

Managed Emergency Call Handling VIPER Service Guide

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1.0 INTRODUCTION

This Service Guide describes Lumen's VIPER Managed Emergency Call Handling Solution (MECH).

"Lumen" is defined for purposes of this Service Guide as CenturyLink Communications, LLC d/b/a Lumen Technologies Group or its affiliated entities providing Services under this Service Guide. Any references to "CenturyLink" and "Lumen" may both occur and mean the same.

2.0 SOLUTION OVERVIEW

VIPER Managed Emergency Call Handling services offering is a configuration of specialized NG9-1-1 Customer Premises Equipment (CPE) and NG9-1-1 Call Management applications deployed in a Hosted Geo Diverse multitenant architecture and provisioned to serve multiple customer Public Safety Answering Points ("PSAPs"). The PSAPs can be distinct agencies, onboarding to the shared platform at distinct points in time.

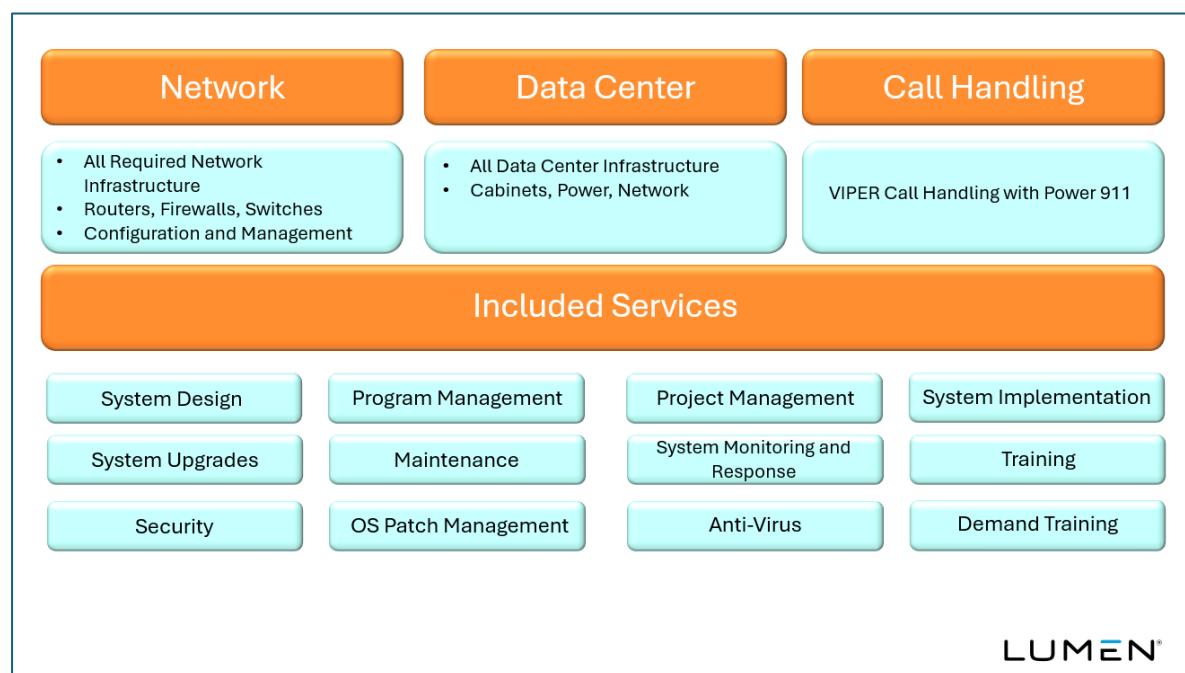
VIPER Core Call Processing, ALI Controllers, and Management servers reside in Lumen Data Centers; VIPER Call Taker CPE sits in the PSAP. Management of the Call Taking equipment is provided through the host over a dedicated Virtual Private Network (VPN).

The Services will support up to 150 call handling endpoints (Power 911 positions, optional IP phones) on a given multi-node VIPER instance. Lumen will deploy additional multi-node VIPER core instances for the next bank of 150 positions.

The Services will use current mainstream releases (VIPER v7.1 or later, Power 911 v6.4 or later).

3.0 VIPER MECH BUNDLE – INCLUDED SERVICES

Lumen's Managed Emergency Call Handling Solution



3.1 Included: VIPER Call Handling Feature Set

Services use the following mainstream releases: VIPER v7.1 or later paired with Power 911 v6.4 or later.

Power Station™ Gen3 call handling stations at the PSAP positions functionality is as published by Intrado for Viper and Power 911 releases (Product Bulletins and User Guides).

3.2 Included: Satellite VIPER Node (“SVN”)

- SVN (at PSAP location)
- SVN with dual soft switches for enhanced survivability of local call flows in the event of loss of connectivity with Core Equipment facilities.

3.3 Included: Sentry Monitoring & Response

- Included in per seat pricing
- Use the following mainstream release: Sentry v2.2 SP2 or later
- Core equipment equipped with Sentry Server Console (Sentry-based monitoring)

3.4 Included: Patch Management and Anti-Virus

- Included in per seat pricing
- The service leverages Intrados’ Customer Care Access

3.5 Included: Lumen Services

Lumen provides a fully dedicated team to support all VIPER MECH customers. The Lumen team includes staff performing the following functional roles and responsibilities:

- Program Management – Manager Technology Management
- Project Management – Lead Project Managers
- NOC Surveillance – Operations Technicians
- Technical Support, engineer design, lifecycle – Sr Lead and Lead Engineers
- Service Manager, Carrier Manager – Sr Network Analyst
- Reporting, SLA, Record, Inventory, Training – Analyst II

Lumen provides the VIPER MECH Service with the following design, implementation, training, security, management, and maintenance services:

- System Design
- System Configuration
- System Application Change Management (Example: Adding or removing users)
- System Implementation
- System Upgrades
 - Lumen will upgrade VIPER major release software at a minimum once per year.
 - If Core Equipment or PSAP Equipment needs to be upgraded or replaced to support release software
- System Maintenance (Includes preventative maintenance)
- All new systems include the following training
 - Administrative Training on VIPER and Power 911
 - User Training on VIPER Power 911 or Train the Trainer so PSAP can provide their user training
- System Training – Refresher & Demand (Webex)
- System Monitoring and Response
- 7 x 24 x 365 Staffed Network Operations Center
- Security – Lumen Secure Access Service Edge (SASE)

- VPN Access, Firewall, Malware scanning

3.6 Included: Lumen's Public Safety CPE ESInet for VIPER 9-1-1

- Lumen provides network connectivity between PSAPs and Host VIPER over a secure private network.
- Lumen's carrier grade MPLS network provides all layer 3 connectivity between VIPER Core Multi-node hosts and remote PSAP VIPER Positions.
- Local access to PSAP from the Lumen Private MPLS backbone can be delivered over a variety of transport types.

This can include:

- Ethernet Local Access (ELA) – Supports up to 1G
- Wave Local Access (WLA)
- Layer 2 and Layer 3 Connectivity between Data Centers – Ethernet or Optical Wave Service

Lumen or its vendor Intrado provides all appliances for router, firewall, core and VIPER switches at the core data centers and PSAP locations to secure the provided managed services network. Customer is responsible for securing its own network edge which will not be included in this option (for example when integrating into customer provided logger or LAN to support admin SIP or management).

3.7 Included: Lumen Tier 3 Data Centers

Lumen provides Tier 3 Data Centers for hosting VIPER Multi-node Core CPE.

4.0 VIPER MECH – OPTIONAL ADD-ON APPLICATIONS and COMPONENTS

Lumen provides the following VIPER applications and components at an additional MRC. Some of these applications/ components may also include an NRC at startup.

4.1 VIPER Applications

4.1.1 Optional Add On: PowerOps

PowerOps uses the following mainstream release:

- PowerOps v1.1 or later

PSAPs who desire to configure VIPER ACD must also opt for at least one (1) PowerOps display per PSAP.

Not Included: Large Display. Customer may provide their own large display or Lumen can provide pricing and provide a large display upon customer request.

Functionality is as published by Intrado for these releases. Intrado Product Bulletins and [Service Guides](https://www.intrado.com/legal-privacy/terms-conditions/call-handling) are incorporated herein and are found at <https://www.intrado.com/legal-privacy/terms-conditions/call-handling>.

4.1.2 Optional Add On: Power Metrics Advanced

Power Metrics Advanced uses the following mainstream release:

- Power Metrics

Functionality is as published by Intrado for these releases. Intrado Product Bulletins and [Service Guides](https://www.intrado.com/legal-privacy/terms-conditions/call-handling) are incorporated herein and are found at <https://www.intrado.com/legal-privacy/terms-conditions/call-handling>.

4.1.3 Optional Add On: TXT29-1-1

TXT29-1-1 uses the following mainstream release:

- TXT29-1-1

Functionality is as published by Intrado for these releases. Intrado Product Bulletins and [Service Guides](#) are incorporated herein and are found at <https://www.intrado.com/legal-privacy/terms-conditions/call-handling>.

4.1.4 Spatial Command and Control (SCC) - with Data Update service

SCC is a browser-based location mapping that displays real-time actionable data to provide critical situational awareness occurring in the immediate environment of an incident.

Two (2) data updates are included with SCC, whereby Intrado GIS Ops performs data updates for the customer.

4.1.5 Text2911 Translation

The Intrado text translation solution is integrated into the existing Power 911 call taking user interface. It automatically detects the Incoming language of the text send to the PSAP And provides real-time translation of text messages for a wide variety of languages.

Languages supported are:

Afrikaans	Dutch	Irish	Mongolian	Swahili
Albanian	English	Italian	Nepali	Swedish
Amharic	Estonian	Japanese	Norwegian	Tamil
Arabic	Filipino	Javanese	Pashto	Telugu
Armenian	Finnish	Kannada	Persian	Thai
Azerbaijani	French	Kazakh	Polish	Turkish
Basque	Galician	Khmer	Portuguese	Ukrainian
Bengali	Georgian	Korean	Punjabi	Urdu
Bosnian	German	Lao	Romanian	Uzbek
Bulgarian	Greek	Latvian	Russian	Vietnamese
Burmese	Gujarati	Lithuanian	Serbian	Welsh
Catalan	Hebrew	Macedonian	Sinhala	Zulu
Chinese	Hindi	Malay	Slovak	
Croatian	Hungarian	Malayalam	Slovenian	
Czech	Icelandic	Maltese	Somali	
Danish	Indonesian	Marathi	Spanish	

4.1.6 PSAP Initiated Multimedia

PSAP Initiated Multimedia provides the PSAP with the capability to initiate a live video streaming session with any wireless administrative line or 911 caller. PSAP Initiated Multimedia allows the caller to share a video stream of the emergency with the PSAP call taker and then displays the video (if selected) on the Integrated multimedia panel in the Power 911 call handling user interface.

Functionality is as published by Intrado for these releases. Intrado Product Bulletins and [Service Guides](#) are incorporated herein and are found at <https://www.intrado.com/legal-privacy/terms-conditions/call-handling>.

4.2 Optional VIPER Add-On Hardware and Licensing

- VIPER Gateway Shelf
- Admin Interface Module (AIM)
- CAMA Interface Module (CIM)
- 48V Power Supply Module
- Mediant 1000B Prebuilt Building Block
- Mediant 1000 Spare Part Digital Voice Module Single Span

- Mediant 1000 Access License (per chassis)
- SNOM Admin Phones
- 3rd Party Recording Kit (License to connect Non-Intrado Recording)
- 3rd Party SIP Interface
- ECCP Workstation License
- 24 Button External Keypad
- 48 Button External Keypad
- KVM – 2 Port
- KVM – 4 Port
- Touch Screen Monitor
- Viper Session Border Controller (SBC)
- Viper Advanced Firewall

4.3 Other Optional Add-On Equipment and Services

If the customer has a special need for equipment and/or services not listed above, Lumen can provide this equipment and/or service at a monthly recurring charge (MRC) upon customer request. Lumen will retain ownership and provide all repairs and replacement of defective equipment for the term of the contract. Any customer requests will be configured to meet the specific need of the PSAP. Therefore, Lumen will generate ICB (Individual Case Bases) pricing for any customer request(s).

Examples of equipment would include:

- PSAP front or backroom UPS
- Non-standard sized monitors
- Additional Time Sync devices

Examples of services would include:

- Back and front room network cabling
- Electrical
- Removal of decommissioned equipment

5.0 ARCHITECTURE

5.1 High Level Design

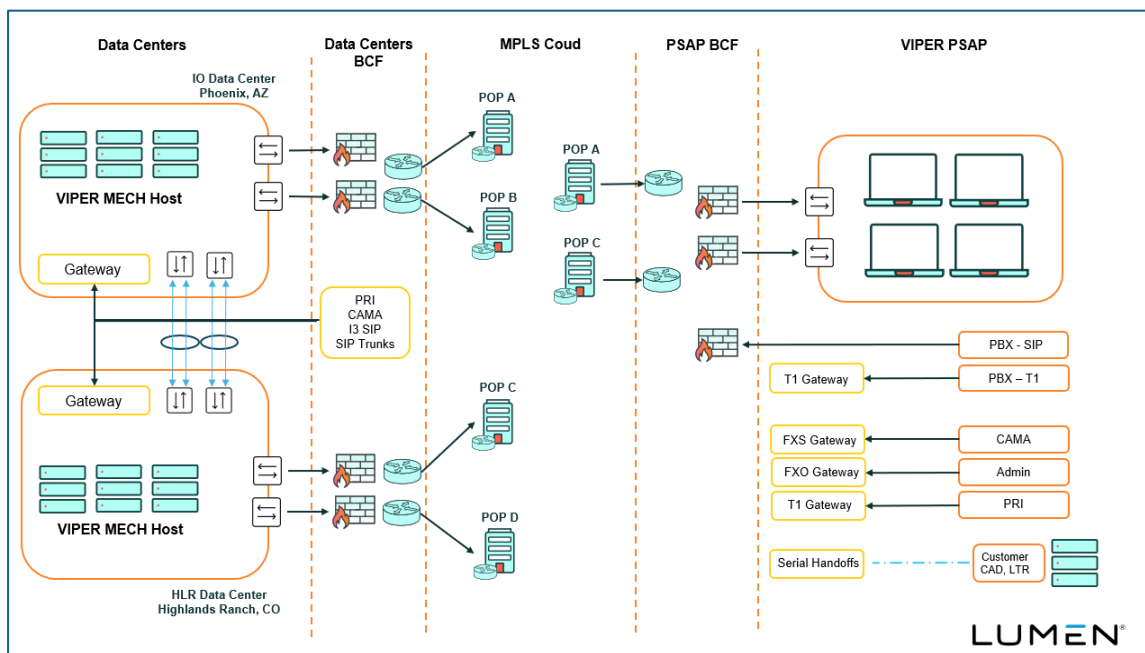


Figure 5.1 – High Level Solution Design

5.2 VIPER Core Equipment

VIPER is deployed in a Geo Diverse Multi-node configuration. Node A resides at one physical data center and Node B resides at a second geo-diverse data center. VIPER nodes are deployed to run in active-active mode. Each VIPER node has a local set of redundant servers for added resiliency.

Lumen is responsible for all preventative maintenance activities on all VIPER Core Equipment, including software management. Lumen will refresh Core Equipment every seven (7) years or sooner if required. VIPER Host equipment is deployed as a Geo-Diverse multitenant system. The Lumen MECH Solution includes the following as required for each host data center:

- Co-Location Space for host system components
- All racks and power requirements
- VIPER and Power 911 Application Servers
- Network Management Server
- Master Time Clock – Each host system
- Peripherals – KVM and monitors
- Backup Devices
- LAN switches
- Routers
- Patch Panels
- All cabling

5.3 PSAP VIPER CPE

- PSAP may order services for up to 150 PSAP front-room positions serviced from each multi-node VIPER system instance.
- Lumen/Intrado will own all PSAP CPE.
- If PSAP CPE must be repaired, Lumen will repair or replace the PSAP CPE during the service contract term.
- Lumen is responsible for all preventative maintenance activities on-site, including software management.

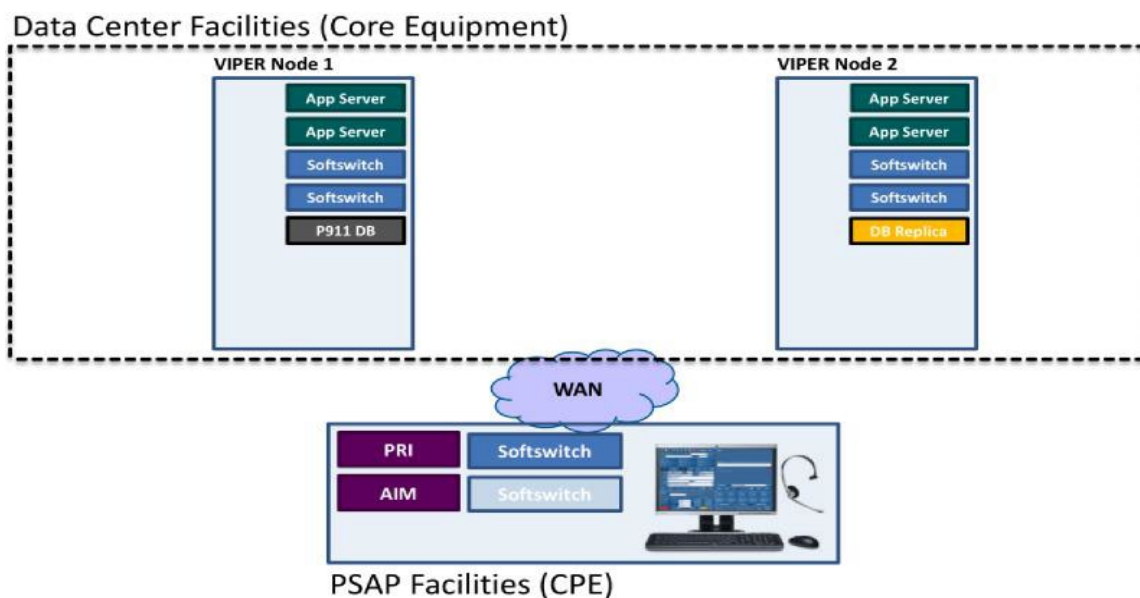


Figure 5.3 – Viper CPE

5.4 Lumen's Public Safety CPE ESInet for VIPER 9-1-1

Provides network connectivity between PSAPs and Host VIPER over a secure private network.

- Lumens carrier grade MPLS network provides all layer 3 connectivity between VIPER CPE hosts and PSAP remote VIPER CPE.
- Supports all Intrado network requirements.
- Local access to PSAP from the Lumen MPLS backbone can be delivered over a variety of transport types. This can include:
 - Ethernet Local Access (ELA) – Supports up to 1G
 - Wave Local Access (WLA)
 - Layer 2 and Layer 3 Connectivity between Data Centers – Ethernet or Optical Wave Service

5.5 Core Network (VIPER Core ESInet)

Lumen deploys a secure, private, and fully diverse network within the VIPER core infrastructure utilizing the Lumen Private Port MPLS (Multiprotocol Label Switching) and OWS (Optical Wave Service) networks. All Core MPLS and OWS circuits are deployed on Lumen provided fiber.

Lumen will install diverse Private Port MPLS circuits at each data center, which provides the connectivity from the VIPER Host to the VIPER MPLS cloud for remote PSAP connectivity. Network design for VIPER host data centers exceeds five-9s (99999) of reliability.

5.6 Data Centers

All NG9-1-1 Managed Hosted PSAP CPE equipment will be installed in physical secure cages provided by Lumen. Access to these data centers is strictly controlled. Only Lumen authorized 9-1-1 support teams will have access to cages where hosted CPE equipment is located.

5.6.1 Data Center Infrastructure Included:

- All required network extensions from data center carrier “meet me rooms” to Lumen CPE cages
- All equipment cages and racks
- Power and UPS
- Backup Power and UPS
- Network Timing Solution
- Premium Level Data Center Support
- All installation and maintenance

5.6.2 Data Security

5.6.2.1 Physical Security

All solution data is stored and backed up in Lumen data centers. Primary storage and backup devices are placed in Lumen secure cages. Access to these secure cages is limited to authorized Lumen 911 support teams only. All vendors must be escorted by Lumen 911 technicians.

5.6.2.2 Data Backups

Lumen backs up all system and customer data as required by manufacturers' best practices. Backup devices are installed and located at each data center to ensure data preservation. Only authorized Lumen 911 support teams and manufacturers can physically access these devices and the data contained on the devices.

5.6.2.3 Data Access

All customer (PSAP Customer) data is stored in separate security domains, or sites, and each PSAP Customer can only access that PSAP Customer's own data. However, with proper authorization from each PSAP Customer, permission may be configured to grant other agencies or entities access to the PSAP Customer data. This may be useful when a State or regional entity requires access to all PSAP Customer MIS data. Lumen will obtain permission from each PSAP Customer prior to granting other agencies or entities access to the PSAP Customer data for compliance with government requirements. Only after Lumen receives permission from the PSAP Customer will Lumen configure the permissions for other entities to access the applicable PSAP Customer data.

5.6.3 Data Center Network

Lumen will provide two fully diverse 1G MPLS over WLA (Wave Local Access) for all routed layer 3 ingress/egress traffic at each data center for VIPER 9-1-1.

Lumen will provide four 1G OWS circuits for layer 2 connectivity between data centers. These circuits are configured in two separate link aggregation pairs and each pair is fully diverse.

VIPER ESInet – All VIPER host to remote traffic is routed over a pair of diverse 1G MPLS circuits at each data center.

Data Center to Data Center Connectivity – Lumen deploys a pair of diverse link aggregated layer 2 OWS circuits for Data Center to Data Center Connectivity.

5.6.4 In Production Data Center Locations

Lumen has two data centers deployed and in production

- **Data Center 1:** IO Data Center – Phoenix AZ
- **Data Center 2:** Highlands Ranch Data Center – Highlands Ranch CO

911 traffic is delivered to these two data centers over the Lumen i3 NGCS ESInet. The i3 NGCS ESInet terminates at each data center where it passes calls into the Lumen Managed Emergency Call Handling solution.

The Lumen i3 NGCS ESInet is not part of the Managed Emergency Call Handling Solution. Lumen can provide a bundle offering at customers request.

5.6.5 Optional Data Center Deployments

Optional regional data center deployments will be considered. Building any new data center infrastructure will be done at an additional cost to the customer. Depending on deployment model and committed seats, Lumen may cover part or all of the data center infrastructure build.

5.7 PSAP Network (VIPER Remote PSAP ESInet)

Each VIPER remote site will be served by a pair of redundant Private Port MPLS circuits. Remote PSAP network design will meet five 9s reliability. Upon customer request, Lumen can provide pricing for local, last mile diversity.

With Lumen MECH, Lumen will provide all connectivity from the PSAP to the Lumen CPE NG9-1-1 ESInet. Providing a resilient, diverse or redundant connection from Lumen MPLS POPs to the PSAP is very dependent on the existing local service providers' network. Lumen will make every attempt to ensure that there is a minimum redundant set of circuits from a pair of PRIV routers at Lumen POPs through the LEC network to the PSAP.

Where diversity or redundancy is not present, Lumen will advise customer of design limitations and optional solutions. All costs for deploying an optional solution would be the customer's responsibility.

- Drawing 5.7a – Lumen preferred design
- Drawing 5.7b – Only 1 Meet Point is available
- Drawing 5.7c – Only 1 Meet Point and Lumen POP is available.

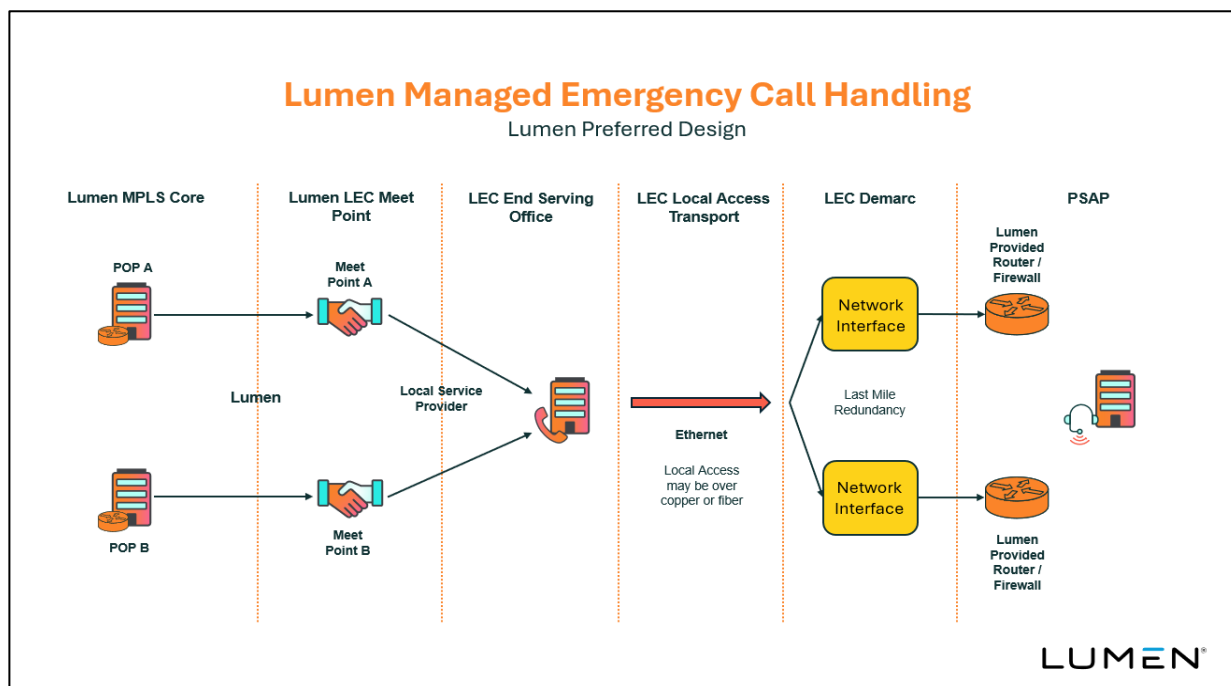


Figure 5.7a

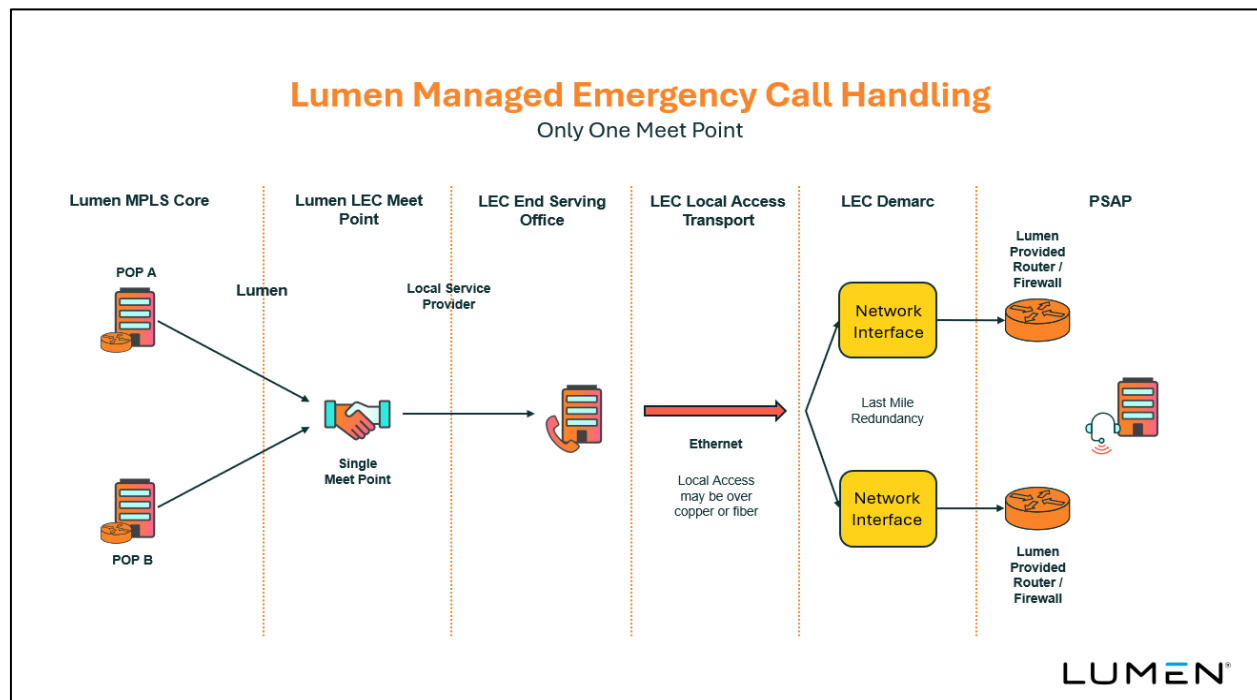


Figure 5.7b

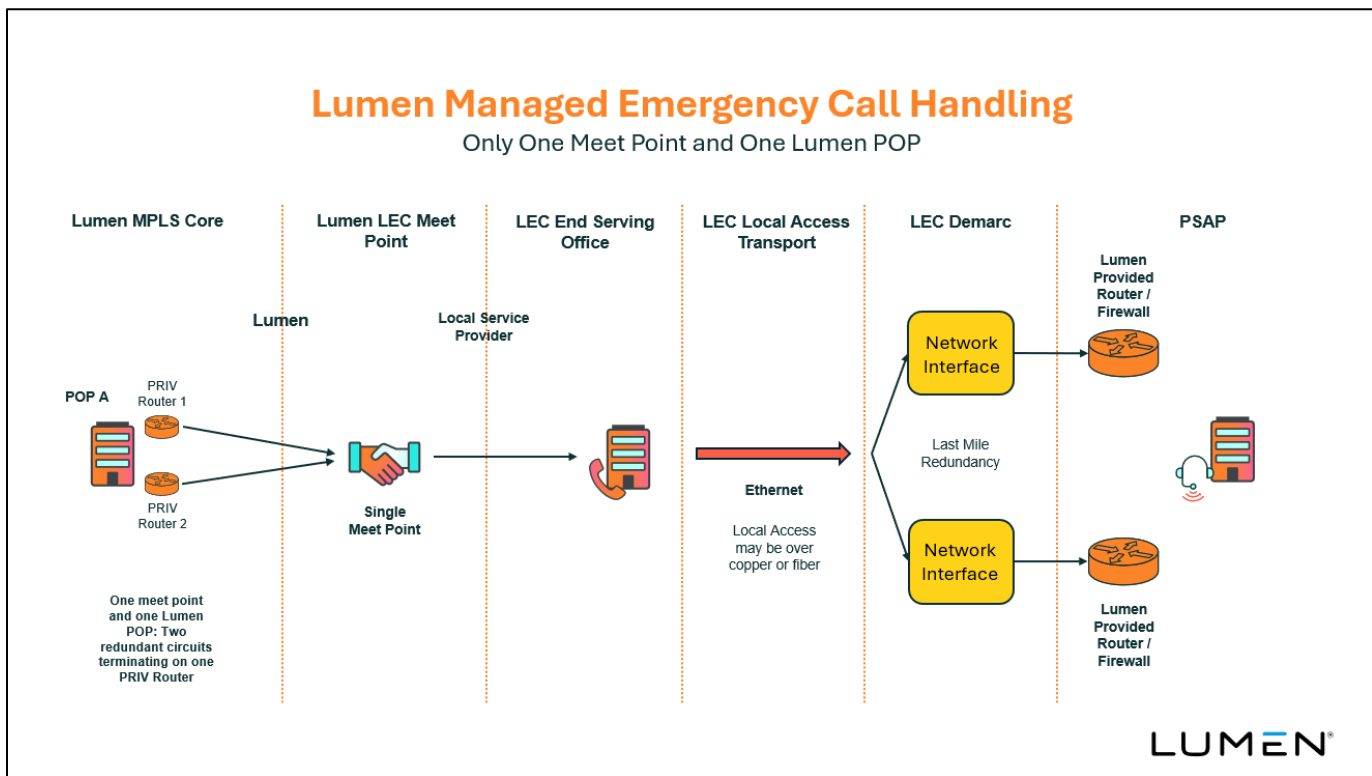


Figure 5.7c

5.8 PSAP Bandwidth

PSAP bandwidth is dependent on several variables that Lumen will consider during PSAP design. The variables that need to be considered include, but may not be limited to:

- Position Count
- Conferencing
- On-Net Transfers
- Roaming or Hot Seating
- Admin Lines – including termination points
- Content Services (Rich Media, Video, Sensor Data, etc.)

All of the above services can impact the number of Concurrent SIP Sessions (CCS) and bandwidth requirements. PSAP bandwidth needs to be sized to handle the number of CCS and overhead for system applications, control, and management.

5.9 Legacy E9-1-1 and NG9-1-1 Core Services

Lumen's Managed Emergency Call Handling Solution does not include legacy E9-1-1 service or NG9-1-1 i3 Core Services. Lumen provides all CPE hardware and CPE configuration services where customer's E9-1-1 services and/or NG9-1-1 services will terminate.

5.9.1 Legacy E911 Services

E9-1-1 CAMA trunks may be installed to one or both VIPER Equipment Cores or directly to the PSAP, terminating on VIPER CAMA Interface Modules (CIM). Legacy ALI circuits must be installed on the VIPER Core Equipment. The customer is responsible for all costs to extend their Legacy E911 Services to the VIPER data centers and Core Equipment Cabinets within the data centers.

5.9.2 PSAP NG911 Core Services

Any customer NGCS ESInet may be connected to the VIPER Managed PSAP solution if the ESInet provider has been certified to work with VIPER NG9-1-1 systems. Customer is responsible for all costs to extend their NGCS ESInet to VIPER data centers and Core Equipment Cabinets within the data centers.

Lumen offers NG911 Core Services with existing connectivity into the VIPER Core datacenters. Lumen can provide optional pricing for these services upon customer request.

6.0 SYSTEM CONFIGURATION, INSTALLATION, MAINTENANCE

Position Hardware installation is included with per seat pricing.

Responsibility Matrix

Task / Service Attribute	Responsible Party
Project Management	Lumen with PSAP Support
Project Plan	Lumen
System Architecture	Lumen / Intrado
Network Architecture – WAN/Transport	Lumen
Network Architecture – VIPER CPE LAN at PSAP	Lumen / Intrado
Core Equipment facilities (Data Centers)	Lumen
PSAP Facilities	PSAP
PSAP Facility Site Preparation (floor space, power, etc.)	PSAP
PSAP Facility Project Survey for PSAP CPE	Lumen / PSAP
Project Survey Analysis and Report	Lumen
Project Survey Guideline and Documentation	Lumen
Site Readiness as addressed in Project Survey Analysis and Report	PSAP
PSAP Data Collection, Configurations/Lists-Star Codes, Transfer, Contact List, etc.	Lumen / PSAP
Receiving and unloading equipment shipped to Lumen Core Data Centers	Lumen
Receiving and unloading equipment shipped to Lumen Core Data Centers	Lumen
Core Equipment install and maintain at host	Lumen
Provide, monitor, and maintain facilities for Core Equipment	Lumen
PSAP CPE – Install and maintain at PSAP facility	Lumen
Core Equipment – Stage, configure and ship	Lumen / Intrado
PSAP Equipment – Stage, configure and ship	Lumen / Intrado
Training	Lumen

Pre-production and end-to-end testing	Lumen / PSAP
Develop migration plan and execute migration testing	Lumen / PSAP
Service production turn-up	Lumen / PSAP
Monitoring, maintenance and operational technical support for all elements of Core Equipment and PSAP CPE	Lumen
Network monitoring and maintenance	Lumen
Upgrades	Lumen
Log storage and backups	Lumen
Problem reporting	Lumen
Tier 1 problem triage and resolution	Lumen
Tier 2 problem triage and resolution	Lumen / Intrado
Network capacity management	Lumen
MPLS network capacity management	Lumen

6.1 Intrado VIPER Network Requirements – Lumen Network Compliance

Lumen's MPLS and OWS networks meet and exceed all Intrado published network requirements. Lumen's network will meet the following requirements:

- ☐ Layer 3 routing will be provided between all locations.
- ☐ Certified CAT5e/CAT6 between all network switches.
- ☐ Guaranteed Bandwidth for all VIPER applications-Bandwidth requirements for each PSAP deployment.
- ☐ Low Latency (< 40ms desirable);
- ☐ Low Jitter (< 5ms desirable);
- ☐ Support for Quality of Service ("QoS") as needed.
- ☐ Security against intrusion and virus attacks.
- ☐ Reliable links (fault tolerant)-no single point of failure may cause a Layer 3 disruption for more than four seconds

Lumen will provide all network communications equipment, including redundant IP routers, switches, firewalls, etc. to terminate the dual MPLS circuits at the PSAP location. Lumen will also provide all network communications equipment, including redundant IP routers, switches, firewalls, etc. to terminate the dual MPLS circuits at the location of the Core Equipment.

6.2 PSAP CPE

Lumen and Intrado will retain ownership of all PSAP CPE. The PSAP is responsible for damage to PSAP CPE equipment caused by the customer, however, reasonable wear and tear is expected from standard use of the equipment during the time in which it was deployed.

6.3 Call Ingress and Location Methods

A variety of methods can be selected for call delivery and location. Pricing is based on RFAI call delivery environment with legacy ALI and will need to be modified for other environments.

6.3.1 Other Delivery Environment

Services can support operation in a legacy delivery environment:

- Receive a voice emergency call via RFAI (SIP)
- Query an ALI Database for location

6.3.2 i3 Delivery Environment (priced upon request* see note)

Services can also support i3 functions and protocols. As defined within the NENA i3 Reference Architecture, and subject to pre-production interoperability testing, NENA i3 Services will support the ability for the PSAP to:

- Receive a voice emergency call with SIP/PIDF-LO
- Query the ECRF for emergency responder information using the LoST protocol
- Query a CIDB to obtain additional caller information data
- Query a LIS to obtain updated information during a call using the HELD protocol
- Receive/display text emergency call information with PIDF-LO
- Query and display enhanced data information on the PSAP workstation

* Note: Regarding “Pricing upon request”, VIPER software and licenses are included, however; delivery design may drive additional costs, generally in relation to network connectivity.

6.3.3 Legacy Delivery Environment (CAMA/ALI) (priced upon request)

Services can support operation in a legacy delivery environment:

- Receive a voice emergency call via CAMA
- Query an ALI Database for location

6.4 System Configuration

This section addresses configuration of the VIPER Services

6.4.1 VIPER Configurable Attributes

- Lumen will use a standard project survey collection form to support the information required to configure Services for each PSAP.
- Lumen and the PSAP Customer will complete a list of configurations for each PSAP in accordance with the detailed project plan.

6.4.2 Services Configuration

6.4.2.1 Lumen / Intrado Responsibility

Lumen and Intrado will support a comprehensive system configuration in conjunction with system administrator training and using the Customer Configuration Service (CCS). CCS is a configuration tool designed to understand PSAP operational practices and call flows and joint participation with the PSAP to configure its own Power 911 system. A completed configuration will be uploaded as part of the staging process.

Administrator training on the CCS is included and is a one (1) day course. (Note that ACD design session - if used - is conducted at the same time as the CCS training and encompasses one additional day of administrator training.)

The CCS is currently a DVD, which includes Power 911 Admin and User Guides, ACD configuration information (used for ACD sites), VMware Player, CCS Virtual Machine, and instructions on how to install the VMware player and CCS Virtual Machine. This DVD may be used by Channel Partners or the PSAP Customer on its own computer to create the configuration for the PSAP's Power 911 workstations that can later be used in staging.

6.4.2.2 Lumen Responsibility

The PSAP Customer will provide Lumen with support, as needed, to gather the call distribution configuration requested for each PSAP, including ring group or ACD preferences, and rollover tiers.

The PSAP Customer will support Lumen as needed to gather a complete list of configurations for each PSAP. These PSAP configuration lists include:

- Power 911 profile configurations, including screen layout, agency access, transfer profiles, etc.
- Current ALI and NRF response formats

Once installed, a Lumen Intrado-certified technician can then input the customer required configuration in the virtual environment and then export the saved configuration file in a format that can be imported into the production environment.

As an output of CCS, a Lumen Intrado-certified technician, or smart hands, will configure the ACD Services based on each PSAP's preference for distributing voice calls.

A Lumen Intrado-certified technician will configure the ACD, at the PSAP request, to distribute 9-1-1 voice calls based on the longest idle time, fewest completed calls, or round-robin. PSAPs who elect to configure ACD must also opt for at least one PowerOps server per PSAP.

Alternately, a Lumen Intrado-certified technician will configure ring groups if the PSAP requests to distribute 9-1-1 voice calls to all available call takers.

Each ring group or an ACD queue can be configured with an alternate destination that is either another ring group or an ACD queue (rollover tier) for various situations. An agent can be a member of one or more ACD queues; a workstation can be a member of one or more ring groups.

6.4.3 PSAP Management Gateway, Profile

PSAP Customers will not have access to the VIPER PSAP Management Gateway. For each PSAP, the Power 911 configuration will be set up as a "square" system, meaning that all positions will be presented with the same profile, including screen layout, agency access, transfer profiles, etc. Lumen will be responsible for configuration changes for the PSAP once deployed.

6.4.4 PSAP CPE

Lumen will provide PSAP CPE, including Power Station Gen3 workstations, backroom servers, peripheral, hardware, and local LAN switches at each PSAP Customer Facility. Lumen is responsible for the installation and support of PSAP onsite Services equipment.

Lumen will conduct a Project Survey used to collect customer site data in accordance with two principles: 1) collecting data from site elements (both physical and operational) that are in place at the time of the survey and 2) new elements

that will be used within the scope of the project. Based upon the Output of the Project Survey and Analysis Report, Lumen, in collaboration with each PSAP Customer will determine the appropriate location for the Intrado PSAP CPE.

Lumen will conduct a project survey at each PSAP Facility. During the project visit, Lumen will assess the PSAP Facility compliance against Services facility requirements and will consult with the PSAP Customer on alternatives and any necessary site changes.

Lumen will provide, install, and maintain new LAN connectivity within each PSAP facility for interconnectivity between the Power 911 workstations. Interconnectivity between the Customer provided LAN and/or the Public Internet is not supported.

Customer will provide and install all cabling to interconnect between position equipment and equipment room components. Upon request, Lumen can provide a quote and perform these services for the customer or PSAP Customer at an additional cost.

Lumen will engineer Services interconnection with auxiliary equipment, such as CAD and CDR ports per applicable NENA Standards. Lumen will provide post-deployment support of interconnections. The CAD interface is the industry standard RS232C serial interface specification and follows NENA Standard NENA 04-001.

PSAP CPE is privately managed and closed to all third-party software applications (any software not provided by Lumen) and internetworking.

6.5 General Facility Requirements

6.5.1 PSAP Responsibility

Each PSAP facility will provide, at minimum, a 1000VA Uninterruptible Power Supply ("UPS") for networking and server equipment at the PSAP. Each workstation must be protected with a 650VA UPS or equivalent.

Lumen will notify each PSAP Customer if they must provide Lumen / Intrado with the following:

- Security access to each PSAP facility for Intrado personnel or authorized agents
- Ability to freely access all appropriate areas within each PSAP facility
- Parking and building access to move tools and equipment in and out of the facilities
- Secured storage for Intrado-supplied equipment shipped to the PSAP facility in preparation for installation
- Trash and/or recycling removal as needed, including disposal of system packing materials.
- Safe, locked, and limited access to equipment room, including adequate security to prevent theft of computer equipment, tools, test sets, and employees' personal effects
- Working space, access to computers and other technology, telecommunications equipment, and any other services and materials that may be reasonably necessary.
- 24 x 7 access for problem isolation

6.5.2 Equipment Room

6.5.2.1 Lumen Responsibility

For most PSAPs, PSAP CPE located in the equipment room will be installed in one standard 19" data cabinet. Within some of the larger PSAPs, CPE may require an additional standard 19" data cabinet.

6.5.2.2 PSAP Responsibility – Backroom Equipment

PSAP will ensure that each PSAP equipment room where the Lumen – provided communications equipment rack is located meets the following requirements:

- 24”x 87” of floor space for a Intrado-provided cabinet measuring 24”x 39”
- Floor space within 20 feet of the main telecommunications demarcation point
- 24” of space in front and behind the rack
- 36” between the end of the racks and the wall
- The floor must be capable of supporting 104 pounds per square foot
- Dry, clean, and well ventilated
- Well lit, easily accessible and free from excess vibrations
- The equipment rack should be in an area that does not receive consistent building traffic

In most cases, the backroom PSAP CPE provided by Lumen will be housed in one standard 19” data cabinet.

If the PSAP Customer wants to place PSAP CPE into a pre-existing rack, Intrado requires a minimum of nine (9) contiguous rack units of rack space in a single rack, depending on PSAP configuration. Lumen will provide the number of contiguous rack units required to the PSAP after completion of the site survey and configuration requirements.

PSAP will provide power, ground, and environmental controls for the PSAP CPE to be installed in the equipment room at each PSAP as follows:

- Two (2) dedicated 110 volt /20 AMP power feeds are required with A & B feed (separate power source) with receptacle for plug type NEMA L5 20P twist lock
- Any metallic component that is part of the PSAP infrastructure (such as equipment, racks, ladder racks, enclosures, cable trays, etc.) must be bonded to the grounding system
- The facility will have adequate HVAC controls, monitoring and redundancy to maintain:
 - Cooling for maximum heat output under full load is 4,000 BTU/hour
 - Data Center HVAC systems must maintain a constant dry bulb temperature between 68- and 77-degrees Fahrenheit
 - Relative humidity between 40% and 55%
- Surge/Lightning Protection

6.5.2.3 PSAP Responsibility – Front Room Equipment PSAP will need to provide the following space for each Power Station Gen3 station:

- Appliance dimensions are 3”/7.7 cm (Height) x 8”/20 cm (Width) x 10”/25 cm (Depth) (2U metal enclosure).
- 18” x 10” x 21” on the desktop for each monitor.

The PSAP Customer will provide power, ground, and environmental controls for the Power Station Gen3 to be installed at each PSAP facility as follows:

- HVAC: Each call taker and supervisor Power Station Gen3 position with two (2) 21” Monitors will dissipate a maximum of 1950 BTUs per/hour.
- A minimum of two (2) 15-ampere circuits to provide diverse power for the Power Station Gen3 station. Each circuit must be wired to an individual 15-ampere circuit breaker. Each circuit must provide two (2) fourplex outlets with individual hot, neutral, and ground wires. One 15-ampere circuit can support up to three (3) Power 911 positions. Customer must distribute workstations evenly across circuits.
- Additional circuits may be required for other non-emergency equipment.
- Each position should be prepared with two (2) (4 x 120 VAC) outlets as follows:

- Two (2) power receptacles for monitors.
- One (1) power connector for the PC (NEMA 5 15P).
- One (1) power receptacle for speakers (for Power 911 ringing)

6.6 Interconnectivity with Third Party Vendor Systems

When installation of third-party vendor systems requires coordination with Lumen technicians, Lumen will make all reasonable efforts to work with the PSAP to schedule a mutually agreeable time to complete the work. Lumen will not provide, install, maintain, or support cabling to connect any components provided by third party vendors. The Lumen Project Manager will include this work in the overall project plan and provide coordination.

During the installation of the PSAP CPE, the PSAP Customer will make all reasonable efforts to have an authorized third-party vendor technician, whose equipment will interconnect with PSAP CPE, on site during the installation.

If applicable, the PSAP Customer will ensure that a PBX technician is available to work with Lumen to make sure that all the phones work together and configure the PBX to interface with the Lumen PSAP CPE.

The PSAP Customer will provide, install, maintain, and support all cabling to interconnect between any components provided by third party vendors and the Power 911 systems. This includes connectivity to CAD and the Radio system, if any. Interconnection between the Power 911 system and any third-party component that uses an IP interface is not currently supported.

The PSAP Customer will work with the CAD system to implement any programming changes required in the CAD system. Lumen Call Handling Service serial interface follows the NENA 04-001 Section 3.4 standard.

6.7 PSAP Training

6.7.1 Lumen Responsibility

Lumen will provide on-site training for PSAP Call Takers/Dispatchers and Administrators.

6.7.2 PSAP Responsibility

The PSAP Customer will provide facilities for each on-site training session. Lumen will schedule any on-site training, after the Power 911 equipment has been installed and configured at the designated training location.

The PSAP Customer is responsible for identifying the PSAP Customer training attendees and ensuring they attend the Lumen-provided training. The PSAP Customer will provide Lumen with a complete list of attendees and their position for each training session a minimum of five (5) business days prior to the start date for each training session. Each PSAP Customer is responsible for training additional personnel within its organization, unless additional Optional Training services are ordered by the PSAP Customer from Lumen.

6.7.3 PSAP Call Takers / Dispatchers

Lumen will provide either PSAP training or train-the-trainer training including:

- Training the Trainer: one on-site training session on six (6) workstations for up to eight (8) PSAP Power 911 call takers/dispatchers. This training is expected to last for two full days (six training hours per day). Training will be provided in train-the-trainer format.
- PSAP Training: in lieu of Training the Trainer Lumen will provide all PSAP Training. Training is provided to a maximum of eight (8) PSAP call takers/dispatchers, per training session, with a maximum of two (2) training

sessions per day. One workstation for each two (2) students is required. Additional Optional Training days may be purchased to accommodate all call takers/dispatchers.

6.7.4 PSAP Administrators

Lumen will provide one (1) on-site training session for PSAP administrators. This training is expected to last for two (2) full days (six training hours per day). PSAP may determine the number and type of employees attending the Lumen on-site training if the PSAP provides an adequate training facility and workstations/computers for number of attendees.

One (1) day of administrator training is typically used to support the cutover. This training will focus on:

- Power 911
- Optional Managed Services elements such as PowerOps, Power Metrics

6.8 Long-Term Recording Support

Lumen standard recording interface at the PSAP (per-position) complies with NENA 04-002 standard for analog recording systems.

6.9 Long-Term Recording – IP Session Span Recording Solution

Additionally, for standard interfaces per above section, Lumen can propose an IP recording solution as a service. Pricing for this solution is on an individual case basis and can be provided after a site survey and capture of the PSAP Customers' total recording requirements. Support for SIP Recording ("SIPREC") will require additional optional hardware components and can be quoted as needed for support from the VIPER solution.

6.10 Lumen Project Plan

Lumen will provide each PSAP Customer with a customized project plan detailing all Lumen and Customer requirements and deliverables.

7.0 SYSTEM TESTING and PRODUCTION MIGRATION

Lumen will work with the PSAP Customer to finalize and mutually agree on testing and production migration plans for the Lumen Call Handling Services. The testing and production migration plans will define:

- Tests to be conducted prior to and as part of migration to Services
- System testing and production migration for each PSAP
- (Note that Core Equipment purchase includes a required extra position to be located at each node for testing purposes)

If requested by Lumen, the PSAP Customer will provide personnel at each PSAP to assist Lumen in the execution of the migration testing to:

- Answer the test voice and text calls
- Join conference bridges
- Provide test call screen prints and/or voice recordings/text transcripts to Lumen on request (unless PSAP Customer is prohibited by law to do so)
- Provide test call feedback on voice quality, functionality, and other information
- Text call interactions including predefined standard messages

8.0 MONITORING, MAINTENANCE, and OPERATIONAL TECHNICAL SUPPORT

Lumen is responsible for all monitoring, maintenance, and operational technical support for all Core Equipment and PSAP CPE.

Maintenance and support include periodic software upgrades, OS upgrades, and other system maintenance as necessary for the operation of the equipment. Lumen will notify the PSAP Customer before performing any activity that may impact on the Core Equipment, PSAP CPE or the Services (including any installations, changes, or upgrades to software, hardware, or network).

Lumen provides remote monitoring of all CPE equipment in cooperation with Intrado. Alarms are captured and responded to 365 x 7 x 24. The affected PSAP will be notified of any alarms identified as critical or major. Lumen, in cooperation with Intrado will resolve alarms remotely and, when required, the Lumen 911 NOC will initiate a technician dispatch.

Lumen will provide 365x7x24 monitoring and response to all Lumen provided network transport and terminating equipment. All circuits provided by Lumen will follow FCC requirements, identifying them as critical NG9-1-1 infrastructure, ensuring priority response and repair.

8.1 PSAP Obligations

For on-site support services the PSAP Customer will:

- Brief on-site Lumen technician on issue(s) and actions taken.
- Allow Lumen 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 closing the case.
- Cooperate with Lumen and perform all acts that are reasonable or necessary to enable Lumen 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.

8.2 Replacement Parts Procedures for Onsite Support

Lumen will provide replacement parts.

8.2.1 Critical Core Equipment Spares

Critical core equipment spares are stored at Lumen Core Data Centers

8.2.2 Critical PSAP Equipment Spares

Lumen will provide all manufacturers' critical spares within a reasonable distance from PSAP. Lumen will identify where crash kits will be located during the planning stages of each customer's implementation.

8.2.3 Shipment of Replacement Parts

Intrado will ship all replacement equipment, not contained in spares, to Lumen. When received, Lumen will replace defective equipment at PSAP.

8.3 Lumen Managed NG9-1-1 PSAP ESInet

Customer is responsible for replacement cost of any equipment damaged not due to normal wear and tear, due to customer misuse, and "Acts of God", such as lighting, flooding, roof leaks, etc.

8.4 Preventative Maintenance

- Lumen will perform PSAP preventative maintenance quarterly or four (4) times a year on site.
- Lumen will perform onsite Data Center Core preventative maintenance at a minimum monthly.

8.5 Operating System Patch Management

- Lumen will install all OS patches as manufacturers tests and approves for field use
- OS Patches are normally released and installed monthly
- Lumen technicians will deploy all OS patches on all servers
- Lumen may push patches out to PSAP call taking positions and may require customer to reboot workstations
- Lumen Project Manager will schedule all OS patch dates with PSAP Customers.

8.6 Application Patch Management – Security and / or Hotfixes

- Lumen will install all critical application patches as instructed by CPE equipment manufacturers
- Lumen will install all application patches on all servers and critical system components. This may include routers, switches, or gateways
- Lumen will install all application patches on site if required.
- Lumen will remotely push all application patches to workstations when only a reboot is required
- Lumen Project Manager will schedule all application updates with PSAP customer

8.7 Anti-Virus Updates

- Lumen will update all anti-virus definition files monthly as released by manufacturers
- Lumen will remotely push updates, and no rebooting of workstations or servers will be required
- Lumen will notify the customer of all scheduled pushes of definition files

8.8 Firmware and IOS updates

Lumen will update gateway device firmware, firewall, router and switch IOS as recommended by manufacturers.

9.0 System Upgrades

Lumen's MECH Solution per-seat pricing includes all system upgrades at no cost to PSAPs. Lumen will perform a minimum of one upgrade per year that adds features and functionality to the VIPER CPE solutions. This does not include hotfixes or service packs to address software and hardware fixes which are covered under Section 8 of this document

- Lumen will provide all software required for upgrade
- Lumen will provide all field engineering and technician resources to implement upgrade

10.0 Software and Equipment EOL and EOS notices

10.1 EOL and EOS notices

Lumen will advise the customer of all EOL (End of Life) and EOS (End of Services) with respective milestone dates.

10.2 EOL and EOS Process

When a manufacturer announces a product will be going End of Life (EOL), Lumen will evaluate:

- End of Sale date (EOS) – Last day product can be purchased
- Last date to renew manufacturers' support services
- Whether manufacturers will support beyond the EOS date.
- Availability of replacement devices beyond EOS date
- Criticality of device in call delivery

Lumen will replace devices determined unsupportable before or after EOS date

11.0 Billable Move, Add, or Change Orders (MAC)

Any service or equipment not described in this service guide may be billable to the customer. The following are examples of billable work activities:

- Add new call taking positions (Monthly recurring rate would also apply)
- Adding new admin or CAMA trunk gateways (Monthly recurring rate would also apply)
- Terminating new admin lines on existing system
- Interfacing to new admin phone system
- Interfacing to new logging recorder
- Interfacing to new CAD system
- Interfacing to new radio system
- Move or rearrangement of existing 9-1-1 equipment, network, wiring and cabling
- Moving existing equipment at PSAP request
- Rewiring console furniture at PSAP request
- Moving equipment to new PSAP building

While the above are the most common examples of billable activities, the list is not inclusive of all possible billable MAC requests.

12.0 MIGRATION EXISTING MIS DATA (Not Included)

- ☐ Lumen will not migrate existing CPE MIS data to the VIPER MECH
- ☐ Lumen will leave existing MIS servers onsite for customer use
- ☐ Lumen will not be responsible for maintaining old system servers, customer data, or customer backups.