destination/recipient. This query shows transfer/bridge type and destination of the transfer/bridge
- Call counts by type: wireless, wireline, VoIP
- Call counts for calls which routed to busy; broken down by cause
- Default routed calls by day, week, or month; further broken down by cause. Time and date can also be broken out

9.2.2 Trunk Busy Metrics

Clear View will provide a number of trunk group status reports, listed below which can be queried based on a daily, weekly, or monthly basis and indicate time and duration of each event

- Next Gen 9-1-1 Routing egress (inbound to PSAP) trunk groups busy. Report indicates time and duration of each event
- PSAPs in abandonment state; including time of events and durations. Viewable by day, week, or month
- When Ingress IP and/or IP to the PSAP are introduced, the data captured will not be grouped by trunk group, as the architecture is different. Similar data will be available, but it will not have the same data elements.

9.2.3 Call Detail Metrics

Clear View will provide Call processing and setup information statistics, which can be queried, based on a daily, weekly, or monthly basis and include:

- Call setup times. Clear View provides the minimum, maximum, median, and average call setup times broken out by TG.
- Call duration times. Clear View provides the minimum, maximum, median, and average call duration times
- Bridge/Transfer call setup time. Clear View provides the minimum, maximum, median, and average call bridge/transfer setup calls
- Bridge/Transfer call duration time. Clear View provides the minimum, maximum, median, and average call duration times for bridged/transferred calls
- Calls handed off to a Foreign SR (calls received by Next Gen 9-1-1 Routing but were destined to a foreign SR).

9.2.4 SR Database Results Metrics

Clear View provides a number of SR database results reports by PSAP which can be queried based on a daily, weekly, or monthly basis.

- Number of queries made to the SR database

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- Number of queries which failed due to “No Record Found” (no entry in the SR database for the ANI/pANI transmitted from the End Office)

9.3 CLEAR VIEW REPORT DATA ACCESS AND SECURITY

Clear View Reports current security features are as follows: Users are required to log onto CENTURYLINK secure Internet server using the traditional user id and password authentication and an additional unique and dynamically changing secure access code from their Secure ID token. Each user of Clear View Reports will be issued a Secure ID token unique to that user that will generate a unique access code for use when logging onto the Clear View Reports web site. The access code dynamically changes with each new log on attempt, providing increased data access security.

9.4 METRIC REPORT DEVELOPMENT AND CUSTOMIZATION

Requests for additional or customized reports, query capabilities, and graphical data display should be made in accordance with the Out-of-Scope Request process described in Section 2.2.

9.5 PERFORMANCE METRICS

CENTURYLINK and West will provide overall performance metrics for this Managed NG9-1-1 offering. Program and PSAP users will be able to access all metrics reports through a single web-based interface.

In addition to the IP selective router (IPSR), end to end i3 transaction and event, and data validation breakout reports described above, CENTURYLINK and West will also provide the Program and each PSAP with monthly metrics reports on the following:

9.5.1 Service Performance Metrics

Service Performance Metrics – Monthly performance against all service performance parameters.

9.5.2 Call Delivery Time

Call Delivery Time – Breakout report of call delivery time through the West A9-1-1 Routing or i3 Routing systems including the LPG conversion and Policy Route determination. This report will show the number of calls above 3 seconds and a percent of total processed. The metrics report will not include network latency time.

9.5.3 Network Performance Metrics

Network Performance Metrics – Monthly performance of the CENTURYLINK MPLS network covering:

- Jitter – average
- MOS – low, high, average
- Round trip delay – average
- Packet loss – average
- Downtime – seconds per month per system

9.5.4 Operational Metrics

Operational Metrics – Metrics on trouble tickets opened by CENTURYLINK and West or reported by the Customer through the West portal accessed ticket system, specifically

- Trouble tickets – Number of tickets opened and closed each month
- Trouble tickets – Average time between ticket open and ticket close time. It should be noted that the average ticket close time may not be equivalent to the service resolution time in the case where there were delays in the customer providing additional information needed for West to triage and resolve reported system issues.

9.5.5 Call Processing and System Provisioning Metrics

Call Processing and System Provisioning Metrics – West will provide monthly reports on call processing and system provisioning as described in detail above

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9.6 GIS DATA MANAGEMENT

9.6.1 MapSAG Overview

MapSAG is a GIS data management application used by city or county GIS professionals, outside of the call taking environment, allowing a customer to create and maintain accurate 9-1-1 GIS data and to synchronize the GIS database and the 9-1-1 database. The result is a “checks and balances” approach of consistency and accuracy across databases used for addressing and 9-1-1. MapSAG is installed locally, at the customer location, and operates through a simple interface within Esri’s ArcGIS Desktop product. Various toolbars are available for accessing the available tools and features. The functionality that resides in the ArcGIS Desktop framework remains available while using MapSAG, including editing, drawing, layouts and/or spatial queries. An example of the integration of MapSAG and ArcGIS Desktop is that users can perform a spatial or attribute query and use the resulting records for analysis by the MapSAG tools.

Using MapSAG, ArcGIS Desktop and a combination of both, new GIS data records (streets, structures, polygons etc) can be input into the GIS in a number of ways, including field GPS, on-screen digitizing, import, and auto-generation. The GIS data is stored in an Esri format. The MapSAG software currently operates in the latest version of ArcGIS for Desktop 10 or 10.1 and will utilize a Personal Geodatabase, File Geodatabase or an Enterprise Geodatabase through ArcGIS Server (ArcSDE).

MapSAG software requires a licensed copy of Esri’s ArcGIS for Desktop, to be provided by the customer.

Other GIS data management tools are available and may be used instead of MapSAG. Any alternative product must support Esri standard geo-databases. While the solution includes MapSAG at no additional cost, if PSAP chooses to use an alternative product, all such cost for purchasing, support, and maintenance will be the responsibility of the PSAP.

9.6.2 ESRI Software Requirements

MapSAG requires Esri’s ArcGIS for Desktop.

9.6.3 MapSAG Responsibility Matrix

Task	Responsibility
MapSAG™	
<ul style="list-style-type: none"> - Data configuration - Initial implementation - Training - Software maintenance & enhancements - Technical support 	CENTURYLINK / West
<ul style="list-style-type: none"> - Esri software purchase and maintenance - Basic knowledge of ArcGIS for Desktop - Hardware purchase and maintenance - GIS data creation and updates - Database schema updates - Implementation of optional software patches and upgrades - IT support 	End User

9.6.4 GIS Data Collection

The West experienced 9-1-1 GIS Data Analyst team will provide remote GIS data management assistance to the Customer, including collection of existing GIS data and/or paper maps, GIS data accuracy validation and reporting, and data correction and editing, where applicable. Priority will be placed on gathering GIS layers required to support i3, including Police, Fire, and EMS response

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boundaries, street centerlines, address points, and other data appropriate to support data maintenance procedures.

The solution also offers Mapping and GIS Data Development Professional Services to assist the Agency with map and 9-1-1 GIS database editing and correction in various areas.

9.6.5 MapSAG Training

CENTURYLINK and West will provide training, at customer facility, for its A9-1-1 GIS Data Management software products. Training and a training schedule will be mutually agreed upon by CENTURYLINK, West and Customer. Training will be “train-the-trainer” format, which will enable Customer to train additional employees.

As new versions of MapSAG are made available through the term of the agreement, CENTURYLINK and West will mutually agree upon an updated training schedule for the Customer. Customer is responsible for identifying the training attendees and for training additional personnel, as necessary, or contracting with West to provide additional training.

10.0 ESINET DESIGN

10.1 REFERENCE DRAWING

Please reference file *AZ NG9-1-1 Design (Rev 190921)*

Revision 1 improves on the network design between the legacy selective router to Legacy Network Gateway (LNG) to comply with recent FCC mandated diversity and redundancy order.

10.2 INTERCONNECTING I3 NETWORKS

While technically capable, the Arizona Managed NG9-1-1 solution does not specify nor have cost allowances for interconnection with other i3 Networks. When a PSAP identifies the need for interconnection to other i3 Networks, cost and methods will be determined at that time. However, the below provides the process that would be used to complete the interconnection and how services might work.

West/CENTURYLINK assumes that the entire state of Arizona will first be moved to an IP-based Selective Routing solution. Once implemented, the IP Selective Router solution will support IP enabled (non-i3) PSAPs, legacy PSAPs and i3 PSAPs throughout the state, simultaneously. Since all TN subscriber location information is stored in a common database, which simultaneously supports LIS HELD queries, CIDB Additional Data queries, and legacy ALI queries, the capabilities of the PSAP will determine which interface will be utilized to retrieve location data. If all PSAPs involved in a bridge/transfer have transitioned to i3, they would utilize the Emergency Incident Data Document (EIDD) to 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.

The West/CENTURYLINK ESInet supports interconnectivity with both neighboring i3 and legacy networks. As a transition solution, West/CENTURYLINK will provide a Legacy Selective Router Gateway (LSRG) between the ESInet and the legacy Tandem routers. This makes possible the following services:

Allow i3 PSAPs on the ESInet to receive 9-1-1 calls from the Legacy Selective routers until TSP's have migrated their circuits over to the ESInet.

Allow call transfers with additional information, such as ALI, and depending on CPE, case notes and TTY, between PSAPs still on the legacy tandems and an i3 PSAP on the ESInet.

Allow call transfers between i3 PSAPs on the ESInet and PSAPs on the legacy tandems. Call transfers between i3 PSAPs will support additional information, such as PIDF-LO, and depending on CPE, case notes and TTY.

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West/CENTURYLINK will also support ingress and egress i3 SIP to support both i3-compliant TSP traffic and interconnectivity with other i3 networks, e.g. in-state regional networks or neighboring state networks. Calls received from i3-compliant TSPs and transferred in from neighboring i3 networks will be delivered according to the PSAP-defined routing policy. West's ESRP will also support configuration for transfers to neighboring ESInets via egress i3 SIP.

For Text-to-9-1-1 transfer services, West's TCC now supports a variety of "in-band" commands that can be sent by the PSAP to invoke certain feature-specific actions on TCC such as the transfer function to other PSAPs that are using West for Integrated, Web, or TTY. The transfer functionality also allows the PSAPs involved in a transfer to chat privately when conferencing in the PSAP that the conversation will be transferred to. Upon transfer to another PSAP the entire dialog that had previously taken place will be transferred to the accepting PSAP. Upon transfer the last location known will be forwarded in the initial message to the accepting PSAP.

Note that at the time of this response, there are no industry standardized requirements that have been developed for the transfer of text sessions between PSAPs served by different TCC providers. West has implemented their own solution in order to support transfer capabilities between PSAPs served by the West TCC until such time that standards are developed or an agreement between TCC providers has been reached to support these capabilities.

Text-to-9-1-1 interoperability between TCC providers is supported in the West text solution and has been implemented per J-STD-110.a. Please refer to figure 1, depicting how the reference architecture is extended with multiple TCCs. Figure 1 shows the reference points required to support text routing/delivery and location dereferencing in the scenarios where geography and/or interconnection arrangements require such communication. The extended reference architecture provides the flexibility to invoke those components of the TCC that are needed to support text communications between a given origination and destination point via the desired path. The functional entities within a given TCC that actually get invoked to support text message delivery will depend on where the text comes from, where it is going and what connections and agreements exist to get it from its source to its destination.

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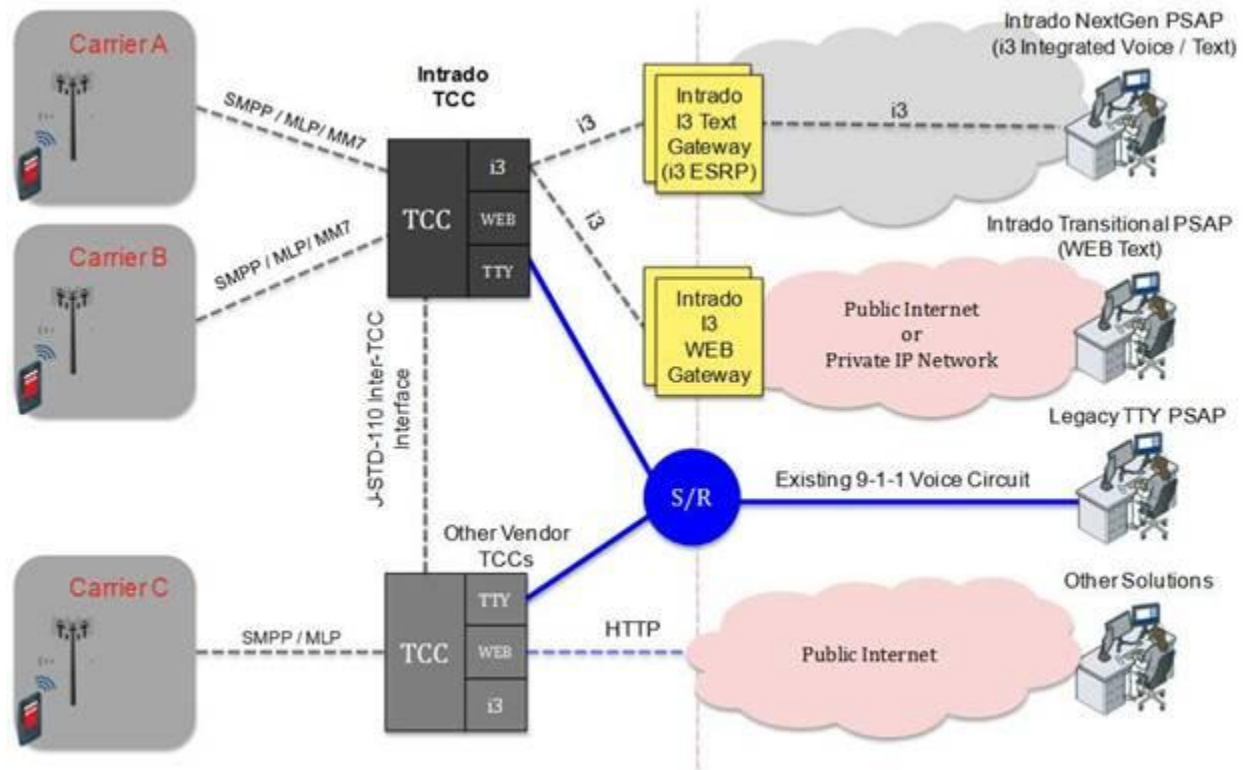


Figure 1 – Text Interoperability

The West i3 solution supports flexible transfer and bridge capabilities for each Customer PSAP as follows:

The West ESRP supports N-way (multiparty) bridging and call transfers using i3 SIP REFER and subscribe/notify messaging. i3 PSAPs can transfer calls to both i3 and non-i3 PSAPs, although N-way bridging is supported only for ESInet call participants.

West's ESRP can also support star code transfers through the Customer PSAP CPE.

West's LNG/ESRP supports the following NENA i3 protocols and interfaces:

- HELD protocol to communicate with the LIS
- Additional Data protocol for the CIDB
- LoST for ECRF communications
- i3 SIP

Physical points of interconnect for the ingress network, West will partner with CENTURYLINK to ensure all carriers connect to the West LNG.

10.3 LEGACY NETWORK GATEWAY (LNG)

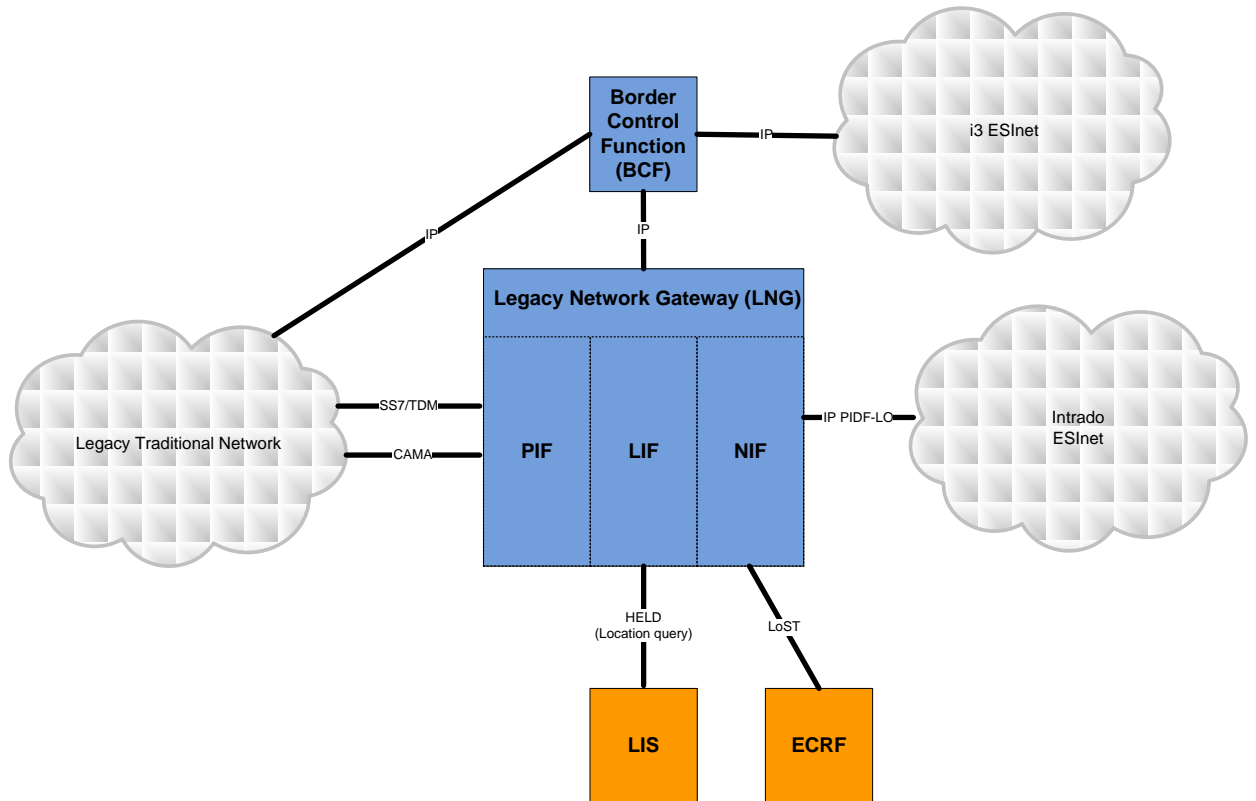
The Legacy Network Gateway (LNG) and Legacy Selective Router Gateway (LSRG) are signaling and media interconnection points between callers in the legacy originating networks and the i3 architecture. The LNG provides the NENA i3 specified NG9-1-1 specific Interwork Function (NIF), Protocol Interworking Function (PIF) and Location Interwork Function (LIF).

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The CENTURYLINK and West LNG function will interface the legacy 9-1-1 network to the West ESInet. The LNG will convert CAMA and TDM/SS7 calls to IP within the Protocol Interwork Function (PIF) to support any 9-1-1 call received from the legacy network that is not IP based.

The LIF utilizes a key from the incoming signaling to retrieve location information from the Location Information Server (LIS) using the HELD protocol. The LIF also retrieves Additional Data associated with the call from the Call Information Database (CIDB) using the "Additional Data" protocol as specified by NENA. The location and additional call information is provided to the NIF to be passed to the ESRP for use in determining the route and populating the SIP messaging to the PSAP. The NIF will generate the SIP PIDF-LO (Presence Information Data Format-Location Object). PIDF-LO is a SIP message that has location information embedded in an XML format within the SIP invite.



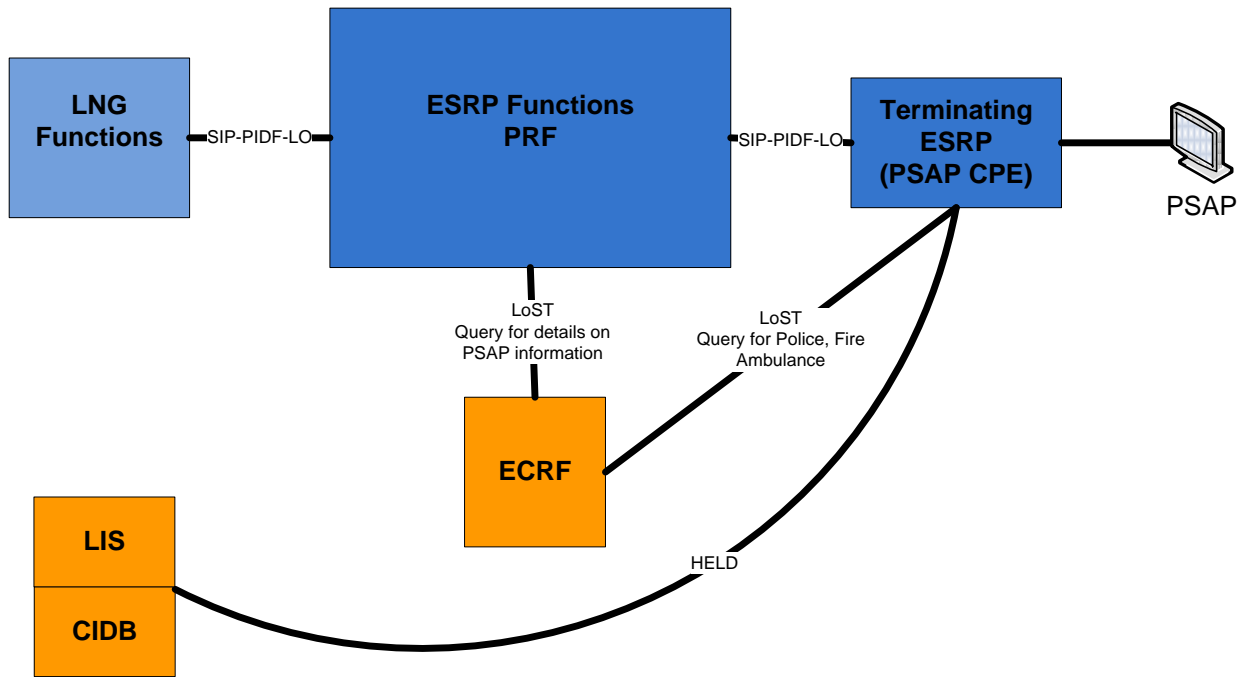
LNG Function

When the ESRP (Emergency Service Routing Proxy) receives the PIDF-LO message, the ESRP may query the appropriate ECRF to determine the next hop for the 9-1-1 call. The West ESRP contains the routing logic that routes the call to the appropriate terminating ESRP, also known as the PSAP's hosted VIPER or VESTA call handling system. The hosted call handling solution will function as the terminating ESRP and will have the ability to query the CIDB, LIS, and ECRF to accurately represent the call's information and associated jurisdictional information on the workstation. This includes the ability for the call handling system to query the ECRF to obtain specific information about which Police, Fire, and EMS

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supports the caller location, based on the GIS information received within the PIDF-LO message. These functions will be part of the hosted call handling service.



10.4 LEGACY NETWORK GATEWAY – ARIZONA SPECIFIC

As customer PSAPs migrate to an ESInet solution, there will continue to be the need for these NG9-1-1 enabled PSAPs to receive wireless and wireline calls from legacy TDM networks and from legacy PSAPs. In compliance with the NENA i3 defined solution for interconnecting legacy networks and the Emergency Services Information Network (ESInet), CENTURYLINK will deploy two Legacy Network Gateways (LNG)s in Arizona at the following data centers:

**INVOLTA DATA CENTER
IO DATA CENTER**

At each LNG, CENTURYLINK will install Gateways where calls originating on the legacy network will be converted to IP for transport over the ESInet to the West Emergency Call Management Center and then on to the i3 enabled, or NG PSAP.

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 the number of ES and LSR transfer trunks up or down, as needed.

CENTURYLINK ES trunks are configured in a Primary / Secondary overflow pattern (never load shared). In the solution for Arizona, half the ES trunks from the LSR are honed to one of two LNGs, while the other half is honed to the second LNG. In the event that a LNG is lost, an Arizona NG PSAP will still maintain

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full service levels similar to how all Arizona PSAPs are currently provisioned with N+1 redundancy through dual tandems.

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 ES trunks to the LNG and then over the ESInet to a NG PSAP. Call setup times are dramatically improved when processed through the LNG to the IPSR with an average call setup time of 600ms.

10.4.1 Independent CSPs

Independent CSPs legacy selective routers (LSR) can be honed to the LNG. Per customer request, the LNG design provides the interface for other service providers, such as Frontier, to enter the Arizona ESInet. The originating call can be from a legacy network or IP enabled network.

West and CENTURYLINK encourage the direct connection of CSPs to the LNGs; however, this is not in scope of this project. Timing can depend on the Carriers, and on factors not under West or CENTURYLINK's control.

CENTURYLINK acknowledges the customer's desire to allow wireless CSPs to direct connect during Phase One of the project. Allowing CSPs to direct connect during Phase One implementation brings on new project risks and will take additional planning and coordination to accomplish. This would include, but not be limited to:

- Negotiation of Interconnect agreements
- Determining costs for interconnection
- Solution Design
- Solution Implementation
- Solution Testing

CENTURYLINK and customer will evaluate any requests for direct wireless CSP connection after the first successful Phase One PSAP migration. In this evaluation, CENTURYLINK and customer will determine project risks from the extra efforts required for wireless CSP interconnection.

If both parties agree that the inclusion of direct wireless CSP interconnection to the i3 network poses low risk to a successful Phase One deployment, then such interconnection will be allowed. If, at any time after including wireless CSP interconnection, it is determined that successful deployment of Phase One is in jeopardy, CENTURYLINK may delay wireless CSP interconnection at its discretion.

If it is determined that inclusion of direct wireless CSP interconnection to the i3 network poses to high of a risk to include in Phase One deployment, CENTURYLINK and customer can complete all planning required during Phase One deployment so that implementation of direct wireless CSP interconnection to the i3 network can commence at an agreed date following Phase One deployment.

10.4.2 Proper Gateways for Service Providers

West supports ESInet ingress IP traffic via the NENA i3 and ATIS-0700015 "Standard for Implementation of 3GPP Common IMS Emergency Procedures for IMS Origination and ESInet/Legacy Selective Router Termination, August 2013". The IP Point of Interconnect (POI) supporting Session Internet Protocol (SIP) call delivery is the West Border Control Function (BCF) at each of the geographically diverse Emergency Call Management Complex (ECMC) locations. The SIP interface can be used for carriers delivering i3 compliant interface with PIDF-LO or ESInet to ESInet call hand-offs and transfers.

Additionally, the SIP Ingress protocol can be used to support a transition strategy where IP protocols are used to replace TDM protocols as a means to providing better connectivity with redundant path routing and a transition from legacy to NG9-1-1 interfaces.

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The process for migrating carrier traffic from the gateways to the SIP POIs is defined in detail and will be reviewed with the carrier when the migration process is initiated. A summary of the overall process to be led by an West Project Manager (PM) is provided below:

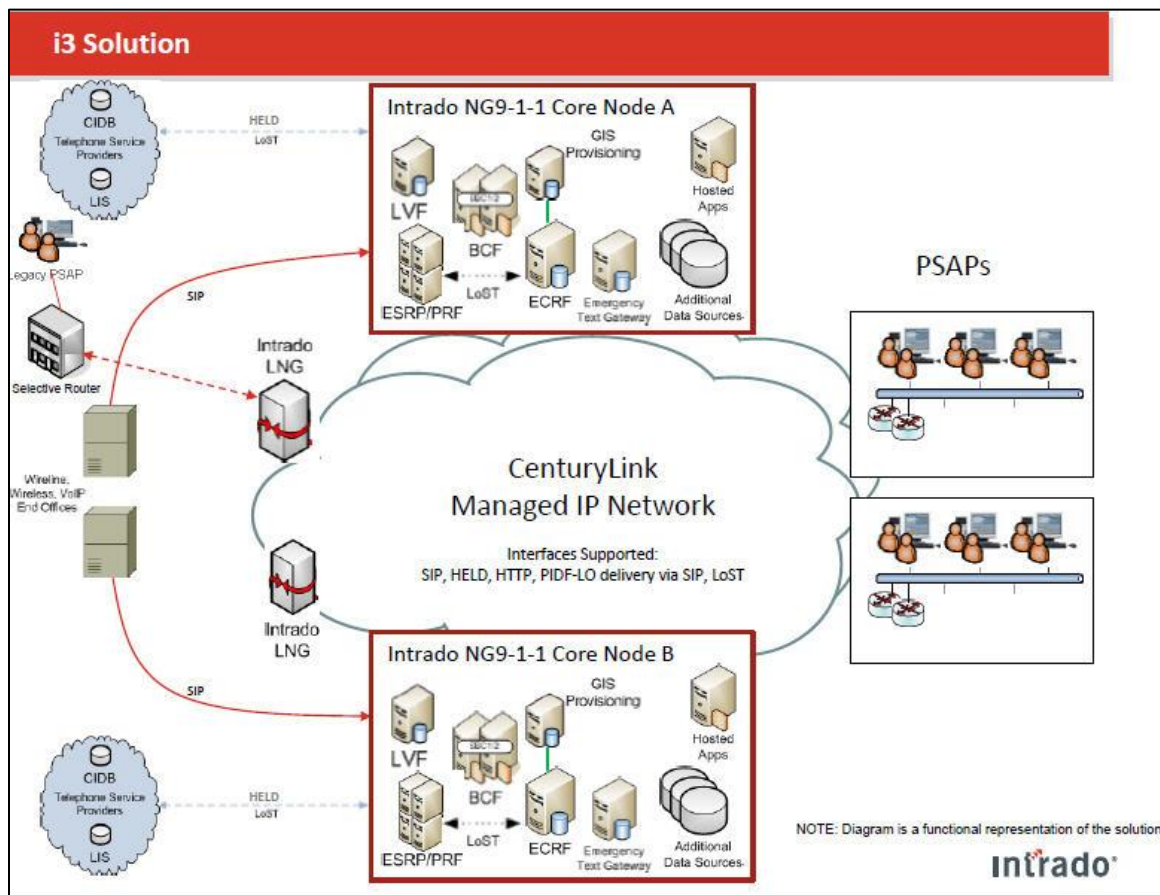
- PM communicates the timeframes, dependencies and requirements for migration
- PM provides SIP interconnection specifications, industry standards and online ordering guidelines
- PM provides plans including schedules, milestones and deliverables and works with the carrier to establish capacity requirements, interconnection steps, etc.
- Connections are ordered by the carrier and established and tested with West
- Upon successful completion of interconnection of carrier SIP virtual trunk groups from the gateway, the TDM trunk groups are disconnected

10.5 EMERGENCY COMMUNICATIONS MANAGEMENT CENTER

The West Emergency Communications Management Center (ECMC) contains the systems required to support the NG 9-1-1 network for Arizona including the IP Selective Router (IPSR) and i3 functional components, including text gateways, and hosted applications. For the Arizona solution, the ECMC will also host the geo-diverse NG9-1-1 enabled VIPER system. There are two geo diverse ECMCs in the CENTURYLINK solution with one NG9-1-1 core node in Englewood CO and a second NG9-1-1 core node in Miami FL.

10.6 i3 FUNCTIONAL COMPONENTS

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.



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Figure 10.1 Functional Components of i3 Solution

10.6.1 Emergency Call Routing Function (ECRF) and Location Validation Function (LVF)

The ECRF provides full i3 compliancy housing Customer provided street centerline and point data, multiple geospatial routing boundary layers and utilization of the LoST (RFC 5222 compliant) interface for retrieval of police, fire, emergency medical services and other applicable service types.

Interface with the ECRF is via an i3-based LoST protocol interface. The Emergency Services Routing Proxy (ESRP) queries the ECRF via the LoST protocol to obtain the destination Uniform Resource Identifier (URI) for the call. Using the destination URI, the ESRP interfaces with the policy store to identify applicable routing policies. For geospatial routing policies other than Standard Routing or a Priority Override policy, the ESRP re-queries the ECRF via LoST to obtain the routing destination for alternate service types – e.g. abandonment, diversion requested or special event routing.

The ECRF supports multiple Geographic Information Systems (GIS) and service type layers which are leveraged to support geospatial queries via the LoST protocol. In addition to street centerline and point data provisioned via the GIS provisioning platform and SIF systems, the ECRF supports provisioning of multiple service types including:

- **Standard Routing** – The standard i3 routing boundary for each PSAP and the corresponding URI are pre-provisioned via the SIF and retrieved by the ESRP for use in determining the applicable routing policy.
- **Abandonment, Overflow, Diversion, and Special Event Routing** – In addition to standard i3 routing, the ECRF allows geospatial boundaries to be provisioned for multiple routing service types to support abandonment, overflow, diversion, and special event routing policies. Each assigned a unique URN. Provisioning via the ECRF ensures that alternate policy routing is based on fully-validated GIS boundaries. Once provisioned, configuration changes made via the Policy Routing Function (PRF) User Interface can specify an alternate URN to be used for routing determination. Note that these capabilities are in addition to use of a Priority Override Polygon which would be provisioned directly to the PRF and for locations that fall within its boundary, would be used in place of an ECRF query to route calls.
- **Emergency and Additional Services** – The ECRF supports provisioning of separate boundary layers for first responder service types including police, fire and emergency medical services and additional find service types such as poison control, animal control, etc.

The ECRFs exist within a highly available and geographically distributed application processing environment. A single hardware component failure at one of the data centers will not interrupt processing of the ECRF. A single data center failure will not prevent further call processing from occurring. High availability is achieved through high availability software design, redundant ECRF instances, and transactions using dynamic client/server connections with multiple ECRF serving entities. It is expected and recommended that a single statewide ECRF configuration will be implemented, with the ECRF containing coalesced data from all participating entities within the state. The ECRF can optionally be implemented in a hierarchical configuration where regional ECRFs recurse to a statewide ECRF to retrieve a response from another regional ECRF serving a different region.

Where possible, static locations provisioned to the Location Information Server (LIS) will not only contain a location validated civic element, but also the supplied or derived latitude and longitude associated with the civic address. The West geocoding platform utilizes the same GIS Customer data source as the ECRF and LVF (Location Validation Function) and is also provisioned via the SIF. The West geocoding platform supplies the geodetic element (latitude and longitude) to be provisioned to the LIS along with the validated civic element.

Where point GIS data is provided by the Customer, latitude and longitude will be directly utilized via the attributes provided. When point GIS data is not available, but street centerlines are provided, the

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latitude/longitude will be interpolated using industry standard geocoding technologies, and the resulting latitude/longitude will be associated with the LIS record. The ESRP will send the latitude and longitude as the preferred location element to the ECRF to determine the appropriate PSAP for routing. The ECRF utilizes this latitude/longitude to perform a point-in-polygon lookup to return the appropriate URI for the PSAP associated with the polygon the latitude and longitude falls within. When geodetic location elements are unavailable, routing and other services can also be determined based on the validated civic address element.

The GIS data layer(s) that are used to identify the PSAP, emergency, and additional service types are configured on a per-service basis, e.g. urn:service:sos. If a LoST query contains the geodetic location and a routing Uniform Resource Name (URN), the geodetic location will be used to directly query the PSAP boundary layer and identify the target PSAP. The GIS polygon set that is queried is based on the service URN of the query.

The ECRF supports provisioning of separate boundary layers for first responder service types for police, fire and emergency medical services, as well as optional service types, such as poison control, as long as the polygon datasets are provided with the GIS data. The i3 compliant PSAP may query the ECRF for additional service URNs associated with the location or to identify the URI of an Additional Location Data Repository (ALDR) if one is provisioned for the specific civic location. For each service URN the Customer would like to support, polygon sets must be included for SIF validation and implementation into the ECRF.

Customer GIS updates are provisioned through the West Spatial Information Function (SIF) which performs GIS validations, including those that ensure routing integrity. The West SIF's unique field mapping capabilities allow data to be presented by different Customers using unique schemas, provided all mandatory data elements are included. Validated GIS updates are normalized and applied to the ECRF production instances in a manner that preserves availability and coordinates with other ESNet scheduled updates and activities. The SIF can accept data from GIS data sources as often as the Customer's data update workflow requires. Once the data is received by the SIF, the ECRF will be updated within three (3) hours. A change control model is implemented to track changes between the GIS provisioning platform and the production ECRF instances. Extensive QA/QC validations are performed within the SIF process to eliminate the provisioning of erroneous data to the ECRF. If it is necessary to revert to a previous version of the data, West's SIF can re-provision the ECRF with a previous version of the customer provided data at the customer's request. West stores the past copies of the GIS data for 6 months in the production system. The re-provisioning time frame would depend on the amount/size of the data, and would be on the order of the time frame for the original update to occur. Typically 3 hours as indicated above.

The Quality Assurance/Quality Control (QA/QC) processes provided during validation steps in the SIF will prevent any unwanted gaps or overlaps being provisioned in the ECRF. As an added value and per NENA i3 guidelines for ECRF gap and overlap handling, if any boundary gaps exist, the ECRF handles them by selecting the nearest boundary, as long as the boundary is within a configurable threshold distance from the location. For boundary overlaps, the ECRF assumes both are valid and, since only one URI can be returned per the NENA guidelines, picks a single URI to include in the response. NENA specified Gap/Overlap event notifications for Gaps/Overlaps exceeding a configurable threshold are provided at configurable intervals to the GIS data providers.

West's 9-1-1 Enterprise Geospatial Database Management System (EGDMS) services are optionally available, at no additional fee, to assist multiple agencies to collaborate and resolve boundary conflicts when GIS data from these multiple sources are coalesced.

The CENTURYLINK solution includes an Emergency Call Routing Function (ECRF) and a Location Validation Function. As the PSAPs transition from a Tabular MSAG and ESN based routing to GIS based routing, the required ECRF and LVF elements will be available.

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10.6.2 Location Validation Function

The Location Validation Function (LVF) provided will be physically separate from the Emergency Call Routing Function (ECRF). The LVF and ECRF are populated from the same GIS (Geographic Information System) sources and no unique GIS data requirements exist for either function.

Location to Service Translation (LoST) servers, specifically dedicated for LVF functions, will be implemented independently of the ECRF for authorized carrier access to the validation functions. This architecture ensures that potentially high-volume validation functions never interfere with the ECRF functions of emergency call routing and determination of first responders for a given location.

As with the ECRF, the LVF will utilize the Customer's GIS data provisioned via the SIF and will determine whether or not the civic address provided in the LoST request is valid. The LVF responds per the NENA i3 standard (NENA 08-003) and the specified Internet Engineering Task Force (IETF) standards (RFC5222).

To complement the LoST protocol interface into the LVF, a map-based graphical user interface (GUI) will be available to authorized users. This interface, accessible via a secure web interface, is designed to facilitate the finding of LVF-valid civic addresses for CSPs otherwise unable to validate a location via the LVF using the LoST protocol interface.

The LVF is deployed in a fully-redundant, highly available (99.9%) environment to ensure immediate responses to the LVF LoST queries. It is critical to note: the solution component services, which are utilized during live 9-1-1 call processing and which could include an "LVF LoST Query" during call time will be designed for 99.999% availability. Our LVF component (LVF with Locology, which is the provisioning interface) is designed to meet/exceed 99.9% availability. This is in concert with the direction from NENA i3 standard and the ongoing working group. The attached NENA document discusses the differentiation in Section 3.4 on Page 23 and provides guidelines for availability. Generally Five 9s for runtime systems and network components and two to three 9s for other functional elements. Clients must access the LVF via secure protocols; Secure Sockets Layer (SSL) versions 2 and 3 and Transport Layer Security (TLS) versions 1, 1.1, and 1.2 are all supported.

Mutual authentication will also be employed, so it is expected that both the client and LVF will be configured with valid digital certificates issued by their designated PSAP Credentialing Agency (PCA). At the time of West's response, a PCA does not exist. Without a PCA, credentials will be issued by a trusted credentialing entity.

The LVF is in a secure network using an Intelligent DNS infrastructure to provide a high level of performance, availability and security. Behind the Intelligent DNS infrastructure, additional state-of-the-art network elements provide high security against even the most aggressive malicious network attacks. All fixed location (wireline) telephone number (TN) records must be validated against the Customer's GIS data prior to being loaded into the Location Information Server (LIS) and Automatic Location Identification (ALI) systems. The database management system used to process and validate Service Order Input (SOI) from communications service providers (CSPs) maintains a copy of the validated record and the data used for SOI validation is sourced from the Customer's GIS data. Anytime the underlying GIS data is updated, the database management system searches for any TN records that may be impacted by the change. For those affected, it then immediately revalidates the record and either updates the LIS and ALI or flags it as an error for the Data Integrity Unit (DIU) analyst, who will work with the carrier and/or the Customer's designated coordinator(s) to resolve. During the transitional phase toward a full i3 model, this process bypasses the need for periodic (e.g., every 30 days) LIS record revalidations and ensures the LIS/ALI records are kept as current as possible.

For authorized CSPs who have chosen to provide their own LIS, the LVF is also available to validate their subscriber's location information prior to provisioning, as well as for periodic revalidation as needed. Please note that this LoST server instance will always be separate from the ESInet ECRF instance involved in 9-1-1 call routing.

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Depending on the capabilities of the PSAP CPE to utilize locally available GIS data (i.e. data provisioned for the ALI mapping display), when a 9-1-1 call involves a reporting party that is not located at the site of the emergency, the LVF LoST server and complimentary map-based GUI will be available to the call taker to determine the valid address provided by the caller.

10.6.3 Border Control Function

The CENTURYLINK solution will include Border Control Function with Firewalls (FW) and Session Border Controllers (SBC). The FW and SBC provide the required Border Control functions (BCF) for security and provide the means for prevention, detection, and reaction to security events to ensure reliable 9-1-1 call delivery. The BCF sits between external networks and the ESInet and all traffic transiting between these networks must flow through the BCF.

The solution provides all the required NENA specifications for an ESInet BCF including:

- Application layer scanning and protection
- Network layer scanning and protection
- Denial of Service (DoS) detection and protection
- Malware detection and protection
- Identification of emergency call sessions and priority handling of IP traffic
- Facilitate forwarding of emergency calls
- Protection against Distributed Denial of Service Attacks (DDoS)
- SIP Protocol Normalization
- Network Address Translation (NAT)
- Quality of Service (QoS) markings

10.6.4 Emergency Service Routing Proxy (ESRP) and Policy Routing Function (PRF)

The Emergency Service Routing Proxy (ESRP) delivers NENA i3 defined routing functionality, including full integration with geographically determined routing policies, carrier-grade voice quality, and demonstrated reliability. The ESRP interfaces with the Location Information Service (LIS), the Emergency Call Routing Function (ECRF) and the Policy Routing Function (PRF) to identify and route the voice call to an available PSAP (Terminating ESRP). West's i3 Routing solution supports queue management and provides PSAPs with control over managing their routing policies from a flexible array of options.

10.6.5 ESRP Overview and Interface Compliance

The ESRP processes ingress calls received using Session Initiation Protocol (SIP) signaling with location embedded in the Presence Information Data Format – Location Object (PIDF-LO) from i3-compliant carrier networks, from legacy carriers or from selective routers via the Legacy Selective Router Gateway (LSRG) and routes calls to the call processing system (CPS) and then on to the PSAP location, according to the caller's location and the PSAP-configured routing policy.

When the ESRP receives an ingress call, it evaluates the SIP INVITE geolocation header within the PIDF-LO. If the geolocation header contains location by reference, the ESRP queries the Location Information Server (LIS) via the HELD interface to dereference the location and obtain a routable geodetic or civic location value. The ESRP then queries the Emergency Call Routing Function (ECRF) via the Lost to Service Translation (LoST) protocol with the caller's geodetic or civic address location to identify the call's destination Uniform Resource Identifier (URI).

Using the location-determined URI retrieved from the ECRF via the LoST protocol, the ESRP interacts with the Policy Routing Function (PRF) to determine call routing. Policy route determination includes evaluation of the PSAP-configured routing policy, the time-of-day, the caller's location (for geospatially-determined alternate routing policies), the PSAP's operational state, and the ring-no-answer timer configuration. Emergency override policies supersede pre-provisioned policies when the call falls within the PSAP-defined routing polygon. This solution enables PSAPs to quickly implement emergency routing policies during emergent events that require calls to be sent to supporting agencies.

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West provides and maintains the following i3 interfacing specifications for providers and vendors of interfacing components. Each specification details the RFCs supported and interface implementation details:

- CIDB-Additional Data Interface for A9-1-1
- LIS-HELD Interface for A9-1-1
- ECRF-LoST Interface for A9-1-1
- ESRP Terminating Interface for A9-1-1

West has been actively testing i3 interoperability with all leading i3 CPE (Terminating ESRP) providers and discussed implementation on interface details to develop or to identify as roadmap items until the standards have stabilized. The NENA i3 interface standard is continuously evolving as NENA works to gain consensus on Version 2 of the standard. West is actively engaged in NENA and IETF standards committees to provide recommendations and feedback on standards evolution.

10.6.6 Policy Routing Function (PRF)

West's Policy Routing Function (PRF) supports queue management and provides PSAPs with extensive flexibility to define and update standard and alternate routing policies. PSAPs can dynamically modify routing policies, submit routing polygons, set priorities, and modify their queue (operational) state. Routing policies can be defined as recurring or one-time, and priority override polygons can be submitted on-the-fly for emergency re-routing.

West's i3 rules-based routing proxy includes the following elements:

- **Policy Store:** Acts as a repository of PSAP-defined routing policies and policies based on ingress call path or call type.
- **Browser Interface:** Provides a feature-rich management portal that allows PSAPs to customize Emergency Services Routing Proxy (ESRP) configurations, define and edit their routing policies, and modify their status (normal, abandoned, diverted). All routing policy changes are automatically verified for syntactical and logical accuracy prior to activation in production. Secure user access is provided via the provided web management portal.
- **ESRP Retrieval and Routing:** Performed based on PSAP-defined routing policies.

The policy store supports the following types of routing policies:

- **Abandonment Routing:** The abandonment policy is engaged whenever the PSAP operational state is defined as "Disabled."
- **Overflow Routing:** The overflow routing policy is applied during overflow scenarios when a PSAP is receiving more calls than its occupied work stations can accommodate. Upon reaching the designated call capacity for the call type, cumulative calls, or if the target is unreachable, the ESRP engages the primary PSAP's overflow routing policy. The alternate routing policy will be invoked if the terminating ESRP's call processing system does not accept the SIP INVITE or for a ring-no-answer timeout.
- **Diversion Routing:** The diversion routing policy is applied whenever the PSAP engages alternate diversion routing rules, or it can be configured to apply during a recurring time window. The PSAP operational state may be modified to engage the diversion routing policy by contacting the CENTURYLINK 9-1-1 NOC, or modified via the provided web management portal.
- **Special Event Routing:** Special event routing is a diversion routing policy that is applied during a scheduled time window. If a PSAP jurisdiction contains venues that host events (e.g., concerts, sporting events, etc.) that may warrant dedicated call handling (alternate locations or dedicated resources at the PSAP), special event polygons can be pre-provisioned via the ESInet Spatial Information Function (SIF), submitted via the provided web management portal.
- **Priority Override:** During an emergency scenario when call routing needs to be redrawn on-the-fly without the rigor of full Geographic Information System (GIS) validations, the ESInet allows PSAPs to enter and/or import routing polygons via the i3 policy editor. Priority override polygons can be defined as point and radius or as defined polygon boundaries.

West provides a feature-rich policy editor, accessible via the provided web management portal, for PSAPs to customize and maintain their policies, whether textual or geospatial. Geospatial policies can

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reference shapes pre-provisioned in the Emergency Call Routing Function (ECRF) or can reference a shape attached to the policy. A shape attached to the policy can either be a shape file or a description of a shape (points and, optionally, distances). An example would be a latitude, longitude and a radius to describe a circle or multiple latitude and longitude points to describe a polygon. Policies also have other attributes like active/inactive; one-time or recurring time window; priority; Uniform Resource Identifier (URI) or a set of URIs of the destination(s) to send the call to; and call distribution method, to name a few. These policies can be pre-provisioned or can be constructed in real time based on the incident.

The ESInet supports a SIF interface for provisioning of geospatial routing policies into the ECRF. Geospatial routing policies are applied to the ECRF after all GIS and routing validations have been completed.

Abandonment, Overflow, and Diversion Routing policies can be configured to use any of the following policies:

- **Geographical:** The system can be configured to send abandonment calls to different alternate PSAPs based on the geographic location of the calling party within the primary PSAP's jurisdiction. Geographic abandonment or alternate routing polygons can be pre-provisioned via the SIF or submitted dynamically.
- **Hierarchical:** The system can be configured to cascade a call to up to nine consecutive alternate PSAPs.
- **Load-balanced:** The system can be configured to distribute calls between up to nine alternate PSAPs.

10.6.7 Event Logging Service

For Customers with the West A9-1-1 i3 Routing solution, West will provide an i3 compliant logging service which aggregates logs from West ESInet, i3 compliant Terminating ESRPs (CPE) components to support end to end transaction logging and retrieval.

The West i3 logging service includes a web service that supports logging and event retrievals. All significant steps in processing a call are logged and submitted to the ESInet logging service, and each log contains a transaction ID to support log aggregation. The i3 logging service is compliant with the i3 specification for recording transaction metadata for all payloads to provide end-to-end reports.

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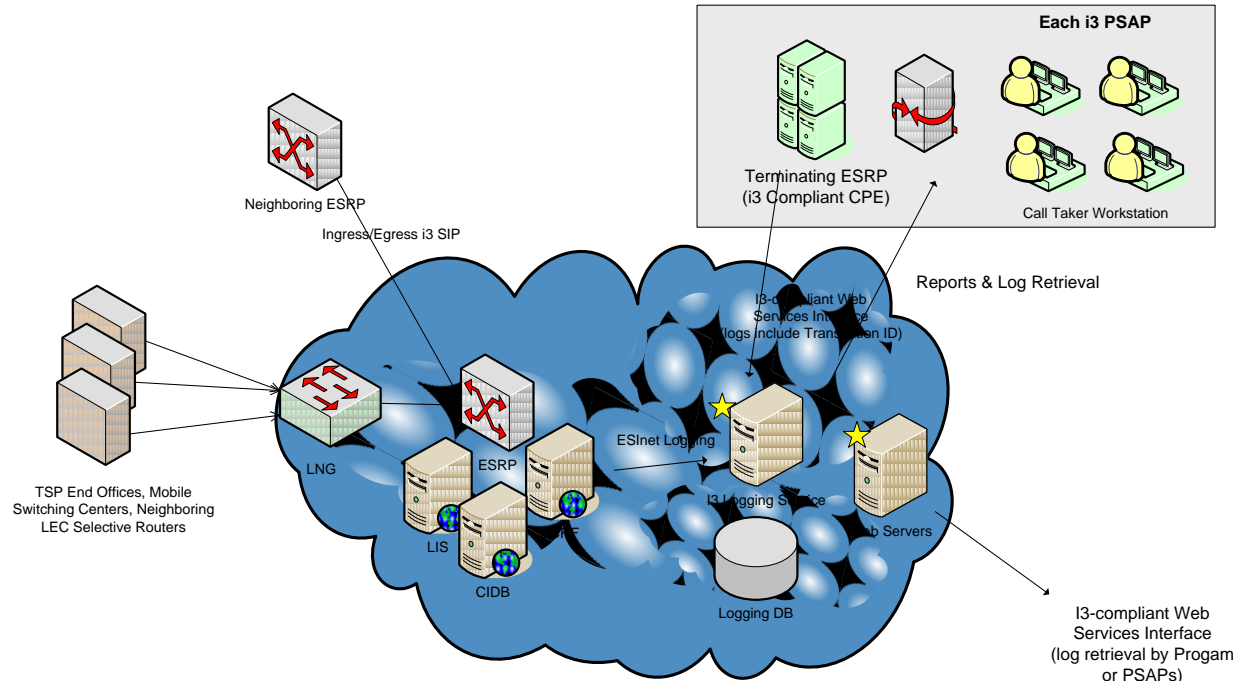


Figure 2 – West i3 Logging Service

West’s Enterprise BI Reporting Tool, Microstrategy® from West, will provide a web-based interface to allow the PSAPs and Program to review and retrieve i3 Logging transactions and events including text conversations and data validation metrics. West will support retrieval of logs and events via the web interface and the web services interface including the following retrieval options defined in NENA 08-003 v2 Detailed Functional and Interface Specification for the NENA i3 Solution, 20140326 Draft:

- RetrieveLogEvent
- ListEventsByCallId
- ListEventsByIncidentId
- ListCallsByIncidentId
- ListIncidentsByDateRange
- ListIncidentsByLocation
- ListIncidentsByDateAndLocation
- ListCallsByDateRange
- ListAgenciesByCallId
- ListAgenciesByIncidentId

As the NENA XML Schema Definitions for logging are in the process of being finalized at the time of this response, the i3 logging service, web interface, web services interface and associated reports are currently under development with an anticipated release date of Q2- 2015.

10.6.8 Forest Guide

Please note that NENA has provided clarifications that state what in the past has been referred to by some as a “statewide Forest Guide,” should be referred to as a “statewide ECRF.” The NENA vision is for these statewide ECRFs to utilize an iterative request to a national Forest Guide to determine the correct statewide (or otherwise) ECRF that is authoritative for the location element(s) provided in the original LoST request.

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The RFC 5222 compliant West ECRF has the capability of serving a regional ESInet as well as providing ECRF functions in support of an entire state, provisioned with GIS data for all i3 capable regions within the state. It is also capable of working in a hierarchical fashion as either the state level or regional ECRF. In this configuration, the parent (state) ECRF knows the coverage areas of all child ECRFs within the state, with the capability of performing recursive queries to child ECRFs and returning the LoST responses to the requesting child ECRF, assuming data exists for the region in question. While no National Forest Guide is in existence for the United States, the West ECRF has the capability of serving that capacity, given access to coverage areas and URIs for other existing ECRFs within the country.

The ECRF provides full i3 compliancy housing street centerline and point data, multiple geospatial routing boundary layers and utilization of the LoST (RFC 5222) interface for retrieval of policy, fire, emergency medical services and other applicable service types.

11.0 I3 MIGRATION PROCESS

West/CENTURYLINK will design the network connectivity to support the A9-1-1 Routing, A9-1-1 Location Data Management and TXT29-1-1 data solutions for the Customer. The design will conform to industry best practices and West security policies. West/CENTURYLINK requires geographic diversity, redundancy, and diverse connections to the PSAPs it services for ALI, and A9-1-1 Routing services. Likewise, West/CENTURYLINK requires geographically diverse and fully redundant and diverse connections from telephone service providers to at least two West demarcation points into the ESInet.

West prepares the 9-1-1 database management system by loading in the MSAG as provided by the customer. Simultaneously, West works with the telephone service providers to assist them in the preparation for the ALI transition. This involves the facilitation of Telephone Number (TN) simulations and resulting error corrections with the TSPs to ensure that the TN error rates meet/exceed the desired threshold (as agreed by the PSAP) before final load and ALI flash-cut.

Once ALI transition has completed, the transition of end offices to the 9-1-1 Routing solution begins. As each telephone services provider's end offices are connected to the West network, West will work with the TSP to conduct pre-cut test calls to ensure accuracy of translations before cutting the live traffic from the end office to the 9-1-1 Routing solution.

11.1 DEVELOPMENT LIFECYCLE

West's approach to plan, configure, network engineer, implement, test, document, train, and support West Service follows West's solution lifecycle methodology. The lifecycle begins with solution definition and architecture activities. During these initial phases, the joint West team and Customer team members verify system application and implementation requirements, refine the solution architecture, and finalize the plan for solution migration and deployment. Following definition and architecture phases, the team orders, installs, configures, tests, and trains users on customer-facing solution components as part of solution integration and deployment effort. Following successful deployment, the maintenance phase begins. The primary goal of the lifecycle methodology is that the project aligns with overall customer expectations, and is tailored to fit the needs of the Customer. The Project Plan phases are described below.



Figure 12 Project Plan Phases

11.2 SOLUTION DEFINITION

The first phase in the solution lifecycle is the Solution Definition phase, which begins with the kickoff and alignment process and is critical to the overall success of the 9-1-1 initiative within the state. During this process, key members of the joint project team unite to identify roles, responsibilities, critical success factors, project challenges, elaborate on specific strategies and project options, confirm Next Gen 9-1-1 project scope, and finalize plans to expedite solution delivery plans and resources. The solution is reviewed in order to align each primary stakeholder with a common vision and strategy for unified team design and planning.

The West team conducts current systems, processes, and site studies to more clearly understand the current system and user environment, allowing the team to plan the most effective migration path to the new system.

11.3 SOLUTION ARCHITECTURE

During the Solution Architecture phase, the detailed solution design is finalized based on confirmed requirements. During this phase, the team analyzes the current systems, operations, and operational procedures, identifies the human factors needs, considers implementation options, and with the Customer, commits the detailed solution design and implementation schedule.

Stakeholder participation to identify processes and standard operating impact is critical in this process to support a successful integration of the new system. It is vital that current procedures, connectivity, and routing policies are examined so that the appropriate practices are carried forward to the new system environment. Examples of important areas considered include load balancing, alternate, backup, and default routing rules.

Initial planning for connectivity from the existing legacy selective router and telephone service providers to the Legacy Network Gateways (LNGs) also begins in the architecture phase. The recommended migration strategy uses the legacy selective router during the migration period to aggregate and handoff traffic by ESN to support flash cuts by PSAP and then rehome end offices and MSCs post PSAP conversion. Key solution architecture planning activities include:

- Detailed solution design and schematics (onsite, site to site, site to West, firewalls, routers, etc.)
- IP specifications
- Telephone service provider connectivity specifications
- Physical requirements (e.g., equipment room design, floor loading)
- Call transfer requirements
- Training plan and schedule

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- Refined project plan and timeline

11.4 SOLUTION INTEGRATION

During the Solution Integration phase, the components of the solution, including processes, applications, network components, and data flow, are engineered and readied for deployment. All network, regional, and premise components are delivered, and the equipment rooms and other facilities are readied. Coordination with wireline, wireless, and VoIP telephone service providers is an essential part of this stage to plan for the 9-1-1 services management transition. Telephone service providers receive all necessary information and detail to obtain connectivity to the West systems and the service provider's connectivity to the LNGs is engineered and ordered.

Working closely with the Customer and stakeholder groups, the project team designs customized provisioning plans (including incoming trunk route plans, bridge lists, and dialing plans). Additionally, the documentation and training developers customize the user and process documents and various training courseware, if needed, to meet the needs of the Customer.

11.5 SOLUTION DEPLOYMENT

During the Solution Deployment phase, all network components and equipment connectivity is confirmed. Validation and acceptance tests are performed, metrics tracking, reporting is initiated, and training is provided. After complete non-live call testing, the system begins supporting live 9-1-1 traffic.

In preparation for deployment and in partnership with the Customer's project team, the West Program Manager (SPOC) finalizes the cutover plan, including procedures for notification concerning schedule specifics. In most cases, ALL services are converted prior to re-homing any telephone service provider end offices. As end office 9-1-1 traffic is cut over, existing 9-1-1 Service Provider legacy CAMA trunks are replaced by A9-1-1 Routing traffic.

Prior to the commencement of cutover, the project team members will hold a cutover meeting with the Customer and the telephone service providers. The purpose of this meeting is to discuss the progress of activities, the cutover readiness.

PSAP training is provided in accordance with the detailed training rollout plans. The system will then undergo a system acceptance test and quality walkthrough. Once complete, and in agreement with the Customer, a go/no go determination will be made and live-traffic cutover will then commence. Once live traffic has moved to the system, the maintenance period begins.

11.6 SOLUTION MAINTENANCE

The Solution Maintenance phase begins once live traffic is transferred onto any part of the system. During this phase, West provides ongoing tiered support services to monitor service level performance, manage help desk requests and trouble tickets, escalate support procedures, and support the Customer to reach the highest level of operational excellence. The solution support team is in place to receive, analyze, and rectify problems and information requests.

The West Project Management methodology is highly influenced by the Project Management Body of Knowledge published by the Project Management Institute. All of the above sections are part of the overall plan or part of the project charter used in projects of this scope.

11.7 MIGRATION PREPARATION

West will work with the Customer to gather and confirm information to support the final network design and data provisioning efforts. A9-1-1 Routing provisioning will include the following data elements:

- PSAP Trunks
- Numbering Plan Digit ("NPD") assignment (if appropriate)
- Trunk assignments by call type (wireline, wireless, VoIP, or any combination)
- Route Lists/Routing Rules:
 - Primary and alternate routes

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- Star code destinations for first responders, PD, Fire, and EMS
- Fixed bridge lists and star code assignments
- PSAP Abandonment routing rules
- West will work cooperatively with each TSP to gather and confirm information necessary to support data provisioning and trunking from the end office to the West system, including the following data:
 - Incoming signal type
 - Call type
 - Implied NPA, if applicable

As TSP migrations complete, West will notify each TSP that their connectivity between their end office and the legacy SR is no longer required.

West will manage a coordinated and secure staged implementation approach that minimizes risk because each stage is planned, implemented, and tested sequentially and independently for functional and operational efficiencies. The implementation project will be managed by an West Project Manager via a formal Implementation Project Plan.

Once the implementation process is complete, calls route through the West A9-1-1 Routing complex, eliminating the need for the existing selective routers, other than any potential services the S/Rs provide with agencies outside the State.

11.8 TESTING OF THE A9-1-1 ROUTING SOLUTION

West will provide the PSAP a list of standard acceptance tests to demonstrate feature functionality of A9-1-1 Routing Services including:

- Correct routing of various call types
- Call hand-offs, transfers and bridging functions
- Operation of the system core and the provisioning elements
- Operation of the West PSAP routers
- Configuration of network elements
- Selective routing
- Trunk only routing
- PSAP abandonment routing
- Alternate routing
- Default routing
- PSAP trunk group management by call type

West will work collaboratively with PSAP personnel to modify this test plan to meet the needs of the PSAP. This may include the addition or removal of test cases as needed or desired. Once the test plan is completed and agreed upon, West will work with the Customer to determine the test protocol specifics such as order of calls. West will work with the Customer to schedule the testing, as appropriate.

West manages the testing process and coordinates all test calls documented in the test plan. This testing is scheduled in accordance with the PSAP's availability. The PSAP is required to provide a resource to answer the test calls and provide documentation, such as screen prints and recordings, for certain calls.

Call tests are generally performed three times, proving the network connectivity is established and voice is delivered and received. Call completion as expected is the acceptance criteria unless otherwise negotiated.

Live traffic cut-over to West A9-1-1 Routing services will be accomplished on an end office by end office basis. As connectivity is established and tested between the end office and the LNGs, West will work with the TSP to conduct pre-migration tests prior to cutover to the LNGs. Once non-live testing has been completed for all EOs, the actual rehome of all EOs will be conducted. West recommends that the live traffic rehomes be scheduled over a period of 24 to 48 hours (depending on the number of EOs to be

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rehomed) and will work with TSPs and the State to facilitate the rehome in a manner which limits impact to the PSAP and TSPs.

Normal test and cut-over times will be during Customer's off-peak daytime "business hours." Test and cutover times outside of the normal business hours will be mutually agreed upon by the Customer and West.

Upon receipt of the Letter of Agency, West will be the primary point of contact for working with the TSPs to develop a migration plan for each end office. In the event that a TSP is uncooperative, West will escalate to the Customer for assistance.

11.9 A9-1-1 ROUTING

A9-1-1 Routing features the following:

- A9-1-1 Routing is a specialized managed network for processing 9-1-1 calls from both traditional and non-traditional voice networks.
- A9-1-1 Routing provides selective routing functionality via an IP-enabled network and SIP interface.
- A9-1-1 Routing delivers 9-1-1 calls from end offices, central offices, mobile switching centers, and VoIP systems to a designated PSAP over redundant, private, IP, highly available MPLS T1 circuits.
- The A9-1-1 Routing service also supports PSAP queuing, PSAP overflow, call transfer, PSAP call origination, and virtual trunk group segregation for different call types.
- A9-1-1 Routing is a robust and highly available routing service that will provide the Customer the ability to configure call routing to dynamically meet its needs. Routing can be managed in real time to meet normal, overflow, and disaster situations.
- A9-1-1 Routing provides the familiar call routing configurations of selective routing, alternate routing, trunk-based routing, default routing, and PSAP abandonment routing.

11.10 A9-1-1 LOCATION DATA MANAGEMENT

A9-1-1 Location Data Management is a complete set of services that provides for comprehensive location validation and error correction, telephone service provider coordination, Service Order Input (SOI) management, and delivery of accurate data for 9-1-1 call support. The services include full standards-based support of all call types including wireline, wireless, and VoIP calls. West will work with the Customer and PSAPs to transition from the PSAP's legacy ALI system to full i3 implementation with GIS-based location validation and other i3 functions and protocols for routing and delivery. The services include:

- Database setup, data preparation, and loading of subscriber records and location validation data
- Service order processing and error resolution
- Management of the existing subscriber database and migration to LIS, CIDB management
- Management of the location validation data and functions
- Customer data management tools
- Subscriber database systems residing at geographically diverse West locations
- Next Gen 9-1-1 system monitoring
- Highly secure system access
- Wireline, wireless, and VoIP call support

11.11 A9-1-1 GIS DATA MANAGEMENT

A9-1-1 GIS Data Management offers a comprehensive and methodical approach to GIS data management that includes flexible procedures individualized to each authority. The overall goal is to create and maintain the authoritative GIS database for 9-1-1 purposes.

GIS data, as provided by the State/PSAPs, is critical within the NENA i3 reference architecture. This data will be used to provision the LVF, ECRF, and PSAP map displays.

The GIS data management offer includes an agreed upon mechanism for data sharing, reporting, and other GIS project management tasks: The State may choose to:

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- Maintain their own GIS data through their existing tools and submits to West for validation and provisioning
- Utilize the West A9-1-1 GIS Data Management package in order for them to maintain their own GIS data, which includes:
 - MapSAG 9-1-1 GIS Data Management System software
 - Training of Agency personnel
 - GIS data collection

11.12 A9-1-1 TXT29-1-1®

One of the first i3 services to be implemented will be the West TXT29-1-1 service which uses the three-digit short code "9-1-1" to enable citizens to text for assistance to a PSAP using regular SMS messaging. The text message is routed to the PSAP based on the location of the receiving wireless provider antenna face, unless an x-y coordinate is sent by the wireless provider, then location is based on the x-y coordinates. The service is managed through the Text Control Gateway, a highly available and high throughput platform that:

- Undertakes PSAP routing of text messages
- Establishes connections to multiple concurrent PSAPs and the ECRC for overflow routing
- Establishes a SIP dialogue with the CPE equipment for the duration of the dialogue until the agent terminates the connection. The SIP dialogue will evolve to an i3 compliant interface once ratified by NENA.
- Converts SMS messages incoming from the wireless carrier/SMS aggregator to the SIP dialogue
- Collects and makes available a transcript of all caller/PSAP interactions

11.13 A9-1-1 CAD INTEGRATION

West will manage coordination with the PSAP's CAD vendor to enable delivery of A9-1-1 Enhanced Data services via the CAD system. The CAD Integration program includes:

- Delivery of the ESMI Partner Guide
- A9-1-1 Data ESMI Network Simulator
- A9-1-1 Data Service Pack/Service that will include the Service Specification and Service Simulator
- Time in the West ESMI Certification lab to validate services end-to-end

West will provide engineering support services throughout the development and testing processes.

11.14 PSAP ABANDONMENT DEVICE

The West Abandonment Module (Acronym "PAD") is a device that is installed by CenturyLink at the PSAP premise. The PAD is a device that allows a 9-1-1 call re-route communication message to be sent to the West Advanced 9-1-1 (A9-1-1) network in the event a PSAP is abandoned or is considered out of service. CenturyLink will provide the (1) PAD for each PSAP as part of this proposal. An West data sheet is included as attachment for review.

12.0 NEXT GEN 9-1-1 IP NETWORK DESIGN

12.1 REFERENCE DRAWING

Please reference file **AZ NG9-1-1 Design**

12.2 LNG LOCATIONS

CENTURYLINK and West will place two LNGs in Arizona at the following data centers:

- Tucson – Involta Data Center
- Phoenix – IOData Data Center

12.3 ECMC LOCATIONS

West's ECMCs are located at the following two locations:

- Englewood, CO

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- Miami, FL

12.4 VIPER HOST LOCATIONS

CENTURYLINK will install VIPER Hosts in the following two data centers:

- IO Data Center –Phoenix, AZ
- CENTURYLINK Data Center - Highlands Ranch, CO

12.5 VESTA HOST LOCATIONS

CENTURYLINK will install VESTA Hosts in the following two data centers:

- IO Data Center –Phoenix, AZ
- CENTURYLINK Data Center - Highlands Ranch, CO

12.6 LNG TO ECMC IP NETWORK DESIGN

CENTURYLINK will provide dual 1Gig diverse IP connectivity via the CENTURYLINK provided IQ MPLS Private Port from the LNG to the ECMC. Each 1Gig loop over fiber will hone to a diverse CENTURYLINK POPs.

Based on bandwidth requirement of 75mb these links will have less than 10% utilization and leaves significant capacity for growth.

12.6.1 Bandwidth Requirements

LNG to ECMC bandwidth is determined by the following formula:

(Number of 9-1-1 SR Trunks) x (144kb)

Based on the 9-1-1 trunk count for Arizona, the required bandwidth from the ECMC to the LNG is

- Airbus = 255 or (255 x 144kb = **36,720kb**)
- West = 262 or (262 x 144kb = **37,728kb**)

Total required bandwidth is 36,720kb + 37,728kb = 74,448kb or **75mb**

12.6.2 Network Protocols

CENTURYLINK will run layer 2 and layer 3 protocols that will provide fast convergence in event a link should fail. This will include layer 2 SLA and layer 3 BGP on the outward facing interfaces at the LNG and ECMC and layer 3 VRRP or HSRP on the inward facing interfaces.

12.6.3 Edge Devices

Each 1Gig loop will terminate on diverse edge routers/switches at both the LNG and ECMC.

12.7 ECMC TO HOST CPE SYSTEMS

12.7.1 West VIPER

Geo Diverse VIPER Hosts will be installed at the ECMCs. As such, the network connecting the ECMC to VIPER Hosts will be local and will not require an IQ MPLS Private Port. Connectivity between the two VIPER Nodes is over the existing West cloud connecting the two ECMCs.

12.7.2 Airbus VESTA

For ECMC to VESTA Hosts, CENTURYLINK will be providing dual 1Gig diverse IP connectivity via a CENTURYLINK provided IQ MPLS Private Port. Each 1Gig loop over fiber will hone to diverse CENTURYLINK POPs. As calculated below ECMC to VESTA Hosts require 37mb bandwidth. Each 1Gig loop will have less than 5% utilization and provides significant capacity for growth as required.

12.7.3 Bandwidth Requirements

ECMC to Host Sites is determined by the following formula:

(Number of 9-1-1 SR Trunks) x (144kb)

Based on the 9-1-1trunk count for Arizona, the required bandwidth from ECMC to VESTA Hosts is

- Airbus = (255 x 144kb = **36,720kb**)
- West = (262 x 144kb = **37,728kb**). As this traffic will stay local within the ECMC or traverse the West cloud, CENTURYLINK IQ Private Ports are not required for this connectivity.

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12.7.4 Network Protocols

CENTURYLINK will run layer 2 and layer 3 protocols that will provide fast convergence in event a link should fail. This may include layer 2 SLA and layer 3 BGP on the outward facing interfaces at the ECMC and Hosts and layer 3 VRRP or HSRP on the inward facing interfaces.

12.7.5 Edge Devices

Each 1Gig loop will terminate on diverse edge routers/switches at both the ECMC and VESTA Hosts. VIPER hosts will terminate on diverse routers and switches within the ECMC.

12.8 Host CPE TO REMOTE PSAP CPE

12.8.1 West VIPER Host Sites to Remote Sites

CENTURYLINK will provide dual 1Gig diverse IP connectivity via the CENTURYLINK provided IQ MPLS Private Port from the VIPER Hosts at the ECMC to the CENTURYLINK MPLS cloud. Each 1Gig loop over fiber will hone to a diverse CENTURYLINK POPs. Based on calculated required bandwidth below of 80mb, each 1Gig link will have less the 10% utilization.

CENTURYLINK will provide dual IQ MPLS Private Port loops to each VIPER remote PSAP. Each loop will hone to diverse CENTURYLINK POPs. Bandwidth will vary depending on position count of each PSAP. Most loops to the IQ MPLS network will be over DS1 or bounded DS1s (NxDS1). For sites requiring greater than 10.5mb of bandwidth, the local loop may be Ethernet over copper or Ethernet over fiber.

Approximately 50% of VIPER 9-1-1 positions will be primarily homed to Node A and 50% to Node B. If one of the VIPER nodes fails, then 100% of the VIPER system's traffic will be served by the alternate surviving node.

12.8.2 Bandwidth Requirements

Bandwidth requirements to each remote PSAP are estimated by the following formula:

Per PSAP Bandwidth = 1000kb + ((Position Count) x (100kb))

Bandwidth requirements for each VIPER host are estimated by the following formula:

Host Bandwidth = Sum of PSAP Bandwidth Required

Based on the total PSAP Count and VIPER Position Count for Arizona, the required bandwidth is

PSAPs = 42

Positions = 375

$(1000\text{kb} \times 42) + (375 \times 100) = 79,500\text{kb}$ or **80mb**

CENTURYLINK and West will determine the exact required bandwidth for each PSAP after site survey and call flow meeting has been conducted. Remote PSAP bandwidth above is only for estimating Host bandwidth requirements. CENTURYLINK's Managed Services Solution will provide the required bandwidth to each PSAP to deliver 9-1-1 calls, GIS updates, access to MIS databases, remote monitoring / response, and remote access.

12.9 AIRBUS VESTA HOST SITES TO REMOTE SITES

CENTURYLINK will provide dual 1Gig diverse IP connectivity via the CENTURYLINK provided IQ MPLS Private Port from VESTA Host sites to the CENTURYLINK MPLS cloud. Each 1Gig loop over fiber will hone to a diverse CENTURYLINK POPs. Based on calculated required bandwidth below of 70mb, each 1Gig link will have less the 10% utilization.

VESTA Hosts with Split Core as will be deployed for Arizona, require a layer 2 connection between each core. This bandwidth must be equal to the sum of required bandwidth of the host system or 140mb.

CENTURYLINK will provide a 1Gig layer 2 fiber connection between the two VESTA cores.

CENTURYLINK will provide dual IQ MPLS Private Port loops to each VESTA remote PSAP. Each loop will hone to diverse CENTURYLINK POPs. Bandwidth will vary depending on position count of each PSAP. Most loops to the IQ MPLS network will be over DS1 or bounded DS1s (NxDS1). For sites requiring greater than 10.5mb of bandwidth, the local loop may be Ethernet over copper or Ethernet over fiber.

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VESTA Core A is the Active Core while Core B runs in standby mode. A layer 2 network provides network connectivity between the two cores. If a failure occurs at Core A, then 100% of the VESTA system's traffic will be managed by Core B.

12.9.1 Bandwidth Requirements

Bandwidth Requirements to each remote PSAP are estimated

Per PSAP Bandwidth = 1000kb + ((Position Count) x (100kb))

Bandwidth requirements for each VESTA host are estimated by the following formula:

Host Bandwidth = Sum of PSAP Bandwidth Required

Based on the total PSAP Count and VESTA Position Count for Arizona, the required bandwidth is

PSAPs = 37

Positions = 241

$(1000\text{kb} \times 37) + (241 \times 100) = 61,100\text{kb}$ or **70mb**

CENTURYLINK and Airbus will determine the exact required bandwidth for each PSAP after site survey and call flow meeting has been conducted. Remote PSAP bandwidth above is only for estimating Host bandwidth requirements. . CENTURYLINK's Managed Services Solution will provide the required bandwidth to each PSAP to deliver 9-1-1 calls, GIS updates, access to MIS databases, remote monitoring / response, and remote access.

12.9.2 Network Protocols

CENTURYLINK will run layer 2 and layer 3 protocols that will provide fast convergence in event a link should fail. This may include layer 2 SLA and layer 3 BGP on the outward facing interfaces at the Host and remote sites and layer 3 VRRP or HSRP on the inward facing interfaces.

12.9.3 Edge Devices

Each 1Gig loop will terminate on diverse edge routers/switches at both the Host sites and Remote sites.

12.10 SR 9-1-1 TRUNKS FROM LSR TO LNG

- There will be two LNGs for Arizona, Phoenix and Tucson
- LNG will be located in data centers
- As PSAP is migrated to NG9-1-1, EM trunks between LSR and PSAP are migrated to SR trunks between LSR and LNG
- CENTURYLINK's design is a ratio of 1.3 SR trunks for every EM trunks. May be adjusted as monitoring dictates to ensure a P.01 grade of service

12.10.1 P.01 Grade of Service

P.01 Grade of Service is the responsibility of each telephone carrier. CENTURYLINK is only responsible for ensuring that it meets a P.01 service level for 9-1-1 traffic over its 9-1-1 trunks. To ensure a P.01 service level, CENTURYLINK will:

- Run a report within 30 days after migrating a PSAP over to the NG9-1-1 network
- Run a report every quarter on all PSAPs that have migrated over to the NG9-1-1 network
- Provide copies of these reports to the PSAPs
- Provide these reports at no additional charge to the customer.

12.11 ECMC CONNECTIVITY – REFER TO ATTACHED DRAWING “AZ NG9-1-1 DESIGN”

- Two ECMC located in Miami FL and Englewood CO
- Each LNG honed to both ECMCs (VPN A and VPN B) through diverse POPs
- Estimated required bandwidth for VPN A and VPN B is 75mb
- Calls routed through LNG to ECMC (VPN A & B) and then from ECMC to Host (VPN C & D)
- All network edge devices are monitored
- 1Gig Connectivity from ECMC to LNG and ECMC to Hosts

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12.12 Host VIPER to ECMC and Host VIPER to Remote PSAP VIPER Connectivity – Refer to attached drawing “AZ NG9-1-1 Design”

- VIPER Hosts are located in the West ECMC in Miami FL and Englewood CO
- VPN C & D are local – IPSR to VIPER Host
- VPN G & H are for Host / Remote connectivity
- Each VIPER remote is honed to both VIPER Host
- Each VIPER Host is honed to diverse POPs
- Required bandwidth for each VIPER remote varies by position count. Most remote sites will use a bonded DS1 (NxDS1) local loop
- VIPER Host bandwidth is estimated at 80Mb
- Bandwidth from VIPER host to MPLS cloud will be 1Gig

12.13 Host VESTA to ECMC and Host VESTA to Remote VESTA PSAP - Refer to attached drawing “AZ NG9-1-1 Design”

- VPN C & D is connectivity between IPSR and Host VESTA
- VPN C & D required bandwidth is 37mb. Actual connectivity will be 1Gig
- VESTA Hosts are honed to each ECMC through diverse POPs
- VESTA Hosts will be installed in two data centers with one in Phoenix AZ and the other in Highlands Ranch CO
- Highlands Ranch data center is same building and location as the CENTURYLINK POP
- VPN E & F is connectivity between VESTA Host and VESTA Remotes
- VPN E & F required bandwidth is 70mb. Actual bandwidth is 1G
- VESTA Remotes bandwidth will vary depending on position count
- VESTA Remotes connectivity will mostly be by bounded DS1 (NxDS1)
- Redundant 1Gig Layer 2 connectivity between VESTA Core A and VESTA Core B
- All network edge devices are monitored

13.0 CPE MANAGED SERVICE

13.1 SOLUTION SUMMARY

CENTURYLINK's managed service solution is a Host / Remote architecture. Current deployments are using NG9-1-1 systems from West (VIPER) and Airbus (VESTA 4.x). The solution includes the following applications:

- NG9-1-1 Call Taking Systems
 - Airbus VESTA 4.x
 - West VIPER
- MIS Applications
 - West Power MIS
 - Airbus Aurora MIS
- GIS Mapping Applications
 - West Map Flex
 - Airbus Vela
- GIS Updating Applications
 - West Map Flex
 - Airbus Data Sync
- Services
 - Remote Monitoring and Response
 - Anti-Virus
 - Patch Management
 - Software Upgrades
 - Proactive Hardware Maintenance

CENTURYLINK will deploy its Managed NG9-1-1 CPE solution in a single Geo Diverse Host / Remote configuration for each 9-1-1 CPE Manufacturer. Each host location will be served by redundant and diverse MPLS circuits. Each remote site will be served by a pair of redundant MPLS circuits

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NG9-1-1 calls will be delivered over the Arizona ESInet to host locations, where the specific 9-1-1 call handling equipment will route to the appropriate PSAP over a separate private IQ MPLS Private Port VLAN. Each manufacturer's NG9-1-1 host system will have a redundant pair of call processing servers and ALI controllers, or cores. These secure cores (Core A & Core B) will be deployed in a geo diverse configuration.

13.2 EXAMPLES OF HOST REMOTE SYSTEMS

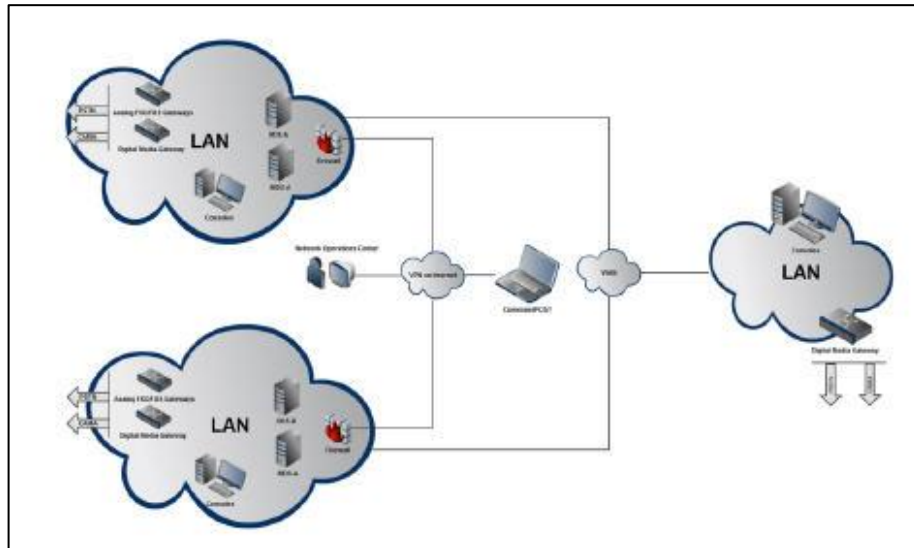


Figure 13.1 – VESTA in a Distributed GEO Diverse Configuration

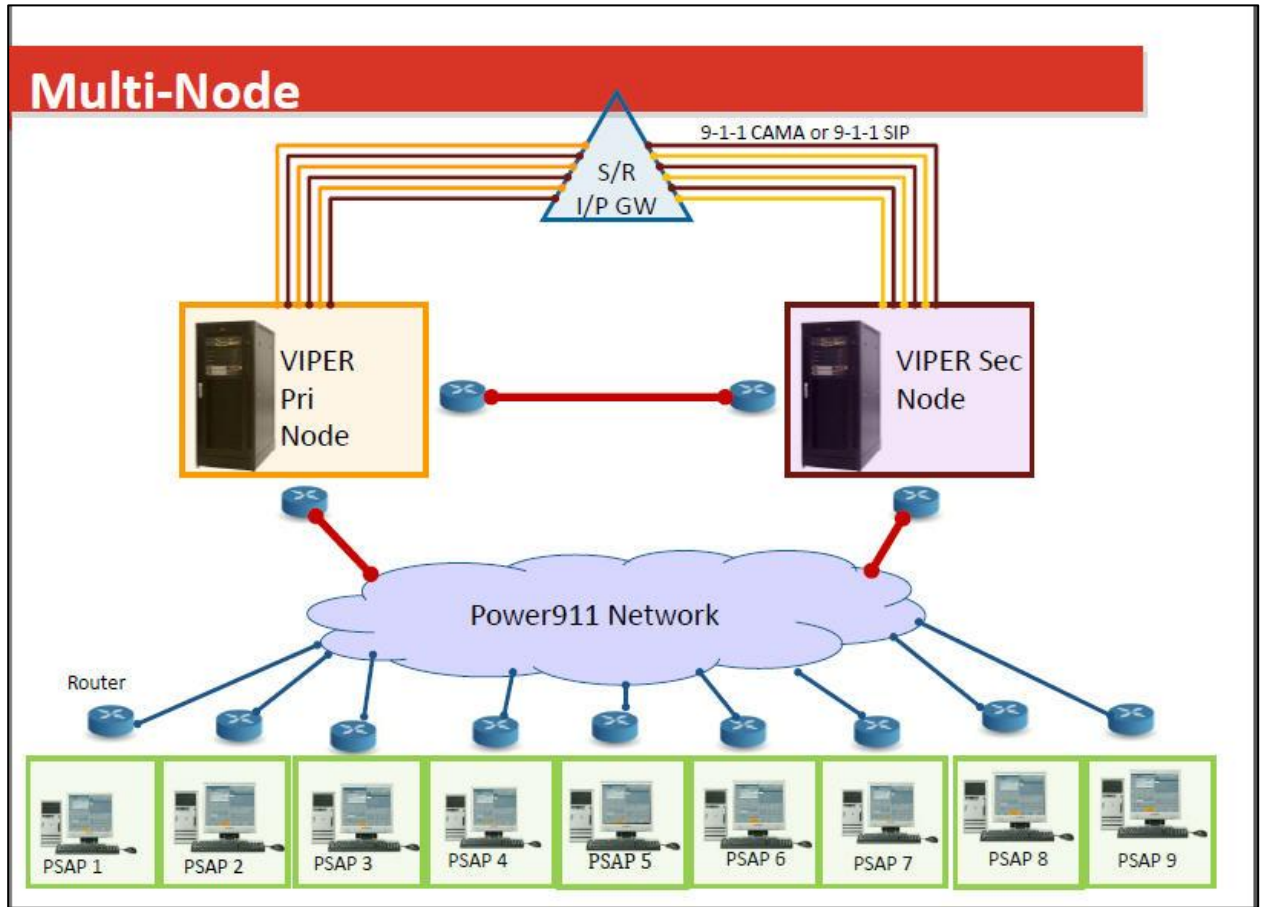


Figure 13.2 – VIPER GEO Diverse Multi-Node Host Remote

13.3 SYSTEM HOSTS

CENTURYLINK’s solution includes the required space and facilities to support the host systems. For each CPE system manufacturer, CenturyLink shall provide:

- Co-Location Space for host system components
- All racks and power requirements
- NG9-1-1 Core Components - Call Processing Servers, ALI Controllers, and system configuration databases at each host location
- MIS Servers – Single Deployment
 - Single Power MIS server at one of the two host sites
 - Single Aurora MIS server at one of the two host sites
- GIS Host Servers – Single Deployment
 - Single GIS Central Server at one of the two host sites
 - Single DataSync server at one of the two host sites
- Network Management Server
- Master Time Clock – Each host system
- Peripherals – KVM and monitors
- Backup Devices
- LAN switches
- Routers
- Patch Panels
- All cabling

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13.4 REMOTE PSAPs

CENTURYLINK will provide the following as ordered by individual PSAP:

- NG9-1-1 Call Taking equipment, including Gateways (FXO, FXS, and T1)
- GIS Mapping applications
- MIS Applications
- Remote Monitoring and Response
- Anti-Virus
- Firewall

13.5 PSAP EQUIPMENT

A sample of equipment to be installed is provided as a representative list only. The actual equipment requirement will vary PSAP to PSAP.

13.5.1 Backroom Equipment

- Racks
- UPS
- Gateways – FXS, FXO, and Digital ISDN T1
- LAN switches
- Serial Ports for serial hand offs (Example: CAD and DLR)
- Patch Panels
- Patch Cables
- Application servers (Example: GIS server for map updates)
- Monitors
- KVM
- CDR outputs to customer CAD and Recorders

13.5.2 Front Room Equipment

- NG9-1-1 Call taking Workstation, includes:
 - Keyboard & Mouse
 - Monitor for call taking GUI (19" or 22" LCD)
 - Monitor for mapping GUI (19" or 22" LCD)
 - Audio Control Box
 - 2 Headset Jacks
 - 2 Port KVM (Arbitrator)
 - Genovation Keypad
 - Extension cables
- Network Printer (1)
- Position UPS and Power Strips

13.6 CABLING

If, during site survey CenturyLink determines PSAP cabling is required, CENTURYLINK will install four (4) CAT6 drops to each 9-1-1 call taking position to 9-1-1 CPE equipment in back room. These four drops will be for exclusive use by CENTURYLINK for the 9-1-1 CPE equipment being provided to the PSAP by CENTURYLINK. The following will be included;

- (4) CAT 6 drops
 - (2) for 9-1-1 position CPU
 - (1) for audio to customer provided recording equipment
 - (1) spare
- (1) CAT 6 drop for network printer
- Cables from 9-1-1 CPE equipment to IQ MPLS Private Port Equipment
- CAT 3, 5, or 6 cables from 9-1-1 CPE equipment in backroom to IDF backboard in backroom
- Cabling will include all required jacks, patch panels, and patch cables

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13.7 ADMIN LINES

CENTURYLINK will provide PSAPs with Analog or Digital gateways for connecting analog administrative or ringdown lines, PSTN ISDN PRI lines, and tie lines to PSAPs PBX. PBX must support PRI ISDN / QSIG signaling.

13.8 CDR OUTPUTS

CENTURYLINK will provide CDR outputs to customers' CAD and Recording equipment. These outputs will terminate on or within 20 feet of CENTURYLINK's backroom equipment at PSAP

13.9 HEADSET INTEGRATION

CENTURYLINK will provide optional headset integration depending on PSAP requirement. CENTURYLINK D-mark is at the Audio Control Box. CENTURYLINK will work with PSAP radio maintenance provider for connectivity and testing.

13.10 LOGGING RECORDER

CENTURYLINK will provide an analog voice handoff to PSAPs logging recorder from the workstation audio control box. This handoff is from an 8 PIN plug, 7 feet long, off of the audio control box.

CENTURYLINK will work with PSAP's logging recorder vendor assuring audio is being sent to recorder. VOX or Contact Closure can be configured depending on each PSAPs requirement.

ANI can be sent for CDR to logging recorder if required by PSAP. CENTURYLINK will hand this CDR output off to PSAP in the 9-1-1 CPE equipment rack. PSAP would be responsible for extending to their recording equipment.

13.11 TEXT MESSAGING AND TEXT MESSAGING SERVICES

While the CENTURYLINK NG9-1-1 solution will support Text Messaging Services, the service offering is not part of the solution scope. Optional pricing will be provided to the PSAPs if they wish to implement the text messaging services.

13.12 TEXT MESSAGING CPE INTERFACES

Both proposed CPE products, West's VIPER and Airbus's VESTA provide an integrated text messaging interface. This interface is included in the CENTURYLINK solution.

13.13 EXAMPLES OF EQUIPMENT NOT INCLUDED AT REMOTE PSAP SITES

- Master Time Clock – Only required at host sites.
- Electrical Power
- Additional administrative workstations (Example: For MIS reporting)
- Reader boards
- Firewalls – Connectivity between PSAP LAN and local agency LAN
- Headsets
- Additional printers

14.0 LOCAL GIS DATA MANAGEMENT

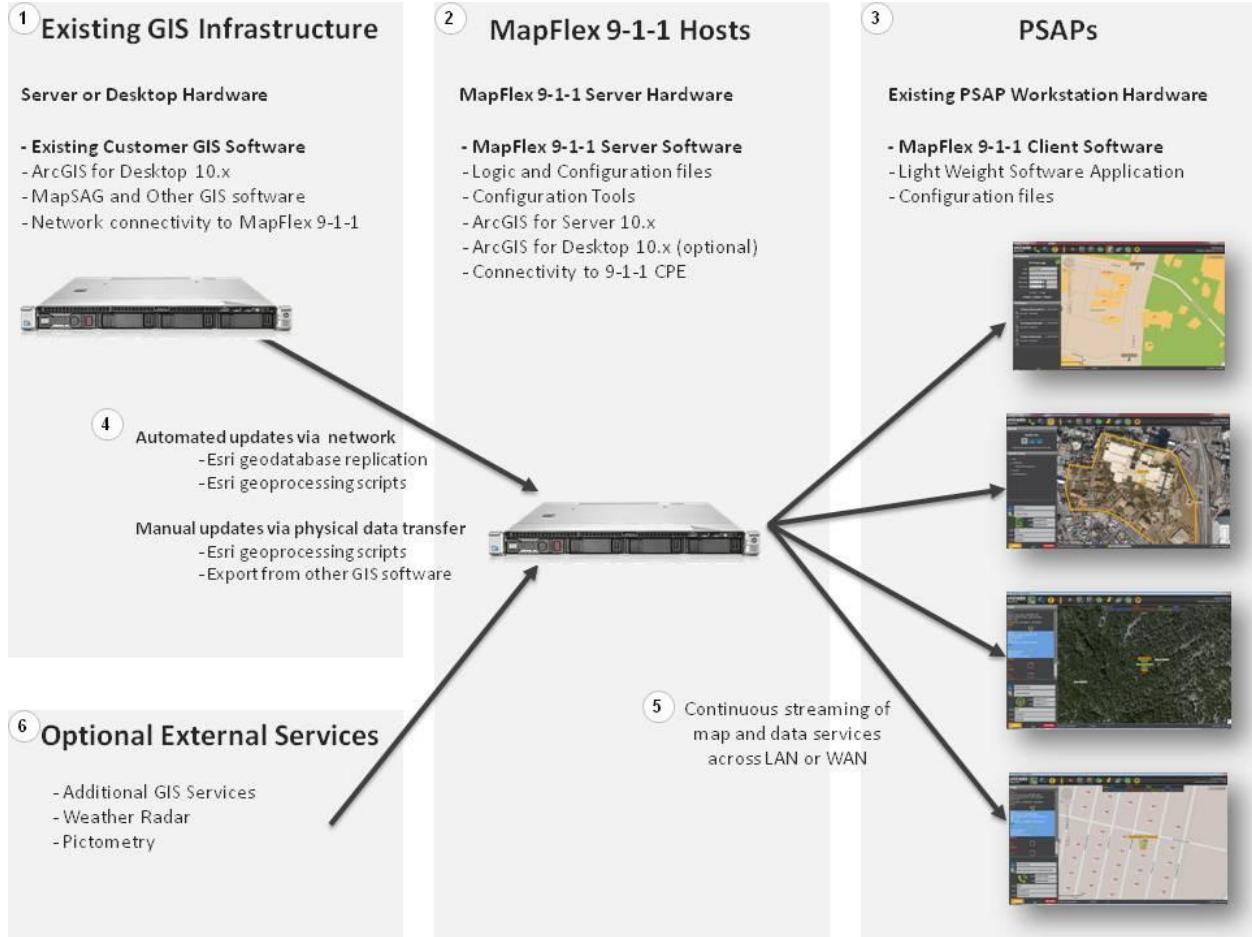
GIS Data Management will be a responsibility of the PSAP customer. A Centralized solution will be provided for updating Maps over the specific NG9-1-1 CPE vendors host / remote network. Below are vendor specific responses.

14.1 WEST

The MapFlex 9-1-1 architecture and data update process is described in the diagram and numbered, associated text below.

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1 Existing GIS Infrastructure

- MapFlex 9-1-1 utilizes your agency's existing GIS infrastructure to enable the use of your accurate and complete local GIS data.
- MapFlex 9-1-1 can seamlessly consume data from Esri ArcGIS 10.x or from other GIS software that is capable of exporting data in an Esri compatible format.
- Network connectivity to the MapFlex 9-1-1 Host Server enables automated, near real time GIS data updates.

2 MapFlex 9-1-1 Hosts

- A dedicated MapFlex 9-1-1 Server(s) is the core of the MapFlex 9-1-1 solution.
- MapFlex 9-1-1 Server(s) Software is based on ArcGIS for Server 10.x.
- All map and data configuration files are stored on this centralized server to enable fast and easy updates.
- Connects to your existing 9-1-1 system to geocode 9-1-1 calls and events.

3 PSAPs

- Lightweight MapFlex 9-1-1 Client Software is installed on existing PSAP workstation hardware to consume the MapFlex 9-1-1 application and data from the MapFlex 9-1-1 Server.

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4

Data Updates

- Automated updates can be enabled via network connectivity between GIS server/desktop and MapFlex 9-1-1 server(s)
- Manual updates are also available via data extract and physical data transfer if no network connectivity exists.

5

Data Streaming

- When the MapFlex 9-1-1 Server(s) is updated with new GIS data the PSAP telecommunicators instantly see the new updates without having to restart their systems.

6

Optional External Services

- MapFlex 9-1-1 can optionally consume data services such as weather radar using existing internet connectivity.

For PSAPs that are not utilizing MapFlex 9-1-1, West will provide services to update other mapping products' local servers. These services will utilize a similar workflow as the SIF. West will work with each mapping provider to understand the data requirements for each application. Finally, West will export data to each mapping provider's designated location at each PSAP in the required Esri data format and database schema. This data update process can be performed using a mix of Geodatabase replication, custom scripting or manual update processes over the network, where connectivity to the CENTURYLINK network exists, or manual updates via data extract and physical data transfer if no network connectivity exists, as required with each provider. West performs a similar service today with several providers for the entire State of New Mexico.

West's 9-1-1 SIF System is a managed service that encompasses an interface with multiple agencies to obtain locally maintained GIS data, perform error detection, normalize the data, transforming it into a common data schema, performing basic validations, reporting on gaps/overlaps that exceed a configurable threshold and provisioning to Next Generation 9-1-1 (NextGen 9-1-1) systems including Emergency Call Routing Function (ECRF), Location Validation Function (LVF) and MapFlex.

14.1.1 Data Requirements

The West SIF is designed to work with most customer provided GIS data. The GIS data accepted includes Esri formats personal Geodatabase, file Geodatabase, or shapefile. 9-1-1EGDMS utilizes a NENA NG9-1-1 GIS Data Model V1 compliant design, and the 9-1-1EGDMS system will help customer data comply with these standards and guide them to meet the minimum data requirements. There may be cases where minor alterations of the customer data are required. West GIS Analysts will review the GIS data format and recommend any necessary changes.

The feature classes supported by West's SIF include:

- Street Centerlines - Street centerline data for the agency's jurisdiction with optional street name alias tables.
- Fire Response Boundary - Fire response boundary polygons for the agency's jurisdiction.
- Address/Structure Location - Address/structure points for the agency's jurisdiction.
- Law Response Boundary - Law response boundary polygons for the agency's jurisdiction.
- PSAP Area Boundary - Public Safety Answering Point boundary polygons for the agency's jurisdiction.
- EMS Response Boundary - EMS/medical response boundary polygons for the agency's jurisdiction.
- Emergency Service Zone - Service response boundary (ESN boundary) polygons that include Fire, Law, and EMS response agencies in the jurisdiction.
- Municipal Boundary - Municipal boundary polygon(s) for the agency's jurisdiction.
- Authoritative Boundary - Authoritative boundary polygon that covers the geographic region in which the agency has jurisdiction.

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14.1.2 User Interface

The West customer portal is a fully web-based solution that serves as West's front end user interface for the National Emergency Number Association (NENA) Spatial Information Function (SIF) requirement. The portal provides secure GIS file transfer to West and customers are able to maintain their local database schema and configure database changes on the fly. The portal provides:

- Secure File transfer via West Unified Portal (IUP) with secure 2 factor authentication
- Popular file format support for File Geodatabase, Personal Geodatabase and Shapefile
- Automated schema change detection and error notification
- Attribute field mapping configuration driven by the customer
- Automated Email notifications for upload and processing status
- GIS Data Validation Report Retrieval

The web application allows customers to upload their GIS data, to capture and manage the metadata related to the contents of GIS uploads, to convey processing status of the uploaded data, and to access reports generated during processing and validation of those uploads. 9-1-1 GIS data is managed by our customers in different forms and by different entities at different levels of government. The county or other governmental agencies which are responsible for providing the spatial addressing information may have other data management responsibilities beyond 9-1-1, and as a result we expect most customer schemas to be unique and dynamic.

The key functionality of the portal is the schema configuration user interface (UI) and GIS data interrogator. The field mapping tools allows customer to configure their database field mappings and update them when necessary. Upon successful data transmission, an automated process extracts the data from its compressed (.zip) format and reads the contents of the database or shapefiles. The data interrogator automatically checks that the data contents are valid, in the correct format, with the required attribute fields as mapped and stored within the system's schema field mapping configuration template. Any discrepancy or schema change triggers automatic notification to the data provider, alerting them that action is required. In the event that the schema was changed and saved fields are missing or their properties have changed, the customer can make the necessary changes immediately. This allows each customer to maintain individual database schemas and make changes as necessary within the portal UI.

14.1.3 System Architecture

The West web portal is the centerpiece of interaction between the various users of the system, and the server-side systems will store, process and distribute the incoming customer GIS data. Application web services will provide enhanced and automated processing capabilities on the customer GIS data, allowing for fast and large scale throughput. Enterprise GIS datastores will support QA/QC activities, and also serve as the SIF. The SIF will also interact with application web services to provision GIS data to i3 datastores including ECRF/LVF, MapFlex, and DataSync.

The architecture for the solution is based on leveraging a suite of commercial software tools which will provide the core system capabilities to store and manage GIS data, manage the processing workflows, and perform various geospatial extract, transform, load (ETL) roles. Automated processing tools include Esri ArcGIS for Server to provide enterprise GIS data storage and management, FME from Safe Software to provide geospatial ETL capabilities, and Workflow Manager from Esri, to manage the overall processing workflows, automation and processing job state management and reporting capabilities.

The West solution involves proprietary delta detection tools that allow customers to submit full GIS databases as opposed to only added/changed/deleted features. As many GIS agencies do not possess the licensing requirements for Esri replication, and many do not maintain Unique IDs, the ability for all customers to isolate and submit only changed features is not reliable or easily achieved. Not only does this solution support any customer data (shapefile, Personal Geodatabase or File Geodatabase formats) it does not require additional licensing and does not require that the agency maintain UIDs. With incoming customer data separated into changed and unchanged sets, and the changes flagged as being geometry based, or attribute based, the West solution will run both validation and coalescing operations on only the changed data alone, which will expedite the overall processing time and streamline the provisioning update processes.

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The upload details screen allows user to configure the upload, and view an activity log for the selected upload.

EGDMS Feature Class	Agency Feature Class	State		
Street Centerlines	Roads	Field Error(s) Present		
Feature Count:38	Projection:NAD_1983_StatePlane_Texas_Cent...	<input type="button" value="Create Note"/>		
Select an Agency Attribute to map to the listed EGDMS Attributes.				
EGDMS Attribute	Agency Attribute	Type	Length	State/Status
*Left from Address	L_ADD_FROM	Integer		Pending Review
*Left to Address	N/A	Integer		Accepted
*Right from Address	ALT_NAME	Integer		Accepted
*Right to Address	C1_EXCEPTI CREATION_D	Integer		Accepted
Parity Left	CREATION_U			
Parity Right	DIVIDED			
Street Pre-Modifier	LCOMMUNITY LCOUNTY			
*Street Prefix Directional	LESN	String	2	Accepted
*Street Name Pre-Type	L_ADD_FROM L_ADD_TO MODIFY_DAT MODIFY_USE			Rejected Previous Mapping Missing

The user can configure their schema field mappings, and correct any errors using the Field Mapping Tools. Schema validation includes automated data type and field length warnings/errors

14.2 AIRBUS ORION VELA

The Arizona 9-1-1 Program office, Local 9-1-1 System Administrator, or PSAP will maintain the ORION Vela map displays (Templates) for all PSAPs on their map administration workstation. They will publish these Templates and map data updates to the DataSync Center server. The DataSync Center server will synchronize Template and map data updates on a scheduled and/or instantaneous basis. PSAPs with more than six positions will require a DataSync Edge server to be located at the PSAP. DataSync clients on PSAP workstations will periodically check (default is 5 min) for available updates on their respective DataSync server. When an update is available, DataSync client will pull the update package down from its respective Edge or Center server in the background without interfering with active applications. When the update is downloaded and processed a notification appears to the call taker stating that an update is available. They may then restart the ORION Vela application at their leisure.

Map data updates may be passed to the Arizona 9-1-1 Program office, Local 9-1-1 System Administrator, or PSAP via mapped network drives to the DataSync Center server. Current regional map administrators may continue to maintain their map displays and would pass their Template updates with their map data updates.

Orion Vela can use the data from the SIF. This is done using the field names and file names of specific map data layers. Ultimately, the data must be provided in shapefile format.

15.0 IP RECORDING OF 9-1-1 CALLS

There are several options available for recording of the solution. The methodology chosen will depend on the PSAP’s needs, CPE vendor capabilities and Logging Recorder capabilities.

The most common option in an ESInet environment is position based recording. The West A9-1-1 VIPER proposal provides an analog output of position audio at the headset/handset jack level to include radio traffic if radio audio is provided to that jack by the PSAPs radio vendor. The West solution is capable of headset arbitration of the telephone/radio traffic with the arbitration managed by the West telephone, or managed by the radio provider. CenturyLink will work with the PSAPs to determine the operational

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architecture that works best for the PSAP, and the PSAP will need to engage their radio vendor for the appropriate radio connections.

Airbus VESTA provides an analog output of position audio at the headset/handset jack level and is capable of headset arbitration of the telephone/radio traffic with the arbitration managed by the Airbus sound device or managed by the radio provider. CenturyLink will work with the PSAPs to determine the operational architecture that works best for the PSAP, and the PSAP will need to engage their radio vendor for the appropriate radio connections.

NENA is in process of developing an i3 specification for Logging Recorders. West will meet the NENA i3 build-to standard for a new IP logging recorder interface, as published at the time of deployment of said interface in Arizona PSAPs. West participated in NENA ICE 8 to demonstrate this capability.

As an option, West offers a cloud based logging recorder service for NG9-1-1 voice traffic in the West cloud core call taking solution. This would capture voice traffic at each redundant West data center, and provide for a browser based access through separate secure paths to recording management. Options are also available to provide for alternate IP networking for migration of the recording files to local storage devices for local, or consolidated access. The specific architecture and technology would depend on the Logging Recorder vendor selected.

15.1 WEST VIPER

From the CPE perspective, West has available a 3rd Party IP Recorder Interface Kit providing for the following:

15.1.1 Physical IP packet-capture solution

This is the mechanism by which the VIPER SIP and RTP packets are securely shared with the 3rd party recorder at the VIPER switch level.

15.1.2 VIPER 3rd party recording license

This is the VIPER-side license that enables a 3rd party recorder to have a one way IP connection to VIPER.

15.1.2.1 Span port method

Two Small form-factor pluggable transceiver (SFP) modules are inserted into each VIPER LAN switch pair. There will be one SFP per switch. Each SFP module enables a gigabit SPAN IP output flow, which will feed either a primary or a secondary 3rd party recorder.

15.1.2.2 Passive Tap method

Passive taps are placed in the voice path between the VIPER VOIP servers and the VIPER LAN switches. The taps all feed an aggregator module which provides two output flows. These will feed both a primary and a secondary 3rd party recorder. One Tap Port Set (P10010) is needed per VIPER node from where tapping is to take place.

Please see the attached Product Bulletin for greater detail on the Third Party IP-Recording Kit

15.2 AIRBUS VESTA

For Airbus System, IP recording can be done using the Span port method as described in section 15.1.2.1 above.

15.3 CENTURYLINK IP CLOUD RECORDING SERVICE

As of January 2016, CENTURYLINK is engaged in developing a cloud recording solution for the hosted Airbus VESTA.

15.4 IP RECORDING COSTS

IP Recording is not included with the current service offering. If IP recording is required at the PSAP or Host System level, additional charges would apply for equipment and labor.

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16.0 CUSTOMER TRAINING

CENTURYLINK will provide the following training options to PSAPs. It is assumed all training will take place at customer location and customer will provide a facility appropriate for conducting training.

16.1 AIRBUS ADMIN TRAINING

CENTURYLINK will provide administrative training for Airbus Systems for each PSAP as follows. Each class size is limited to 8 students.

- (1) VESTA Administrative class
 - Course Duration: 1 Day
- (1) Activity View Administration class
 - Course Duration: 4 Hours
- (1) DataSync Administration class
 - Course Duration: 1 Day

16.2 AIRBUS TRAIN-THE-TRAINER AGENT TRAINING

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 limited to 8 students and course duration is 1 day.

16.3 AIRBUS CUT-OVER COACHING

CENTURYLINK will provide a trainer on site on day of cut over to answer any questions and or assist call takers as they transition to the new system.

16.4 AIRBUS WEBINARS

Airbus's training department will develop a value added free quarterly webinar based service to review what's new, answer questions, etc. Topics are TBD, but might include:

- Major System Changes
- New Features
- Important need to know information
- Etc

16.5 WEST ADMIN TRAINING

CENTURYLINK will provide one (1) on-site training session for End User administrators. This training is expected to last for two (2) full days (6 training hours per day). The End User may have up to eight employees attending the West on-site training as long as the End User provides an adequate training facility and workstations/computers for number of attendees. In addition, one additional day of Administrator training is provided to support the cutover.

16.6 WEST AGENT TRAINING

West will provide either end-user training or train the trainer training for the End User, as follows:

- Training the Trainer - one (1) on-site training session for up to eight End User Power 9-1-1 call takers/dispatchers with a maximum of 2 people per workstation. This training is expected to last for two (2) full days (6 training hours per day). Training will be provided in train-the-trainer format.
- End User Training - in lieu of Training the Trainer West can provide all End User Training. Training is provided to a maximum of eight End User call takers/dispatchers, per training session, with a maximum of two training sessions per day. One workstation for each two students is required. West includes sufficient days to have up to 8 trainees per session, for all call takers at a VIPER Power 9-1-1 site upon deployment, i.e. Number of sessions = Number of call takers divided by 8 Additional Optional Training days for a maximum of eight End User call takers/dispatchers per session may be purchased to accommodate all call taker/dispatchers.

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16.7 AD HOC TRAINING

CENTURYLINK will provide onsite technician support on ad-hoc basis, at no additional charge to PSAP, to demonstrate features for call taker supervisors. This is not in lieu of formal training.

17.0 CENTURLINK LEVEL OF SUPPORT

17.1 REPAIR AND RESPONSE TIMES

CENTURYLINK Response Times includes the following with our Next Gen 9-1-1 Managed Services Agreement. Response Time shall be defined as the amount of time expired between the time in which the issue is detected by the CENTURYLINK NOC to the time that a qualified technician is on-site and actively troubleshooting the issue.

- CENTURYLINK shall provide designated PSAP personnel with notification of an outage within thirty (30) minutes after discovering a service affecting issue. Notification shall be made via a mutually agreed upon means, e.g., phone, email, text, or a combination thereof. Updates on the service affecting issue shall be provided no later than two hours after initial notification with updates being provided as mutually agreed upon between designated PSAP personnel and CENTURYLINK.
- Response Time Coverage - Seven (7) days per week, 24 hours per day, 365 Days of the year with a two (2) hour (maximum) response time to have a CENTURYLINK technician on site for all 9-1-1 related hardware, software, network repair/maintenance issues or events. This includes all Holidays.
- Response Times for PSAPS in Maricopa Region and Pima County will be provided in a 90 minute (maximum) on-site response time.
- One (1) 800 Number is provided to all PSAP's for both 9-1-1 Network and Equipment repair issues. This also improves response times whereas the PSAP's do not need to call two different numbers to open a repair 9-1-1 call.
- If the issue that was called in cannot be resolved through our CENTURYLINK remote diagnostics and repair Network Operations Center (NOC), then a technician shall be on-site within the above stated response times.
- The CENTURYLINK 9-1-1 NOC has a call-answering objective of answering 90% of all 9-1-1 calls within 20 seconds.
- In the event that a system has failed completely, the 9-1-1 System Administrator shall be updated hourly by the Arizona 9-1-1 CENTURYLINK Service Manager, Account Team and or Network Operations Center.
- If the system is anticipated to be down longer than 24 hours, the State 9-1-1 Administrator and State 9-1-1 office shall be notified immediately.
- CENTURYLINK provides new and updated escalation list(s) to the PSAPs in our monthly and quarterly PSAP and State 9-1-1 meetings. The PSAP can escalate at any time to the local dedicated 9-1-1 CENTURYLINK account team and Area Operations personnel.
- To assure that quicker response times are met, CENTURYLINK maintains manufacturer-recommended maintenance components at twelve (12) local Arizona CENTURYLINK installation and maintenance facilities. Some maintenance spare parts are also housed at the 9-1-1 PSAP facility depending on the location and size of the PSAP.
- Remote VPN (Virtual Private Network) access is being implemented as part of our Managed Services that also improve(s) response times.

17.2 TROUBLESHOOTING:

Trouble Ticket Resolution and Coordination with Solution Partners/ Manufacturers:

- CENTURYLINK 9-1-1 NOC uses Solution Partners/Manufacturers Web-based portals to track all manufacturer related 9-1-1 equipment issues. These portals provide CENTURYLINK with a fast, easy way to communicate directly with the 9-1-1 equipment manufacturer's in real time. CENTURYLINK can prioritize the severity of the repair problem with each vendor.

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- The portals also allow CENTURYLINK to review and identify other 9-1-1 locations within the CENTURYLINK territories that are having some of the same or identical manufacturer repair issues.
- These online tracking site(s) will allow CENTURYLINK to get hourly, daily, or weekly Service Ticket Alerts via e-mail for additional tracking purposes. The Web-based service and support command center provides CENTURYLINK with a direct escalation process for open manufacturer issues.
- These sites also are used by CENTURYLINK to complete Return Material Access (RMA) and track on repair equipment if a part needs to be returned. Using CENTURYLINK to complete all of the problem tracking and follow up procedures eliminates the need for the 9-1-1 PSAP personnel to complete this task.
- The following steps are taken for escalation and coordination with our 9-1-1 Partners as outlined below:
 - Step 1 CENTURYLINK NOC Tier 2 support interfaces directly with our approved 9-1-1 equipment partners. A case ticket is opened through the online CENTURYLINK manufacturer portal. CENTURYLINK prioritizes the ticket as an escalation on the Web site and this is instantly marked high priority.
 - Step 2 - All of the high priority repairs are reviewed with the 9-1-1 equipment manufacturers hourly, daily, and discussed on weekly conference calls if required.
 - Step 3 - The PSAP is provided progress reports via e-mail updates, through conference calls and service meetings.
 - CENTURYLINK also is notified through Partners Product Bulletins and Notices of trouble solutions and resolutions from each Manufacturer that also will assist in getting the trouble ticket closed.
 - CENTURYLINK also provides Business Solutions Alerts of any Arizona 9-1-1 outages that may be caused from Cable cuts, Fiber cuts or equipment failures. The State 9-1-1 Administrator and State 9-1-1 office are notified along with the PSAP(s) affected of such outages via our Arizona 9-1-1 service manager.
- Step 4 – If it is determined that a patch or firmware upgrade is required from the Manufacturer, CENTURYLINK will keep the trouble tickets opened until final resolution of the ticket from the manufacturer.
- Step 5 – Repair is resolved. If a Patch or Firmware is needed it will be installed remotely.
- Step 6 – PSAP is notified of repair resolution and ticket is not closed with Partner until PSAP provides CENTURYLINK NOC or technician with authorization to close the ticket.
- Included in our Managed Services offering is monitoring and response from our 9-1-1 Managed Services Partners. If CENTURYLINK partners recognize a repair issue at the PSAP site through the remote monitoring process, the partner will open up a ticket with CENTURYLINK NOC. Same steps are followed for escalation and closure of ticket.
- CENTURYLINK 9-1-1 account teams can also view and track resolution during the repair process on the partner portal.

Feet-on-the-street support

- CENTURYLINK has been installing, maintaining, and servicing 9-1-1 CPE and Network for over 25 years in the State of Arizona. Over the past eighteen years, CENTURYLINK has planned, installed, and maintains over 70 PSAPs in Arizona for 9-1-1 equipment and network. Currently in Arizona, CENTURYLINK has dedicated certified 9-1-1 technicians strategically located in Northern and Southern Arizona. CENTURYLINK technicians are certified annually on any new product(s) by our 9-1-1 manufacturers. In addition to our dedicated 9-1-1 technicians, we also provide 9-1-1 network support on the current WAN/LAN IP and Digital networks.
- CENTURYLINK 9-1-1 technicians provide installation and maintenance support Seven (7) days per week, 24 hours per day, 365 Days per year to our 9-1-1 PSAP Centers.

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- Feet on the street support will be provided by CENTURYLINK 9-1-1 Technicians, Data Technicians, Network Technicians and CENTURYLINK Contractors. We also will provide System Design engineering if needed.
- CENTURYLINK provides local System Design and engineering support for 9-1-1 Network, Equipment and integration as part of our Managed Services offering as needed.

18.0 DOCUMENT REFERENCES

- 1 AZ NG9-1-1 Design (Rev 150921)
- 2 2014 Compliance Management Tearsheet
- 3 Savvis – 2013 Type 2 – SOC 1 Report
- 4 CIDB-AdditionalData Interface for A9-1-1_Version 1.1
- 5 ECRF-LoST Interface for A9-1-1_Version 1.1
- 6 ESRP Terminating Interface for A9-1-1_Version 1.0
- 7 LIS-HELD Interface for A9-1-1_Version 1.1
- 8 PBN-2013-Third Party IP-Recording Kit
- 9 Vesta SMS_PB 06-2014
- 10 PAD Datasheet

19.0 “AZ NG9-1-1 DESIGN” DOCUMENT – DRAWING TABS

Tab	Description
ESInet	Drawing showing the MPLS network that comprises the ESInet and includes: LSR to LNG LNG to ECMC ECMC to CPE Hosts – VIPER and VESTA
LNG	Drawing includes the major equipment and network design within the LNG Data Centers, showing route diversity and equipment diversity
VIPER MPLS	Drawing of the VIPER Host/Remote MPLS Network.
VIPER ECMC	Drawing of major components in West’s ECMCs including VIPER host and the West cloud
VIPER Remote	Drawing showing typical network connectivity to remote site with diverse PSAP and Central Office equipment. Local loop will be redundant and not diverse, meaning, all in one sheath or trench. Includes typical VIPER equipment to be installed in each PSAP backroom.
VIPER Workstation	Drawing of VIPER workstation equipment with handoffs to recorder and radio (for headset integration)
VESTA MPLS	Drawing of the VESTA Host/Remote MPLS network
VESTA Host	Drawing of VESTA Host sites, showing the major equipment and network design within the VESTA Host Data Centers, showing route diversity and equipment diversity
VESTA Remote	Drawing showing typical network connectivity to remote site with diverse PSAP and Central Office equipment. Local loop will be redundant and not diverse, meaning, all in one sheath or trench. Includes typical VESTA equipment to be installed in each PSAP backroom
VESTA Workstation	Drawing of VESTA workstation equipment with handoffs to recorder and radio (for headset integration)