



Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

State of West Virginia
 Request for Quotation
 31 - Public Safety

Proc Folder: 127916

Doc Description: Command Center Upgrade

Proc Type: Central Purchase Order

Date Issued	Solicitation Closes	Solicitation No	Version
2015-10-22	2015-11-24 13:30:00	CRFQ 0622 PRS1600000001	1

BID RECEIVING LOCATION

BID CLERK
 DEPARTMENT OF ADMINISTRATION
 PURCHASING DIVISION
 2019 WASHINGTON ST E
 CHARLESTON WV 25305
 US

VENDOR

Vendor Name, Address and Telephone Number:

Electronic Specialty Company
 1325 Dunbar Avenue
 Dunbar, WV 25064
 Telephone: (304) 766-6277

11/24/15 10:33:27
 WV Purchasing Division

FOR INFORMATION CONTACT THE BUYER

Crystal Rink
 (304) 558-2402
 crystal.g.rink@wv.gov

William K. Miller, Vice President

Signature X *William K Miller*

FEIN # 55-0452548

DATE 11/23/2015

All offers subject to all terms and conditions contained in this solicitation

ADDITIONAL INFORMATION:

THE WEST VIRGINIA STATE PURCHASING DIVISION FOR THE AGENCY, THE WEST VIRGINIA DIVISION OF PROTECTIVE SERVICES, IS SOLICITING BIDS TO ESTABLISH A ONE-TIME CONTRACT FOR COMMAND CENTER UPGRADES PER THE ATTACHED.

INVOICE TO		SHIP TO	
PROTECTIVE SERVICES DIVISION OF BLDG 1, RM 152-A 1900 KANAWHA BLVD E CHARLESTON WV25305 US		PROTECTIVE SERVICES BLDG 1 RM 152-A 1900 KANAWHA BLVD E CHARLESTON WV 25305 US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
1	Command Center Upgrade				\$249,828.00

Comm Code	Manufacturer	Specification	Model #
92121700			

Extended Description :

Command Center Upgrade

ELECTRONIC SPECIALTY COMPANY

SCHEDULE OF EVENTS

Line	Event	Event Date
1	MANDATORY PRE-BID MEETING	11/03/15 2015 9AM EST
2	VENDOR QUESTION DEADLINE	11/10/15 2015 4PM EST

PRS160000001	Document Phase Final	Document Description Command Center Upgrade	Page 3 of 3
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ADDITIONAL TERMS AND CONDITIONS

See attached document(s) for additional Terms and Conditions

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: CRFQ PRS1600000001

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:
(Check the box next to each addendum received)

- | | | | |
|-------------------------------------|----------------|--------------------------|-----------------|
| <input checked="" type="checkbox"/> | Addendum No. 1 | <input type="checkbox"/> | Addendum No. 6 |
| <input type="checkbox"/> | Addendum No. 2 | <input type="checkbox"/> | Addendum No. 7 |
| <input type="checkbox"/> | Addendum No. 3 | <input type="checkbox"/> | Addendum No. 8 |
| <input type="checkbox"/> | Addendum No. 4 | <input type="checkbox"/> | Addendum No. 9 |
| <input type="checkbox"/> | Addendum No. 5 | <input type="checkbox"/> | Addendum No. 10 |

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

Electronic Specialty Company
Company William K. Miller, Vice President
William K. Miller
Authorized Signature
11/23/2015
Date

NOTE: This addendum acknowledgment should be submitted with the bid to expedite document processing.



Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

State of West Virginia
 Request for Quotation
 31 - Public Safety

Proc Folder: 127916

Doc Description: Addendum #1 Command Center Upgrade

Proc Type: Central Purchase Order

Date Issued	Solicitation Closes	Solicitation No	Version
2015-11-12	2015-11-24 13:30:00	CRFQ 0622 PRS1600000001	2

BID RECEIVING LOCATION

BID CLERK
 DEPARTMENT OF ADMINISTRATION
 PURCHASING DIVISION
 2019 WASHINGTON ST E
 CHARLESTON WV 25305
 US

VENDOR

Vendor Name, Address and Telephone Number:

Electronic Specialty Company
 1325 Dunbar Avenue
 Dunbar, WV 25064
 Telephone: (304) 766-6277

FOR INFORMATION CONTACT THE BUYER

Crystal Rink
 (304) 558-2402
 crystal.g.rink@wv.gov

William Miller, Vice President

Signature X *William Miller* FEIN # 5500452548

DATE 11/23/2015

All offers subject to all terms and conditions contained in this solicitation

ADDITIONAL INFORMATION

THE WEST VIRGINIA STATE PURCHASING DIVISION FOR THE AGENCY, THE WEST VIRGINIA DIVISION OF PROTECTIVE SERVICES, IS SOLICITING BIDS TO ESTABLISH A ONE-TIME CONTRACT FOR COMMAND CENTER UPGRADES PER THE ATTACHED.

INVOICE TO		SHIP TO	
PROTECTIVE SERVICES DIVISION OF BLDG 1, RM 152-A 1900 KANAWHA BLVD E CHARLESTON WV25305 US		PROTECTIVE SERVICES BLDG 1 RM 152-A 1900 KANAWHA BLVD E CHARLESTON WV 25305 US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
1	Command Center Upgrade	0.00000			\$249,828.00

Comm Code	Manufacturer	Specification	Model #
92121700			

Extended Description :
 Command Center Upgrade

ELECTRONIC SPECIALTY COMPANY

SCHEDULE OF EVENTS

Line	Event	Event Date
1	MANDATORY PRE-BID MEETING	11/03/15 2015 50 PM EST
2	VENDOR QUESTION DEADLINE	11/10/15 2015 4 PM EST

PRS160000C001	Document Phase Draft	Document Description Addendum #1 Command Center Up grade	Page 3 of 3
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ADDITIONAL TERMS AND CONDITIONS

See attached document(s) for additional Terms and Conditions

SOLICITATION NUMBER: CRFQ PRS1600000001
Addendum Number: 1

The purpose of this addendum is to modify the solicitation identified as (“Solicitation”) to reflect the change(s) identified and described below.

Applicable Addendum Category:

- Modify bid opening date and time
- Modify specifications of product or service being sought
- Attachment of vendor questions and responses
- Attachment of pre-bid sign-in sheet
- Correction of error
- Other

Description of Modification to Solicitation:

To attach the pre-bid meeting sign-in sheet

Additional Documentation: Documentation related to this Addendum (if any) has been included herewith as Attachment A and is specifically incorporated herein by reference.

Terms and Conditions:

1. All provisions of the Solicitation and other addenda not modified herein shall remain in full force and effect.
2. Vendor should acknowledge receipt of all addenda issued for this Solicitation by completing an Addendum Acknowledgment, a copy of which is included herewith. Failure to acknowledge addenda may result in bid disqualification. The addendum acknowledgement should be submitted with the bid to expedite document processing.

ATTACHMENT A

SIGN IN SHEET

Page ___ of ___

Request for Proposal No. PRS16*1

PLEASE PRINT

Date: 11-3-2015

* PLEASE BE SURE TO PRINT LEGIBLY - IF POSSIBLE, LEAVE A BUSINESS CARD

FIRM & REPRESENTATIVE NAME	MAILING ADDRESS	TELEPHONE & FAX NUMBERS
Company: <u>Electronic Specialty Company</u> Rep: <u>Bill Miller</u> Email Address: <u>Bill@electronic-specialty.com</u>	<u>1825 Dunbar Ave.</u> <u>Dunbar WY 25064</u>	PHONE <u>304-766-6277</u> TOLL FREE FAX <u>304-766-6270</u>
Company: <u>Danhill Construction</u> Rep: <u>David Elstrik</u> Email Address: <u>justin.dozier@yahoo.com</u>	<u>PO Box 685</u> <u>Gawley Bridge, WY 25085</u>	PHONE <u>304-632-1606</u> TOLL FREE FAX <u>304-632-1501</u>
Company: _____ Rep: _____ Email Address: _____	_____ _____ _____	PHONE TOLL FREE FAX
Company: _____ Rep: _____ Email Address: _____	_____ _____ _____	PHONE TOLL FREE FAX
Company: _____ Rep: _____ Email Address: _____	_____ _____ _____	PHONE TOLL FREE FAX

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: PRS160000001

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Addendum Numbers Received:

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| <input checked="" type="checkbox"/> Addendum No. 1 | <input type="checkbox"/> Addendum No. 6 |
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| <input type="checkbox"/> Addendum No. 4 | <input type="checkbox"/> Addendum No. 9 |
| <input type="checkbox"/> Addendum No. 5 | <input type="checkbox"/> Addendum No. 10 |

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

Electronic Specialty Company

Company



Authorized Signature

William K. Miller, Vice President

11.23.15

Date

NOTE: This addendum acknowledgement should be submitted with the bid to expedite document processing.
Revised 6/8/2012

CERTIFICATION AND SIGNATURE PAGE

By signing below, or submitting documentation through wvOASIS, I certify that I have reviewed this Solicitation in its entirety; understand the requirements, terms and conditions, and other information contained herein; that I am submitting this bid, offer or proposal for review and consideration; that I am authorized by the vendor to execute and submit this bid, offer, or proposal, or any documents related thereto on vendor's behalf; that I am authorized to bind the vendor in a contractual relationship; and that to the best of my knowledge, the vendor has properly registered with any State agency that may require registration.

Electronic Specialty Company

(Company)

William K Miller

(Authorized Signature) (Representative Name, Title)

William K. Miller, Vice President

(304) 766-6277 (304) 766-6270 11/23/2015

(Phone Number) (Fax Number) (Date)

**REQUEST FOR QUOTATION
CRFQ PRS1600000001
Upgrade to Capitol Police Command Center**

SPECIFICATIONS

- 1. PURPOSE AND SCOPE:** The West Virginia Purchasing Division is soliciting bids on behalf of Division of Protective Services to establish a contract for one time services to upgrade the Capitol Police Command Center.

- 2. DEFINITIONS:** The terms listed below shall have the meanings assigned to them below. Additional definitions can be found in section 2 of the General Terms and Conditions.
 - 2.1 “Contract Services”** means upgrade of facilities per the attached specifications sheet.

 - 2.2 “Pricing Page”** means the pages, contained wvOASIS or attached hereto as Exhibit A, upon which Vendor should list its proposed price for the Contract Services.

 - 2.3 “Solicitation”** means the official notice of an opportunity to supply the State with goods or services that is published by the Purchasing Division.

- 3. QUALIFICATIONS:** Vendor, or Vendor’s staff if requirements are inherently limited to individuals rather than corporate entities, shall have the following minimum qualifications:
 - 3.1. See Attached Scope of Work**

- 4. MANDATORY REQUIREMENTS:**
 - 4.1 Mandatory Contract Services Requirements and Deliverables:** Contract Services must meet or exceed the mandatory requirements listed below.
 - 4.1.1 See attached Scope of Work**

REQUEST FOR QUOTATION
CRFQ PRS1600000001
Upgrade to Capitol Police Command Center

5. CONTRACT AWARD:

5.1 Contract Award: The Contract is intended to provide Agency with a purchase price for the Contract Services. The Contract shall be awarded to the Vendor that provides the Contract Services meeting the required specifications for the lowest overall total cost as shown on the Pricing Pages.

5.2 Pricing Page: Vendor should complete the Pricing Page by identifying the total cost of the upgrade including all parts, labor and licensing. Vendor should complete the Pricing Page in full as failure to complete the Pricing Page in its entirety may result in Vendor's bid being disqualified.

Vendor should type or electronically enter the information into the Pricing Pages through wvOASIS, if available, or as an electronic document. In most cases, the Vendor can request an electronic copy of the Pricing Pages for bid purposes by sending an email request to the following address: Crystal.G.Rink@wv.gov

- 6. PERFORMANCE:** Vendor and Agency shall agree upon a schedule for performance of Contract Services and Contract Services Deliverables, unless such a schedule is already included herein by Agency. In the event that this Contract is designated as an open-end contract, Vendor shall perform in accordance with the release orders that may be issued against this Contract.
- 7. PAYMENT:** Agency shall pay lump sum at completion and acceptance, as shown on the Pricing Pages, for all Contract Services performed and accepted under this Contract. Vendor shall accept payment in accordance with the payment procedures of the State of West Virginia.
- 8. TRAVEL:** Vendor shall be responsible for all mileage and travel costs, including travel time, associated with performance of this Contract. Any anticipated mileage or travel costs may be included in the flat fee or hourly rate listed on Vendor's bid, but such costs will not be paid by the Agency separately.
- 9. FACILITIES ACCESS:** Performance of Contract Services may require access cards and/or keys to gain entrance to Agency's facilities. In the event that access cards and/or keys are required:

**REQUEST FOR QUOTATION
CRFQ PRS1600000001
Upgrade to Capitol Police Command Center**

- 9.1.** Vendor must identify principal service personnel which will be issued access cards and/or keys to perform service.
- 9.2.** Vendor will be responsible for controlling cards and keys and will pay replacement fee, if the cards or keys become lost or stolen.
- 9.3.** Vendor shall notify Agency immediately of any lost, stolen, or missing card or key.
- 9.4.** Anyone performing under this Contract will be subject to Agency's security protocol and procedures.
- 9.5.** Vendor shall inform all staff of Agency's security protocol and procedures.

10. VENDOR DEFAULT:

10.1. The following shall be considered a vendor default under this Contract.

- 10.1.1.** Failure to perform Contract Services in accordance with the requirements contained herein.
- 10.1.2.** Failure to comply with other specifications and requirements contained herein.
- 10.1.3.** Failure to comply with any laws, rules, and ordinances applicable to the Contract Services provided under this Contract.
- 10.1.4.** Failure to remedy deficient performance upon request.

10.2. The following remedies shall be available to Agency upon default.

- 10.2.1.** Immediate cancellation of the Contract.
- 10.2.2.** Immediate cancellation of one or more release orders issued under this Contract.
- 10.2.3.** Any other remedies available in law or equity.

**REQUEST FOR QUOTATION
CRFQ PRS160000001
Upgrade to Capitol Police Command Center**

11. MISCELLANEOUS:

11.1. Contract Manager: During its performance of this Contract, Vendor must designate and maintain a primary contract manager responsible for overseeing Vendor's responsibilities under this Contract. The Contract manager must be available during normal business hours to address any customer service or other issues related to this Contract. Vendor should list its Contract manager and his or her contact information below.

Contract Manager: Mark Eggleton
Telephone Number: (304) 766-6277
Fax Number: (304) 766-6270
Email Address: marke@electronicspecialty.com

CRFQ PRS1600000001

DPS Command Center and Surveillance System

Scope of Work

Project Summary:

Security Systems Integrator will provide and install an enterprise level video management system (VMS) to upgrade the existing CCTV analog video surveillance system at the West Virginia State Capitol facility. Other enhancements include a new video wall, command console and collaboration workstation station. The turn-key installation will be a phased approach in order to maintain a functional command center at all times. Work is to be performed by a certified security integrator only.

The goal of this project is to migrate and control the existing analog cameras to an open architecture state of the art digital recording system. The video management system (VMS) must be recorded on an upgradable embedded windows server based platform with optimized raid 5 storage as a minimum. In addition to the standard 1 to 8 megapixel cameras, the VMS must support 16 to 30 megapixels IP cameras with integrated reference based analytics. *(See specification for details)* The VMS must integrate with the Command Center existing access control system Lenel/Facility Commander Wnx/OnGuard via software control. VMS must be compatible with "all in one" PC - 55 inch or greater touch screen, build in video conferencing codecs, annotation, dual Wi-Fi based collaboration workstation. *(See specification for details)*

Phasing:

Phase 1 begins with migrating the analog video to IP, which includes installing Coaxitron converter, 4 channel video encoders, servers, switches, UPS, IP based UPS/KVM switch with integrated work monitor and keyboard and collaboration workstations. The console collaboration workstation will include UTC/Facility Commander/lenel Onguard and CCTV VMS client software for viewing, control and integration of card access and IP CCTV systems. Upon completion of the video migration operator training will be performed. Security Systems Integrator will assist and train the division of protective services in setting up the initial camera views for the legacy base of camera by manufacturer as follows:

GE PTZ	60
Pelco PTZ	28
GE Fixed	43
Pelco Fixed	46

Training will be on site and will cover multiple shifts. There will be at least four different in time training sessions. At a minimum 12 people will be trained over the four sessions.

Phase 2 Security Systems Integrator will assist Division of Protective Services (DPS) in setting up temporary equipment and collaboration workstation necessary to run a remote command center. DPS must have access as a minimum to monitor card access system, CCTV feeds, weapons terminal, and radios. Temporary command/control center will be located in room outside of the existing DPS command center. Security Systems Integrator will require a desk to locate the collaboration workstation. Security Systems Integrator will provide network connection to existing DPS command center servers for card access and CCTV servers. Once temporary command center is in operation phase 3 can commence.

Phase 3 Security Systems Integrator must disassemble existing console and relocate to destination on-site as requested by DPS. Security Systems Integrator will provide and install new console for command center personnel as per specifications. Security integrator will provide a video wall consisting of 8 - commercial grade 40 inch monitors designed for continuous use, located 18 inches in front of the new console workstations. Security Systems Integrator will reuse part of existing console to maintain section pertaining to bollard controls, located as per drawing. Each of the two operator work areas will have five monitors mounted as per drawing. Security Systems Integrator will repurpose 8 existing 19 inch console monitors to these locations and provide 1 new 24" HD commercial continuous use monitor for VMS viewing video. A VMS/card access collaboration workstation will be located at each operator workstation. These will be used for controlling the video wall servers and live/playback video.

Video analytics will be deployed in several areas to assist with notification of people or a vehicle in a given area of interest. The VMS must utilize reference based analytics to ID a person or a vehicle in a given zone in a given time. Video analytic based encoders with storage will be used at the Laidley parking lot and parking garage. *(See Specification sections for full details)* The video from the Laidley parking lot and parking garage encoders will be connected back to the VMS server via a new high-speed commercial grade 5.8 Ghz wireless network. The systems integrator will perform a wireless survey and provide results in written form to DPS. The solution will provide a minimum of 100 Mbs of sustainable of connectivity.

The system must provide adequate raid 5 storage for a minimum of 30 days at 30 FPS/high quality/50 % motion/max resolution per camera/encoder. Events of interest will be exported to owner provided permanent storage for future review.

System training will be provided for DPS personnel who will be granted access to review and export video. Security Systems Integrator will train management on setting up VMS users, granting access rights and configuring video wall display layouts after installation is complete and tested. Security Systems Integrator will train system operators on collaboration workstation, VMS software operation, remote control via table/smart phone, application loading, digital interactive whiteboard/document annotation and business-class video conferencing. Training will be on site and will cover multiple shifts. There will be at least four different in time training sessions. At a minimum 12 people will be trained over the four sessions.

Scope of Work:

- SECURITY SYSTEMS INTEGRATOR will furnish project equipment literature, all cable for interconnections, video adapters, rack mounts for encoders, mounts, video servers, data switches, control translators, workstation computers, and video wall computers, and any other parts as needed to provide a complete and working system as described herein.
- SECURITY SYSTEMS INTEGRATOR will furnish installation material, ladders, or tools as needed *Exception Note (If a lift is required to get to a camera that requires its protocol to be changed in order to function properly said lift will be provided by others)
- SECURITY SYSTEMS INTEGRATOR to properly label both ends of any new cables and maintain schedule of cable ID.
- SECURITY SYSTEMS INTEGRATOR will test and document all new cables.
- SECURITY SYSTEMS INTEGRATOR will prepare connection to Owner's LAN and assign IP addresses as directed by IT.
- SECURITY SYSTEMS INTEGRATOR will perform all work in a workmanlike manner, following all safety requirements and will report in and out as they perform work.
- SECURITY SYSTEMS INTEGRATOR will perform all in a phased approach as describe herein.

- SECURITY SYSTEMS INTEGRATOR will build basic configuration for video wall and train DPS how to add additional views of their choice
- SECURITY SYSTEMS INTEGRATOR will configure a user account, an administrator account and train DPS on how to add additional users.
- This work will be performed during normal business hours per schedule approved in advance by DPS
- Work will be performed as follows;
 1. SECURITY SYSTEMS INTEGRATOR to review schedule and installation plan with DPS including any diagrams, drawings and equipment literature.
 2. SECURITY SYSTEMS INTEGRATOR will order equipment as per purchase order and release to work.
 3. SECURITY SYSTEMS INTEGRATOR will setup equipment in insured facility, test equipment, and program to prep equipment prior to onsite delivery.
 4. DPS representative to visit prep facility to validate preparation
 5. DPS installs RECESSED 3 duplex - 120V/20amp power boxes on the video wall to hide behind the monitors and one abnormal off the floor.
 6. SECURITY SYSTEMS INTEGRATOR will visit site to test circuits and begin attaching equipment to server(s).
 7. SECURITY SYSTEMS INTEGRATOR performs phased approach as described for migration and installation of equipment
 8. SECURITY SYSTEMS INTEGRATOR to preform final programming and set up as per schedule
 9. SECURITY SYSTEMS INTEGRATOR performs final systems configuration, testing and operational inspection prior to training
 10. At completion and per schedule approved in advance by DPS, SECURITY SYSTEMS INTEGRATOR will provide onsite operational training of the system for authorized DPS personnel.
- SECURITY SYSTEMS INTEGRATOR will provide As-Built CAD cable diagrams showing circuit routing and equipment locations on drawings and turn over to DPS upon completion.

Notes and Exclusions:

- Owner shall be responsible to identify and properly remove any asbestos or other hazardous materials prior to installation work.
- DPS to furnish any additional 120VAC circuit(s) as needed
- DPS to furnish any additional lifts as needed to install, test, modify or maintain camera system
- DPS to provide internet service needed to support camera system remotely
- DPS to assign a responsible liaison to work with SECURITY SYSTEMS INTEGRATOR regarding scheduling, safety training, alerts and other site specific items so the system can be set up and made operational as expected by DPS
- DPS will be the single point of contact for any construction services or work to be performed by the General Services Division of the Department of Administration

Warranty

- Two year factory sponsored equipment warranty for cameras and server(s)/recording equipment
- One year factory sponsored equipment warranty for all other equipment
- One year labor warranty

Certifications and Integrator Requirements:

Certification:

Security Systems Integrator will provide as an attachment to the bid package proof of factory certification for employee(s) for the following systems. Failure to provide all required certifications will disqualify bidder.

- UTC - Facility Commander Wnx
- UTC - Lenel Onguard
- Avigilon - ACC VMS

- Cisco – (CCNA) Cisco Certified Network Associate Routing & Switching Certification

References:

3 References of similar size and scope are required by all bidders prior to the award of the contract.

Service:

Security Systems Integrator will maintain a service organization that offers 24/7/365 on call technicians with a 4 hour response rate. Spare parts must be kept in service depot located with 15 miles of the capitol.

Video Management System (VMS)

NETWORK VIDEO MANAGEMENT SOFTWARE (NVMS)

1. Avigilon
 - a. No substitutions will be accepted
 - b. Contractor shall provide all applicable Network Video Management Software (NVMS) modules and licenses required to provide a complete and fully functional integration.
 - c. The NVMS shall be installed on hardware which meet or exceed the manufacturer's recommended requirements:
 - d. The NVMS basis of design is the Avigilon Control Center (ACC) version 5.x. The design and performance requirements for the NVMS software are as follows:
 - e. The NVMS shall be available as a stand-alone software offering or pre-loaded on turn-key workstations and servers running Microsoft Windows with configurable storage.
 - e. The NVMS shall be available in a licensed:
 - f. ACC 5.x "Enterprise"] Edition Supporting:
 - 1) One Hundred Twenty Eight (128) cameras per server
 - 2) One Hundred (100) servers per site
 - 3) Unlimited concurrent site connections
 - 4) Unlimited client licenses
3. The NVMS shall be an enterprise level software solution that shall be scalable from one client, server, and camera to hundreds of clients, servers, and cameras.
4. The NVMS shall consist of server software applications and client software applications.
5. The NVMS shall include a gateway software application that connects mobile devices to the NVMS.
6. The NVMS shall support HDSM (High Definition Stream Management) for local and remote users and mobile devices.
7. The NVMS mobile client shall be supported by Android and Apple mobile devices.
8. The NVMS shall be available in the following languages:
 - a. English
9. The NVMS shall include but not limited to the following applications:
 - a. Server Software Applications
 - 1) Control Center Server
 - 2) Control Center Admin Tool
 - 3) Control Center Gateway
 - b. Client Software Applications
 - 1) Control Center Client
 - 2) Control Center Virtual Matrix
 - 3) Control Center Web Client
 - 4) Control Center Player
 - 5) Control Center Camera Installation Tool
 - 6) Control Center Mobile
10. The NVMS shall permit server and client software applications to be installed and run on both the same computer or on separate computers.
11. The NVMS shall support storage and processing of video and audio.

- a. Audio and video must be recorded natively from the camera with no transcoding.
 - b. Audio and video must be synchronized regardless of frame-rate, resolution or bitrate.
12. The NVMS shall support High Definition Stream Management (HDSM) architecture which includes:
- a. Support for the industry standards of JPEG2000, MJPEG, MPEG-4, and H.264 compression formats
 - b. Support for reducing the required client bandwidth and processing power by only transmitting what is necessary to view the video stream at full quality (e.g. if a user is viewing a 16MP camera in a 1MP window then a 1MP representation of the 16MP image shall be transmitted).
 - c. Support for quality “data-aging”, enabling a low quality and high quality stream to be recorded under the same logical ID. After an administrator defined period of time, the higher stream would be deleted and the lower stream would remain until the end of the desired retention period.
 - d. Support for frame “data-aging”, enabling the ability to reduce the image rate of recorded JPEG and JPEG2000 video over time as a means of increasing record time. After an administrator defined period of time, the image rate shall be able to be reduced to one half or one quarter of the original image rate.
13. The Network Video Management Software (NVMS) shall support recording and management of video and audio sources including but not limited to:
- a. Avigilon HD Cameras (1 – 5 Megapixel) or equal
 - b. Avigilon HD Dome Cameras (1 – 5 Mega pixels) or equal
 - c. Avigilon Panoramic HD Dome Cameras (8 Megapixel) or equal
 - d. Avigilon Day/Night H.264 HD Cameras (1– 5 Megapixel) or equal
 - e. Avigilon Day/Night H.264 HD Dome Cameras (1– 5 Megapixel) or equal
 - f. Avigilon HD Bullet Cameras (1– 5 Megapixel) or equal
 - g. Avigilon HD Micro Dome Cameras (1– 2 Megapixel) or equal
 - h. Avigilon HD Pro Cameras (8 – 30 Megapixel) or equal
 - i. Avigilon Day/Night HD PTZ Dome Camera (1–2 Megapixel) or equal
 - j. Composite video from analog cameras, PTZ domes and thermal imagers via Avigilon ENC-4P-H264 analog encoders or equal.
 - k. ACTi Cameras/Encoders
 - l. Arecont Cameras
 - m. Axis Cameras/Encoders
 - n. IQInvision Cameras
 - o. Mobotix Cameras
 - p. ONVIF 1.00, 1.01, and 1.02 Cameras
 - q. ONVIF Profile S Cameras
 - r. Panasonic Cameras
 - s. Pelco Cameras
 - t. Samsung Cameras/Encoders
 - u. Samsung Techwin cameras
 - v. Sanyo Cameras
 - w. Scallop Cameras
 - x. Sightlogix Cameras
 - y. Sony Cameras
 - z. VideoIQ Cameras/Encoders
14. The NVMS shall support receiving digital input triggers and triggering digital outputs through an I/O board.
15. The NVMS shall support recording and monitoring video and audio streams from sources with bandwidth up to 90 Mbit/sec, frame rate up to 60 fps, and video resolution up to 29 MP (6576 x 4384).
16. The NVMS shall support the decompression of H.264 video through the client graphics card/graphical processing unit instead of using the client processing power.
17. The NVMS shall require no proprietary recording hardware, no hardware multiplexer or time-division technology for video and audio recording or monitoring.
18. The NVMS shall not limit the storage capacity and shall allow for upgrades of recording capacity.

19. The NVMS shall digitally sign recorded video and audio using 256-bit encryption so video can be authenticated for evidentiary purposes.
20. The NVMS shall securely transmit all command and control data via TCP/IP using cryptographic keys based on SSL to prevent eavesdropping or tampering.
21. The NVMS will provide the mechanism by which individual alarm(s) from external systems can be pre-selected and configured to be monitored and, in turn, trigger event driven video operations.
22. The NVMS shall support software level integration via an Application Programming Interface (API). The API integration should include but not limited to:
 - a. Bi-directional alarm event processing for monitoring and acknowledgement
 - b. Receiving card access activity events
 - c. Receiving digital input events
 - d. Receiving intrusion zone events
23. Occurrences for "Alarm" and "Reset" conditions for each of the pre-selected Access system alarms will be processed and managed from the NVMS system's Live View workspace that is reserved for displaying alarm notifications in the alarm list message pane or from an alarm viewer. If the Alarm pane is hidden, the alarm can be acknowledged from the Camera display tile.
24. Once an Access system initiated alarm occurrence is acknowledged from the NVMS system, it should be automatically acknowledged and processed in the Access System alarm monitor queue without further operator intervention.
25. The NVMS shall support integration with the following systems:
 - a. GE Security Facility Commander Wnx v7.x platform
 - b. Lenel OnGuard
26. The NVMS shall be capable of being upgraded from one version to another without having to uninstall the previous version.
27. The NVMS shall be capable of being upgraded from one edition to another without having to uninstall the application.
28. The NVMS shall be capable of being upgraded from one edition to another without losing system configuration information or archived video.
29. The NVMS shall automatically detect if video or audio source firmware is out of date with respect to the current installed software and upgrade it.
30. The NVMS shall automatically detect if client application software is out of date with respect to the current installed server software and upgrade it.
31. The NVMS shall run as a service configured to automatically start when the server or workstation is powered on and automatically recover from failure or attempted tampering.
32. The NVMS shall allow system administration, and live and recorded video and audio monitoring all from a single client application that can be located anywhere on the network.
33. The NVMS shall automatically discover all Server instances running on computers connected to the same network as the Client.
34. The NVMS shall provide a search functionality to discover Server instances running on computers connected on a different network segment than the Client by using IP addresses or hostnames.
35. The Network Video Management Software (NVMS) shall manage and synchronize servers as a cluster with shared data and tasks to provide crash-proof enterprise server management.
36. The NVMS shall automatically discover video and audio sources that are connected to the same network as the Server.
37. The NVMS shall provide a search functionality to discover video and audio sources that are connected on a different network segment than the Server.
38. The NVMS shall provide the ability to connect a video or audio source to multiple NVRs to achieve redundant recording.
39. The NVMS shall provide the ability to create a failover connection for a video or audio source. If the NVR that the video or audio source is connected to goes offline then the failover NVR will take over the connection.
40. The NVMS shall provide administration of all system connections from a single window.

41. The NVMS shall support receiving Simple Network Management Protocol (SNMP) messages from servers and alert the user.
42. The NVMS shall detect if the video or audio signal is lost and alert the system administrator.
43. The NVMS shall provide the capability to rename all video and audio sources and NVRs.
44. The NVMS shall record video and audio streams based on a recording schedule that can be defined individually for each video source. The schedule shall be created with the following parameters to include but not limited to:
 - a. Recording Mode
 - b. Continuous
 - c. Motion
 - d. Digital Inputs
 - e. Alarms
 - f. POS Transactions
 - g. License Plates
 - h. Time and Date Settings
 - i. Daily
 - j. Weekly
45. The NVMS shall provide the ability to manually trigger recording.
46. The NVMS shall provide a pre-event and post-event recording option.
47. The NVMS shall provide a reference frame recording option in the absence of events.
48. The NVMS shall perform motion detection on each individual video source with adjustable sensitivity, threshold and detection zones.
49. The NVMS shall provide the ability to record and maintain a primary and secondary video stream for a set amount of time before the primary stream is discarded as a means of increasing record time. This setting can be configured separately for each H.264 video source.
50. The NVMS shall provide the ability to set a maximum recorded video retention time for each video source.
51. The NVMS shall perform dynamic bandwidth management to ensure that the total bandwidth does not overload the system.
52. The NVMS shall authenticate users before granting access to the system. Access rights for each user can be defined individually for each user, and shall include but not limited to:
 - a. View live images
 - 1) Use PTZ controls
 - 2) Lock PTZ controls
 - 3) Trigger manual recording
 - 4) Trigger digital outputs
 - 5) Listen to microphones
 - 6) Broadcast to speakers
 - b. View recorded images
 - 1) Export images
 - 2) Backup images
 - c. Manage saved views
 - d. Manage maps
 - e. Manage web pages
 - f. Manage virtual matrix monitors
 - g. Initiate collaboration sessions
 - h. Manage user sessions
 - i. View server status
 - j. Setup cameras
 - 1) Setup general settings
 - 2) Setup network settings
 - 3) Setup image and display settings

- 4) Setup compression and image rate settings
- 5) Setup image dimension settings
- 6) Setup motion detection settings
- 7) Setup privacy zone settings
- 8) Setup manual recording settings
- 9) Setup digital input & output settings
- 10) Setup microphone settings
- 11) setup speaker settings
- k. Setup sites
 - 1) Setup name
 - 2) Manage site
 - 3) Setup site view
 - 4) Setup user and group settings
 - 5) Setup alarm management settings
 - 6) Setup POS transaction settings
 - 7) Setup LPR settings
 - 8) Setup email settings
 - 9) Setup rule engine settings
 - 10) View site logs
 - 11) Connect and disconnect cameras
 - 12) Import and export settings
- l. Setup servers
 - 1) Setup name
 - 2) Setup schedule settings
 - 3) Setup recording and bandwidth settings
 - 4) Setup scheduled backup settings
- m. Access to individual video and audio sources
- 53. The NVMS shall provide the ability to import members of Active Directory groups as users in the NVMS. Changes made to members in the Active Directory are automatically synced with the NVMS.
- 54. The NVMS shall optionally support using Windows credentials to authenticate users.
- 55. The NVMS shall provide the ability to create and schedule alarms.
- 56. The NVMS shall provide the ability to schedule backups of recorded video with associated events to a local folder or mapped network drive.
- 57. The NVMS shall provide the ability to email users and system administrators when an event or system health error occurs.
- 58. The NVMS shall provide the ability to schedule when email notifications are sent.
- 59. The NVMS shall provide the ability to include camera images in email notifications.
- 60. The NVMS shall maintain an event log for the following events to include but not limited to:
 - a. Server Events
 - 1) Server application starting up
 - 2) Server application shutting down
 - 3) Server application terminated unexpectedly
 - 4) Server application low on resources
 - 5) Server application installation error
 - 6) License expires soon
 - 7) License expired
 - 8) Database error
 - 9) Data initialization error
 - 10) Data volume failed
 - 11) Data volume recovered
 - 12) Data volume size reduced

- 13) Data write error
- 14) Data upgrade started
- 15) Data upgrade completed
- 16) Data upgrade failed
- 17) Data recovery started
- 18) Data recovery completed
- 19) Data recovery failed
- 20) Bookmark save failed
- 21) Network connection found
- 22) Network connection lost
- 23) Email send error
- 24) Server hardware error
- 25) Backup started
- 26) Backup completed
- 27) Backup failed
- 28) Server connection lost

b. Device Events

- 1) Connection created
- 2) Connection removed
- 3) Connection created to standby server
- 4) Connection removed from standby server
- 5) Connection failure
- 6) Connection restored
- 7) Network packet loss unacceptable
- 8) Network packet loss acceptable
- 9) Motion detection started
- 10) Motion detection ended
- 11) Recording started
- 12) Recording ended
- 13) Recording interrupted
- 14) Recording resumed
- 15) Digital input activated
- 16) Digital input deactivated
- 17) Firmware upgrade started
- 18) Firmware upgrade completed
- 19) Firmware upgrade failed

c. User Events

- 1) User login
- 2) User logout
- 3) Server setting changed
- 4) Site setting changed
- 5) Device setting changed
- 6) Device connected
- 7) Device disconnected
- 8) Digital output triggered
- 9) Bookmark added
- 10) Bookmark updated
- 11) Bookmark deleted
- 12) PTZ moved
- 13) PTZ idle
- 14) Export performed

- 15) Speaker activated
 - 16) Speaker deactivated
 - 17) Virtual matrix monitor opened
 - 18) Map added
 - 19) Map updated
 - 20) Map deleted
 - 21) View added
 - 22) View updated
 - 23) View deleted
 - 24) Web Page added
 - 25) Web Page updated
 - 26) Web Page deleted
- d. Alarm Events
- 1) Alarm acknowledged
 - 2) Alarm auto acknowledged
 - 3) Alarm triggered
 - 4) Alarm assigned
 - 5) Alarm unassigned
 - 6) Alarm purged
- e. POS Transaction Events
- 1) POS transaction started
 - 2) POS transaction ended
 - 3) POS transaction exception
- f. License Plate Recognition Events
- 1) License plate detection started
 - 2) License plate detection ended
 - 3) License plate watch-list match
61. The NVMS shall have the capability to schedule and execute any of the following actions in response to any of the events listed above:
- a. User Notification Actions
- 1) Display on-screen message
 - 2) Send an email
 - 3) Play a sound
- b. Monitoring Actions
- 1) Start live streaming video
 - 2) Create Bookmark
 - 3) Open a saved view
 - 4) Start live streaming on a virtual matrix monitor
 - 5) Open a map on a virtual matrix monitor
 - 6) Open a web page on a virtual monitor
- c. Device Actions
- 1) Reboot camera
 - 2) Trigger digital output
- d. PTZ Actions
- 1) Go to Preset
 - 2) Run a Pattern
 - 3) Set Auxiliary
 - 4) Clear Auxiliary
- e. Alarm actions
- 1) Trigger an alarm
 - 2) Acknowledge an alarm

62. The NVMS shall provide the ability to create customized on-screen messages and email notifications.
63. The NVMS shall combine and list all on-screen messages in one location and color code the importance of each message.
64. The NVMS shall provide a maintenance log and audit trail of all system errors and events.
65. The NVMS shall report the status of all connected servers within a cluster and provide the option to export the information in PDF format.
66. The NVMS shall provide the ability to receive transaction information from point-of-sale sources.
67. The NVMS shall support multiple encoding formats from point-of-sale sources.
68. The NVMS shall provide the ability to monitor live and recorded transactions from point-of-sale sources with linked video.
69. The NVMS shall provide the ability to generate events based on point-of-sale transaction exceptions.
70. The NVMS shall provide the ability to define a region of an image where license plate detection is performed. Detected license plates shall be stored along with the video data.
71. The NVMS shall provide the ability to create a watch-list that will be used to create events when any license plate on the watch-list is detected in the images being analyzed.
72. The NVMS shall provide the ability to enable and configure PTZ control on the RS-485 interface of a video source.
73. The NVMS shall support the following list of PTZ camera protocols to include but not limited to:
 - a. American Dynamics Sensormatic
 - b. AXSYS
 - c. AXSYS DCU
 - d. Ernitec ERNA
 - e. Honeywell Diamond
 - f. Kalatel ASCII
 - g. Pelco D
 - h. Pelco P
 - i. TEB Ligne
 - j. Vicon extended
 - k. Vicon normal
 - l. Videotec Legacy
 - m. Videotec MACRO
74. The NVMS shall provide the ability to change the network settings for a video and audio source.
75. The NVMS shall provide the ability to change image quality and image rate parameters for a video source without affecting the settings on the other video sources.
76. The NVMS shall provide the ability to enable a secondary stream for live viewing.
77. The NVMS shall provide the ability to change the exposure, iris, IR filter, backlight compensation, gain, priority, sharpening, saturation, focus, and white balance settings for a video source.
78. The NVMS shall provide the ability to change the image dimensions for a video source.
79. The NVMS shall provide the ability to rotate the image 90°, 180° or 270° for a video source.
80. The NVMS shall provide the ability to add privacy zones to a video source to block unwanted areas in the image field of view.
81. The NVMS shall provide the ability to set a maximum recording duration for manually triggered recording for a video source.
82. The NVMS shall provide the ability to change the input, output, gain and volume for an audio source.
83. The NVMS shall provide for full-duplex two-way audio communication.
84. The NVMS shall provide the ability to link any audio source to any video source.
85. The NVMS shall provide the ability to set a limit on the maximum bandwidth transmitted to the Control Center Client application from the Control Center Server application.
86. The NVMS shall provide the ability to automatically log in to an NVR.
87. The NVMS shall provide the ability to monitor user access to each server cluster.
88. The NVMS shall provide the ability to override user access to an NVR.

89. The NVMS shall provide the ability to automatically log out of an NVR when the application is left idle.
90. The NVMS shall provide the ability to save and restore the window layout.
91. The NVMS shall provide the ability to control the system using a PC keyboard or joystick.
92. The NVMS shall provide the ability to import and export client settings such as maps, views, and web pages.
93. The NVMS shall support live or recorded video monitoring of 1 to 36 video streams simultaneously on a single monitor with the following standard layouts:
 - a. Full Screen
 - b. 2 x 2
 - c. 3 x 3
 - d. 4 x 4
 - e. 5 x 5
 - f. 6 x 6
 - i. 1+ 12
 - j. 2 + 8
94. The NVMS shall support live or recorded video monitoring in a customizable video display beyond the standard layouts.
95. The NVMS shall support the ability to bias the displayed video to a higher frame rate or to a lower image resolution if the client network bandwidth or client processing power is insufficient to display the full frame rate and image resolution.
96. The NVMS shall support the ability to display the following list of image overlays including but not limited to:
 - a. Camera Name
 - b. Camera Location
 - c. Timestamp
 - d. Record Indicator
 - e. Motion Activity
 - f. License Plate
97. The NVMS shall support an unlimited number of monitors for monitoring video and audio streams.
98. The Network Video Management Software (NVMS) shall have the ability to share the application window display in a joint session with other users for collaborative investigations while viewing both live and recorded video.
99. The NVMS shall support monitoring live and recorded video and audio streams simultaneously on the same monitor.
100. The Network Video Management Software (NVMS) shall offer a Matrix Application Module to provide remote control of multiple monitor displays, including video walls, that can be controlled by an unlimited number of users with appropriate rights and permissions.
101. The NVMS shall support viewing the same live or recorded video stream at different zoom levels and areas of interest.
102. The NVMS shall support the ability to switch from live to recorded video on demand for an instant replay of recently recorded video.
103. The NVMS shall support the creation of unlimited views with unique layouts of video streams.
104. The NVMS shall support the ability to full-screen a view.
105. The NVMS shall support the ability to save views.
106. The NVMS shall support the ability to cycle through views (guard tour) based on a specified interval.
107. The NVMS shall display all video sources connected to the system.
108. The NVMS shall support the ability to drag and drop a video source from a tree of video sources into a window for live or recorded video and audio monitoring.
109. The NVMS shall support the ability to drag and drop a view from a tree of views into a window for live or recorded video and audio monitoring.
110. The NVMS shall support the ability to configure how the tree of video sources and views is displayed.
111. The NVMS shall support the ability to designate one or more regions in a window for displaying video directly linked to triggered alarms and rules.

112. The NVMS shall support the ability to acknowledge alarms from the designated video display area.
113. The NVMS shall support the ability to manually trigger digital output.
114. The NVMS shall support the ability to create a map that represents the physical location of cameras and other devices throughout the surveillance system. Maps shall be created from images stored in JPEG, BMP, PNG, or GIF image formats. Maps shall have the ability to contain links so as to create a hierarchy of interlinked maps.
115. The NVMS shall support the ability to create an HTML-based map that has a link to a section of the entire image region.
116. The NVMS shall support the ability to drag and drop a video source from a map into a window for live or recorded video and audio monitoring.
117. The NVMS shall highlight a camera on a map when an alarm linked to the camera is triggered.
118. The NVMS shall highlight a linked map that contains a camera when an alarm linked to the camera is triggered.
119. The NVMS shall support the ability to save a link to a web page and view the web page in a window.
120. The NVMS shall support digital zooming and panning on live and recorded video streams.
121. The NVMS shall support controlling mechanical pan-tilt-zoom, iris, and focus as well as setting presets and patterns.
122. The NVMS shall provide the ability to name pan-tilt-zoom presets.
123. The NVMS shall support the ability to create guard tours by combining a set number of presets that are run in sequence or random.
124. The NVMS shall support the ability to center a PTZ camera's field of view by clicking anywhere on the video image.
125. The NVMS shall support the ability to click and drag to define an area for the PTZ camera to optically zoom and center on.
126. The NVMS shall support controlling mechanical pan-tilt-zoom camera on-screen display and auxiliary controls.
127. The NVMS shall support locking PTZ controls.
128. The NVMS shall support control of a mechanical pan-tilt-zoom camera with a USB joystick.
129. The NVMS shall support forward and reverse playback of recorded video and audio at variable speeds.
130. The NVMS shall synchronously playback recorded video and audio from selected video sources.
131. The NVMS shall support navigation of recorded video and audio via calendar, timeline, or events.
132. The NVMS shall support a timeline that displays all connected video sources and the corresponding motion and recording events.
133. The NVMS shall support a timeline that can display the entire time range down to one second of recorded video and audio.
134. The Network Video Management Software (NVMS) shall have a quick access search for connected camera, encoders, sites, maps, saved views, web pages and virtual matrix monitors.
It shall be possible to search all items by, but not limited to:
 - 1) Name
 - 2) Location
 - 3) Logical ID
 - 4) Serial Number
 - 5) IP address
135. The NVMS shall support creating bookmarks for recorded video and audio from multiple sources, displaying the bookmarks on the timeline, and searching for bookmarks.
136. The NVMS shall support protecting a bookmark so the video and audio data is never overwritten.
137. The NVMS shall support monitoring alarms.
138. The NVMS shall support the ability to assign alarms to users.
139. The NVMS shall support the ability to acknowledge alarms.
140. The NVMS shall support the ability to bookmark alarms.
141. The NVMS shall support searching through bookmarks based on various search criteria including bookmark name, notes, and linked camera names.
142. The NVMS shall support searching through recorded video and audio based on various search criteria including time, date, video source, and events.

112. The NVMS shall support the ability to acknowledge alarms from the designated video display area.
113. The NVMS shall support the ability to manually trigger digital output.
114. The NVMS shall support the ability to create a map that represents the physical location of cameras and other devices throughout the surveillance system. Maps shall be created from images stored in JPEG, BMP, PNG, or GIF image formats. Maps shall have the ability to contain links so as to create a hierarchy of interlinked maps.
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118. The NVMS shall highlight a linked map that contains a camera when an alarm linked to the camera is triggered.
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133. The NVMS shall support a timeline that can display the entire time range down to one second of recorded video and audio.
134. The Network Video Management Software (NVMS) shall have a quick access search for connected camera, encoders, sites, maps, saved views, web pages and virtual matrix monitors.
 It shall be possible to search all items by, but not limited to:
 - 1) Name
 - 2) Location
 - 3) Logical ID
 - 4) Serial Number
 - 5) IP address
135. The NVMS shall support creating bookmarks for recorded video and audio from multiple sources, displaying the bookmarks on the timeline, and searching for bookmarks.
136. The NVMS shall support protecting a bookmark so the video and audio data is never overwritten.
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139. The NVMS shall support the ability to acknowledge alarms.
140. The NVMS shall support the ability to bookmark alarms.
141. The NVMS shall support searching through bookmarks based on various search criteria including bookmark name, notes, and linked camera names.
142. The NVMS shall support searching through recorded video and audio based on various search criteria including time, date, video source, and events.

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DPS Command Center and Surveillance System

Scope of Work

Project Summary:

Security Systems Integrator will provide and install an enterprise level video management system (VMS) to upgrade the existing CCTV analog video surveillance system at the West Virginia State Capitol facility. Other enhancements include a new video wall, command console and collaboration workstation station. The turn-key installation will be a phased approach in order to maintain a functional command center at all times. Work is to be performed by a certified security integrator only.

The goal of this project is to migrate and control the existing analog cameras to an open architecture state of the art digital recording system. The video management system (VMS) must be recorded on an upgradable embedded windows server based platform with optimized raid 5 storage as a minimum. In addition to the standard 1 to 8 megapixel cameras, the VMS must support 16 to 30 megapixels IP cameras with integrated reference based analytics. (See *specification for details*) The VMS must integrate with the Command Center existing access control system Lenel/Facility Commander Wnx/OnGuard via software control. VMS must be compatible with "all in one" PC - 55 inch or greater touch screen, build in video conferencing codecs, annotation, dual Wi-Fi based collaboration workstation. (See *specification for details*)

Phasing:

Phase 1 begins with migrating the analog video to IP, which includes installing Coaxitron converter, 4 channel video encoders, servers, switches, UPS, IP based UPS/KVM switch with integrated work monitor and keyboard and collaboration workstations. The console collaboration workstation will include UTC/Facility Commander/lenel Onguard and CCTV VMS client software for viewing, control and integration of card access and IP CCTV systems. Upon completion of the video migration operator training will be performed. Security Systems Integrator will assist and train the division of protective services in setting up the initial camera views for the legacy base of camera by manufacturer as follows:

GE PTZ	60
Pelco PTZ	28
GE Fixed	43
Pelco Fixed	46

Training will be on site and will cover multiple shifts. There will be at least four different in time training sessions. At a minimum 12 people will be trained over the four sessions.

Phase 2 Security Systems Integrator will assist Division of Protective Services (DPS) in setting up temporary equipment and collaboration workstation necessary to run a remote command center. DPS must have access as a minimum to monitor card access system, CCTV feeds, weapons terminal, and radios. Temporary command/control center will be located in room outside of the existing DPS command center. Security Systems Integrator will require a desk to locate the collaboration workstation. Security Systems Integrator will provide network connection to existing DPS command center servers for card access and CCTV servers. Once temporary command center is in operation phase 3 can commence.

Phase 3 Security Systems Integrator must disassemble existing console and relocate to destination on-site as requested by DPS. Security Systems Integrator will provide and install new console for command center personnel as per specifications. Security integrator will provide a video wall consisting of 8 - commercial grade 40 inch monitors designed for continuous use, located 18 inches in front of the new console workstations. Security Systems Integrator will reuse part of existing console to maintain section pertaining to bollard controls, located as per drawing. Each of the two operator work areas will have five monitors mounted as per drawing. Security Systems Integrator will repurpose 8 existing 19 inch console monitors to these locations and provide 1 new 24" HD commercial continuous use monitor for VMS viewing video. A VMS/card access collaboration workstation will be located at each operator workstation. These will be used for controlling the video wall servers and live/playback video.

Video analytics will be deployed in several areas to assist with notification of people or a vehicle in a given area of interest. The VMS must utilize reference based analytics to ID a person or a vehicle in a given zone in a given time. Video analytic based encoders with storage will be used at the Laidley parking lot and parking garage. *(See Specification sections for full details)* The video from the Laidley parking lot and parking garage encoders will be connected back to the VMS server via a new high-speed commercial grade 5.8 Ghz wireless network. The systems integrator will perform a wireless survey and provide results in written form to DPS. The solution will provide a minimum of 100 Mbs of sustainable connectivity.

The system must provide adequate raid 5 storage for a minimum of 30 days at 30 FPS/high quality/50 % motion/max resolution per camera/encoder. Events of interest will be exported to owner provided permanent storage for future review.

System training will be provided for DPS personnel who will be granted access to review and export video. Security Systems Integrator will train management on setting up VMS users, granting access rights and configuring video wall display layouts after installation is complete and tested. Security Systems Integrator will train system operators on collaboration workstation, VMS software operation, remote control via table/smart phone, application loading, digital interactive whiteboard/document annotation and business-class video conferencing. Training will be on site and will cover multiple shifts. There will be at least four different in time training sessions. At a minimum 12 people will be trained over the four sessions.

Scope of Work:

- SECURITY SYSTEMS INTEGRATOR will furnish project equipment literature, all cable for interconnections, video adapters, rack mounts for encoders, mounts, video servers, data switches, control translators, workstation computers, and video wall computers, and any other parts as needed to provide a complete and working system as described herein.
- SECURITY SYSTEMS INTEGRATOR will furnish installation material, ladders, or tools as needed *Exception Note (If a lift is required to get to a camera that requires its protocol to be changed in order to function properly said lift will be provided by others)
- SECURITY SYSTEMS INTEGRATOR to properly label both ends of any new cables and maintain schedule of cable ID.
- SECURITY SYSTEMS INTEGRATOR will test and document all new cables.
- SECURITY SYSTEMS INTEGRATOR will prepare connection to Owner's LAN and assign IP addresses as directed by IT.
- SECURITY SYSTEMS INTEGRATOR will perform all work in a workmanlike manner, following all safety requirements and will report in and out as they perform work.
- SECURITY SYSTEMS INTEGRATOR will perform all in a phased approach as describe herein.

- SECURITY SYSTEMS INTEGRATOR will build basic configuration for video wall and train DPS how to add additional views of their choice
- SECURITY SYSTEMS INTEGRATOR will configure a user account, an administrator account and train DPS on how to add additional users.
- This work will be performed during normal business hours per schedule approved in advance by DPS
- Work will be performed as follows;
 1. SECURITY SYSTEMS INTEGRATOR to review schedule and installation plan with DPS including any diagrams, drawings and equipment literature.
 2. SECURITY SYSTEMS INTEGRATOR will order equipment as per purchase order and release to work.
 3. SECURITY SYSTEMS INTEGRATOR will setup equipment in insured facility, test equipment, and program to prep equipment prior to onsite delivery.
 4. DPS representative to visit prep facility to validate preparation
 5. DPS installs RECESSED 3 duplex - 120V/20amp power boxes on the video wall to hide behind the monitors and one abnormal off the floor.
 6. SECURITY SYSTEMS INTEGRATOR will visit site to test circuits and begin attaching equipment to server(s).
 7. SECURITY SYSTEMS INTEGRATOR performs phased approach as described for migration and installation of equipment
 8. SECURITY SYSTEMS INTEGRATOR to preform final programming and set up as per schedule
 9. SECURITY SYSTEMS INTEGRATOR performs final systems configuration, testing and operational inspection prior to training
 10. At completion and per schedule approved in advance by DPS, SECURITY SYSTEMS INTEGRATOR will provide onsite operational training of the system for authorized DPS personnel.
- SECURITY SYSTEMS INTEGRATOR will provide As-Built CAD cable diagrams showing circuit routing and equipment locations on drawings and turn over to DPS upon completion.

Notes and Exclusions:

- Owner shall be responsible to identify and properly remove any asbestos or other hazardous materials prior to installation work.
- DPS to furnish any additional 120VAC circuit(s) as needed
- DPS to furnish any additional lifts as needed to install, test, modify or maintain camera system
- DPS to provide internet service needed to support camera system remotely
- DPS to assign a responsible liaison to work with SECURITY SYSTEMS INTEGRATOR regarding scheduling, safety training, alerts and other site specific items so the system can be set up and made operational as expected by DPS
- DPS will be the single point of contact for any construction services or work to be performed by the General Services Division of the Department of Administration

Warranty

- Two year factory sponsored equipment warranty for cameras and server(s)/recording equipment
- One year factory sponsored equipment warranty for all other equipment
- One year labor warranty

Certifications and Integrator Requirements:

Certification:

Security Systems Integrator will provide as an attachment to the bid package proof of factory certification for employee(s) for the following systems. Failure to provide all required certifications will disqualify bidder.

- UTC - Facility Commander Wnx
- UTC - Lenel Onguard
- Avigilon - ACC VMS

- Cisco – (CCNA) Cisco Certified Network Associate Routing & Switching Certification

References:

3 References of similar size and scope are required by all bidders prior to the award of the contract.

Service:

Security Systems Integrator will maintain a service organization that offers 24/7/365 on call technicians with a 4 hour response rate. Spare parts must be kept in service depot located with 15 miles of the capitol.

Video Management System (VMS)

NETWORK VIDEO MANAGEMENT SOFTWARE (NVMS)

1. Avigilon
 - a. No substitutions will be accepted
 - b. Contractor shall provide all applicable Network Video Management Software (NVMS) modules and licenses required to provide a complete and fully functional integration.
 - c. The NVMS shall be installed on hardware which meet or exceed the manufacturer’s recommended requirements:
 - d. The NVMS basis of design is the Avigilon Control Center (ACC) version 5.x. The design and performance requirements for the NVMS software are as follows:
 - e. The NVMS shall be available as a stand-alone software offering or pre-loaded on turn-key workstations and servers running Microsoft Windows with configurable storage.
 - e. The NVMS shall be available in a licensed:
 - f. ACC 5.x “Enterprise”] Edition Supporting:
 - 1) One Hundred Twenty Eight (128) cameras per server
 - 2) One Hundred (100) servers per site
 - 3) Unlimited concurrent site connections
 - 4) Unlimited client licenses
3. The NVMS shall be an enterprise level software solution that shall be scalable from one client, server, and camera to hundreds of clients, servers, and cameras.
4. The NVMS shall consist of server software applications and client software applications.
5. The NVMS shall include a gateway software application that connects mobile devices to the NVMS.
6. The NVMS shall support HDSM (High Definition Stream Management) for local and remote users and mobile devices.
7. The NVMS mobile client shall be supported by Android and Apple mobile devices.
8. The NVMS shall be available in the following languages:
 - a. English
9. The NVMS shall include but not limited to the following applications:
 - a. Server Software Applications
 - 1) Control Center Server
 - 2) Control Center Admin Tool
 - 3) Control Center Gateway
 - b. Client Software Applications
 - 1) Control Center Client
 - 2) Control Center Virtual Matrix
 - 3) Control Center Web Client
 - 4) Control Center Player
 - 5) Control Center Camera Installation Tool
 - 6) Control Center Mobile
10. The NVMS shall permit server and client software applications to be installed and run on both the same computer or on separate computers.
11. The NVMS shall support storage and processing of video and audio.

- a. Audio and video must be recorded natively from the camera with no transcoding.
 - b. Audio and video must be synchronized regardless of frame-rate, resolution or bitrate.
12. The NVMS shall support High Definition Stream Management (HDSM) architecture which includes:
- a. Support for the industry standards of JPEG2000, MJPEG, MPEG-4, and H.264 compression formats
 - b. Support for reducing the required client bandwidth and processing power by only transmitting what is necessary to view the video stream at full quality (e.g. if a user is viewing a 16MP camera in a 1MP window then a 1MP representation of the 16MP image shall be transmitted).
 - c. Support for quality “data-aging”, enabling a low quality and high quality stream to be recorded under the same logical ID. After an administrator defined period of time, the higher stream would be deleted and the lower stream would remain until the end of the desired retention period.
 - d. Support for frame “data-aging”, enabling the ability to reduce the image rate of recorded JPEG and JPEG2000 video over time as a means of increasing record time. After an administrator defined period of time, the image rate shall be able to be reduced to one half or one quarter of the original image rate.
13. The Network Video Management Software (NVMS) shall support recording and management of video and audio sources including but not limited to:
- a. Avigilon HD Cameras (1 – 5 Megapixel) or equal
 - b. Avigilon HD Dome Cameras (1 – 5 Mega pixels) or equal
 - c. Avigilon Panoramic HD Dome Cameras (8 Megapixel) or equal
 - d. Avigilon Day/Night H.264 HD Cameras (1– 5 Megapixel) or equal
 - e. Avigilon Day/Night H.264 HD Dome Cameras (1– 5 Megapixel) or equal
 - f. Avigilon HD Bullet Cameras (1– 5 Megapixel) or equal
 - g. Avigilon HD Micro Dome Cameras (1– 2 Megapixel) or equal
 - h. Avigilon HD Pro Cameras (8 – 30 Megapixel) or equal
 - i. Avigilon Day/Night HD PTZ Dome Camera (1–2 Megapixel) or equal
 - j. Composite video from analog cameras, PTZ domes and thermal imagers via Avigilon ENC-4P-H264 analog encoders or equal.
 - k. ACTi Cameras/Encoders
 - l. Arecont Cameras
 - m. Axis Cameras/Encoders
 - n. IQInvision Cameras
 - o. Mobotix Cameras
 - p. ONVIF 1.00, 1.01, and 1.02 Cameras
 - q. ONVIF Profile S Cameras
 - r. Panasonic Cameras
 - s. Pelco Cameras
 - t. Samsung Cameras/Encoders
 - u. Samsung Techwin cameras
 - v. Sanyo Cameras
 - w. Scallop Cameras
 - x. Sightlogix Cameras
 - y. Sony Cameras
 - z. VideoIQ Cameras/Encoders
14. The NVMS shall support receiving digital input triggers and triggering digital outputs through an I/O board.
15. The NVMS shall support recording and monitoring video and audio streams from sources with bandwidth up to 90 Mbit/sec, frame rate up to 60 fps, and video resolution up to 29 MP (6576 x 4384).
16. The NVMS shall support the decompression of H.264 video through the client graphics card/graphical processing unit instead of using the client processing power.
17. The NVMS shall require no proprietary recording hardware, no hardware multiplexer or time-division technology for video and audio recording or monitoring.
18. The NVMS shall not limit the storage capacity and shall allow for upgrades of recording capacity.

19. The NVMS shall digitally sign recorded video and audio using 256-bit encryption so video can be authenticated for evidentiary purposes.
20. The NVMS shall securely transmit all command and control data via TCP/IP using cryptographic keys based on SSL to prevent eavesdropping or tampering.
21. The NVMS will provide the mechanism by which individual alarm(s) from external systems can be pre-selected and configured to be monitored and, in turn, trigger event driven video operations.
22. The NVMS shall support software level integration via an Application Programming Interface (API). The API integration should include but not limited to:
 - a. Bi-directional alarm event processing for monitoring and acknowledgement
 - b. Receiving card access activity events
 - c. Receiving digital input events
 - d. Receiving intrusion zone events
23. Occurrences for "Alarm" and "Reset" conditions for each of the pre-selected Access system alarms will be processed and managed from the NVMS system's Live View workspace that is reserved for displaying alarm notifications in the alarm list message pane or from an alarm viewer. If the Alarm pane is hidden, the alarm can be acknowledged from the Camera display tile.
24. Once an Access system initiated alarm occurrence is acknowledged from the NVMS system, it should be automatically acknowledged and processed in the Access System alarm monitor queue without further operator intervention.
25. The NVMS shall support integration with the following systems:
 - a. GE Security Facility Commander Wnx v7.x platform
 - b. Lenel OnGuard
26. The NVMS shall be capable of being upgraded from one version to another without having to uninstall the previous version.
27. The NVMS shall be capable of being upgraded from one edition to another without having to uninstall the application.
28. The NVMS shall be capable of being upgraded from one edition to another without losing system configuration information or archived video.
29. The NVMS shall automatically detect if video or audio source firmware is out of date with respect to the current installed software and upgrade it.
30. The NVMS shall automatically detect if client application software is out of date with respect to the current installed server software and upgrade it.
31. The NVMS shall run as a service configured to automatically start when the server or workstation is powered on and automatically recover from failure or attempted tampering.
32. The NVMS shall allow system administration, and live and recorded video and audio monitoring all from a single client application that can be located anywhere on the network.
33. The NVMS shall automatically discover all Server instances running on computers connected to the same network as the Client.
34. The NVMS shall provide a search functionality to discover Server instances running on computers connected on a different network segment than the Client by using IP addresses or hostnames.
35. The Network Video Management Software (NVMS) shall manage and synchronize servers as a cluster with shared data and tasks to provide crash-proof enterprise server management.
36. The NVMS shall automatically discover video and audio sources that are connected to the same network as the Server.
37. The NVMS shall provide a search functionality to discover video and audio sources that are connected on a different network segment than the Server.
38. The NVMS shall provide the ability to connect a video or audio source to multiple NVRs to achieve redundant recording.
39. The NVMS shall provide the ability to create a failover connection for a video or audio source. If the NVR that the video or audio source is connected to goes offline then the failover NVR will take over the connection.
40. The NVMS shall provide administration of all system connections from a single window.

41. The NVMS shall support receiving Simple Network Management Protocol (SNMP) messages from servers and alert the user.
42. The NVMS shall detect if the video or audio signal is lost and alert the system administrator.
43. The NVMS shall provide the capability to rename all video and audio sources and NVRs.
44. The NVMS shall record video and audio streams based on a recording schedule that can be defined individually for each video source. The schedule shall be created with the following parameters to include but not limited to:
 - a. Recording Mode
 - b. Continuous
 - c. Motion
 - d. Digital Inputs
 - e. Alarms
 - f. POS Transactions
 - g. License Plates
 - h. Time and Date Settings
 - i. Daily
 - j. Weekly
45. The NVMS shall provide the ability to manually trigger recording.
46. The NVMS shall provide a pre-event and post-event recording option.
47. The NVMS shall provide a reference frame recording option in the absence of events.
48. The NVMS shall perform motion detection on each individual video source with adjustable sensitivity, threshold and detection zones.
49. The NVMS shall provide the ability to record and maintain a primary and secondary video stream for a set amount of time before the primary stream is discarded as a means of increasing record time. This setting can be configured separately for each H.264 video source.
50. The NVMS shall provide the ability to set a maximum recorded video retention time for each video source.
51. The NVMS shall perform dynamic bandwidth management to ensure that the total bandwidth does not overload the system.
52. The NVMS shall authenticate users before granting access to the system. Access rights for each user can be defined individually for each user, and shall include but not limited to:
 - a. View live images
 - 1) Use PTZ controls
 - 2) Lock PTZ controls
 - 3) Trigger manual recording
 - 4) Trigger digital outputs
 - 5) Listen to microphones
 - 6) Broadcast to speakers
 - b. View recorded images
 - 1) Export images
 - 2) Backup images
 - c. Manage saved views
 - d. Manage maps
 - e. Manage web pages
 - f. Manage virtual matrix monitors
 - g. Initiate collaboration sessions
 - h. Manage user sessions
 - i. View server status
 - j. Setup cameras
 - 1) Setup general settings
 - 2) Setup network settings
 - 3) Setup image and display settings

- 4) Setup compression and image rate settings
- 5) Setup image dimension settings
- 6) Setup motion detection settings
- 7) Setup privacy zone settings
- 8) Setup manual recording settings
- 9) Setup digital input & output settings
- 10) Setup microphone settings
- 11) setup speaker settings
- k. Setup sites
 - 1) Setup name
 - 2) Manage site
 - 3) Setup site view
 - 4) Setup user and group settings
 - 5) Setup alarm management settings
 - 6) Setup POS transaction settings
 - 7) Setup LPR settings
 - 8) Setup email settings
 - 9) Setup rule engine settings
 - 10) View site logs
 - 11) Connect and disconnect cameras
 - 12) Import and export settings
- l. Setup servers
 - 1) Setup name
 - 2) Setup schedule settings
 - 3) Setup recording and bandwidth settings
 - 4) Setup scheduled backup settings
- m. Access to individual video and audio sources
- 53. The NVMS shall provide the ability to import members of Active Directory groups as users in the NVMS. Changes made to members in the Active Directory are automatically synced with the NVMS.
- 54. The NVMS shall optionally support using Windows credentials to authenticate users.
- 55. The NVMS shall provide the ability to create and schedule alarms.
- 56. The NVMS shall provide the ability to schedule backups of recorded video with associated events to a local folder or mapped network drive.
- 57. The NVMS shall provide the ability to email users and system administrators when an event or system health error occurs.
- 58. The NVMS shall provide the ability to schedule when email notifications are sent.
- 59. The NVMS shall provide the ability to include camera images in email notifications.
- 60. The NVMS shall maintain an event log for the following events to include but not limited to:
 - a. Server Events
 - 1) Server application starting up
 - 2) Server application shutting down
 - 3) Server application terminated unexpectedly
 - 4) Server application low on resources
 - 5) Server application installation error
 - 6) License expires soon
 - 7) License expired
 - 8) Database error
 - 9) Data initialization error
 - 10) Data volume failed
 - 11) Data volume recovered
 - 12) Data volume size reduced

- 13) Data write error
- 14) Data upgrade started
- 15) Data upgrade completed
- 16) Data upgrade failed
- 17) Data recovery started
- 18) Data recovery completed
- 19) Data recovery failed
- 20) Bookmark save failed
- 21) Network connection found
- 22) Network connection lost
- 23) Email send error
- 24) Server hardware error
- 25) Backup started
- 26) Backup completed
- 27) Backup failed
- 28) Server connection lost

b. Device Events

- 1) Connection created
- 2) Connection removed
- 3) Connection created to standby server
- 4) Connection removed from standby server
- 5) Connection failure
- 6) Connection restored
- 7) Network packet loss unacceptable
- 8) Network packet loss acceptable
- 9) Motion detection started
- 10) Motion detection ended
- 11) Recording started
- 12) Recording ended
- 13) Recording interrupted
- 14) Recording resumed
- 15) Digital input activated
- 16) Digital input deactivated
- 17) Firmware upgrade started
- 18) Firmware upgrade completed
- 19) Firmware upgrade failed

c. User Events

- 1) User login
- 2) User logout
- 3) Server setting changed
- 4) Site setting changed
- 5) Device setting changed
- 6) Device connected
- 7) Device disconnected
- 8) Digital output triggered
- 9) Bookmark added
- 10) Bookmark updated
- 11) Bookmark deleted
- 12) PTZ moved
- 13) PTZ idle
- 14) Export performed

- 15) Speaker activated
- 16) Speaker deactivated
- 17) Virtual matrix monitor opened
- 18) Map added
- 19) Map updated
- 20) Map deleted
- 21) View added
- 22) View updated
- 23) View deleted
- 24) Web Page added
- 25) Web Page updated
- 26) Web Page deleted
- d. Alarm Events
 - 1) Alarm acknowledged
 - 2) Alarm auto acknowledged
 - 3) Alarm triggered
 - 4) Alarm assigned
 - 5) Alarm unassigned
 - 6) Alarm purged
- e. POS Transaction Events
 - 1) POS transaction started
 - 2) POS transaction ended
 - 3) POS transaction exception
- f. License Plate Recognition Events
 - 1) License plate detection started
 - 2) License plate detection ended
 - 3) License plate watch-list match
- 61. The NVMS shall have the capability to schedule and execute any of the following actions in response to any of the events listed above:
 - a. User Notification Actions
 - 1) Display on-screen message
 - 2) Send an email
 - 3) Play a sound
 - b. Monitoring Actions
 - 1) Start live streaming video
 - 2) Create Bookmark
 - 3) Open a saved view
 - 4) Start live streaming on a virtual matrix monitor
 - 5) Open a map on a virtual matrix monitor
 - 6) Open a web page on a virtual monitor
 - c. Device Actions
 - 1) Reboot camera
 - 2) Trigger digital output
 - d. PTZ Actions
 - 1) Go to Preset
 - 2) Run a Pattern
 - 3) Set Auxiliary
 - 4) Clear Auxiliary
 - e. Alarm actions
 - 1) Trigger an alarm
 - 2) Acknowledge an alarm

62. The NVMS shall provide the ability to create customized on-screen messages and email notifications.
63. The NVMS shall combine and list all on-screen messages in one location and color code the importance of each message.
64. The NVMS shall provide a maintenance log and audit trail of all system errors and events.
65. The NVMS shall report the status of all connected servers within a cluster and provide the option to export the information in PDF format.
66. The NVMS shall provide the ability to receive transaction information from point-of-sale sources.
67. The NVMS shall support multiple encoding formats from point-of-sale sources.
68. The NVMS shall provide the ability to monitor live and recorded transactions from point-of-sale sources with linked video.
69. The NVMS shall provide the ability to generate events based on point-of-sale transaction exceptions.
70. The NVMS shall provide the ability to define a region of an image where license plate detection is performed. Detected license plates shall be stored along with the video data.
71. The NVMS shall provide the ability to create a watch-list that will be used to create events when any license plate on the watch-list is detected in the images being analyzed.
72. The NVMS shall provide the ability to enable and configure PTZ control on the RS-485 interface of a video source.
73. The NVMS shall support the following list of PTZ camera protocols to include but not limited to:
 - a. American Dynamics Sensormatic
 - b. AXSYS
 - c. AXSYS DCU
 - d. Ernitec ERNA
 - e. Honeywell Diamond
 - f. Kalatel ASCII
 - g. Pelco D
 - h. Pelco P
 - i. TEB Ligne
 - j. Vicon extended
 - k. Vicon normal
 - l. Videotec Legacy
 - m. Videotec MACRO
74. The NVMS shall provide the ability to change the network settings for a video and audio source.
75. The NVMS shall provide the ability to change image quality and image rate parameters for a video source without affecting the settings on the other video sources.
76. The NVMS shall provide the ability to enable a secondary stream for live viewing.
77. The NVMS shall provide the ability to change the exposure, iris, IR filter, backlight compensation, gain, priority, sharpening, saturation, focus, and white balance settings for a video source.
78. The NVMS shall provide the ability to change the image dimensions for a video source.
79. The NVMS shall provide the ability to rotate the image 90°, 180° or 270° for a video source.
80. The NVMS shall provide the ability to add privacy zones to a video source to block unwanted areas in the image field of view.
81. The NVMS shall provide the ability to set a maximum recording duration for manually triggered recording for a video source.
82. The NVMS shall provide the ability to change the input, output, gain and volume for an audio source.
83. The NVMS shall provide for full-duplex two-way audio communication.
84. The NVMS shall provide the ability to link any audio source to any video source.
85. The NVMS shall provide the ability to set a limit on the maximum bandwidth transmitted to the Control Center Client application from the Control Center Server application.
86. The NVMS shall provide the ability to automatically log in to an NVR.
87. The NVMS shall provide the ability to monitor user access to each server cluster.
88. The NVMS shall provide the ability to override user access to an NVR.

89. The NVMS shall provide the ability to automatically log out of an NVR when the application is left idle.
90. The NVMS shall provide the ability to save and restore the window layout.
91. The NVMS shall provide the ability to control the system using a PC keyboard or joystick.
92. The NVMS shall provide the ability to import and export client settings such as maps, views, and web pages.
93. The NVMS shall support live or recorded video monitoring of 1 to 36 video streams simultaneously on a single monitor with the following standard layouts:
 - a. Full Screen
 - b. 2 x 2
 - c. 3 x 3
 - d. 4 x 4
 - e. 5 x 5
 - f. 6 x 6
 - i. 1 + 12
 - j. 2 + 8
94. The NVMS shall support live or recorded video monitoring in a customizable video display beyond the standard layouts.
95. The NVMS shall support the ability to bias the displayed video to a higher frame rate or to a lower image resolution if the client network bandwidth or client processing power is insufficient to display the full frame rate and image resolution.
96. The NVMS shall support the ability to display the following list of image overlays including but not limited to:
 - a. Camera Name
 - b. Camera Location
 - c. Timestamp
 - d. Record Indicator
 - e. Motion Activity
 - f. License Plate
97. The NVMS shall support an unlimited number of monitors for monitoring video and audio streams.
98. The Network Video Management Software (NVMS) shall have the ability to share the application window display in a joint session with other users for collaborative investigations while viewing both live and recorded video.
99. The NVMS shall support monitoring live and recorded video and audio streams simultaneously on the same monitor.
100. The Network Video Management Software (NVMS) shall offer a Matrix Application Module to provide remote control of multiple monitor displays, including video walls, that can be controlled by an unlimited number of users with appropriate rights and permissions.
101. The NVMS shall support viewing the same live or recorded video stream at different zoom levels and areas of interest.
102. The NVMS shall support the ability to switch from live to recorded video on demand for an instant replay of recently recorded video.
103. The NVMS shall support the creation of unlimited views with unique layouts of video streams.
104. The NVMS shall support the ability to full-screen a view.
105. The NVMS shall support the ability to save views.
106. The NVMS shall support the ability to cycle through views (guard tour) based on a specified interval.
107. The NVMS shall display all video sources connected to the system.
108. The NVMS shall support the ability to drag and drop a video source from a tree of video sources into a window for live or recorded video and audio monitoring.
109. The NVMS shall support the ability to drag and drop a view from a tree of views into a window for live or recorded video and audio monitoring.
110. The NVMS shall support the ability to configure how the tree of video sources and views is displayed.
111. The NVMS shall support the ability to designate one or more regions in a window for displaying video directly linked to triggered alarms and rules.

112. The NVMS shall support the ability to acknowledge alarms from the designated video display area.
113. The NVMS shall support the ability to manually trigger digital output.
114. The NVMS shall support the ability to create a map that represents the physical location of cameras and other devices throughout the surveillance system. Maps shall be created from images stored in JPEG, BMP, PNG, or GIF image formats. Maps shall have the ability to contain links so as to create a hierarchy of interlinked maps.
115. The NVMS shall support the ability to create an HTML-based map that has a link to a section of the entire image region.
116. The NVMS shall support the ability to drag and drop a video source from a map into a window for live or recorded video and audio monitoring.
117. The NVMS shall highlight a camera on a map when an alarm linked to the camera is triggered.
118. The NVMS shall highlight a linked map that contains a camera when an alarm linked to the camera is triggered.
119. The NVMS shall support the ability to save a link to a web page and view the web page in a window.
120. The NVMS shall support digital zooming and panning on live and recorded video streams.
121. The NVMS shall support controlling mechanical pan-tilt-zoom, iris, and focus as well as setting presets and patterns.
122. The NVMS shall provide the ability to name pan-tilt-zoom presets.
123. The NVMS shall support the ability to create guard tours by combining a set number of presets that are run in sequence or random.
124. The NVMS shall support the ability to center a PTZ camera's field of view by clicking anywhere on the video image.
125. The NVMS shall support the ability to click and drag to define an area for the PTZ camera to optically zoom and center on.
126. The NVMS shall support controlling mechanical pan-tilt-zoom camera on-screen display and auxiliary controls.
127. The NVMS shall support locking PTZ controls.
128. The NVMS shall support control of a mechanical pan-tilt-zoom camera with a USB joystick.
129. The NVMS shall support forward and reverse playback of recorded video and audio at variable speeds.
130. The NVMS shall synchronously playback recorded video and audio from selected video sources.
131. The NVMS shall support navigation of recorded video and audio via calendar, timeline, or events.
132. The NVMS shall support a timeline that displays all connected video sources and the corresponding motion and recording events.
133. The NVMS shall support a timeline that can display the entire time range down to one second of recorded video and audio.
134. The Network Video Management Software (NVMS) shall have a quick access search for connected camera, encoders, sites, maps, saved views, web pages and virtual matrix monitors.
 - It shall be possible to search all items by, but not limited to:
 - 1) Name
 - 2) Location
 - 3) Logical ID
 - 4) Serial Number
 - 5) IP address
135. The NVMS shall support creating bookmarks for recorded video and audio from multiple sources, displaying the bookmarks on the timeline, and searching for bookmarks.
136. The NVMS shall support protecting a bookmark so the video and audio data is never overwritten.
137. The NVMS shall support monitoring alarms.
138. The NVMS shall support the ability to assign alarms to users.
139. The NVMS shall support the ability to acknowledge alarms.
140. The NVMS shall support the ability to bookmark alarms.
141. The NVMS shall support searching through bookmarks based on various search criteria including bookmark name, notes, and linked camera names.
142. The NVMS shall support searching through recorded video and audio based on various search criteria including time, date, video source, and events.

143. The NVMS shall support searching through recorded video based on motion in user defined areas (pixel search).
144. The NVMS shall support searching through recorded video based on time, date, video source, and image region and have the results displayed as a series of thumbnail images.
145. The NVMS shall support searching through recorded video based on alarm events.
146. The NVMS shall support searching through recorded video based on point-of-sale transaction events.
147. The NVMS shall support searching through recorded video based on license plates detected in the images of the video source.
148. The NVMS shall support the ability to export recorded video in the following formats including but not limited to:
 - a. Native
 - b. JPEG
 - c. PNG
 - d. TIFF
 - e. AVI
 - f. WAV
 - g. PDF
 - h. Print
149. The NVMS shall support the ability to export recorded audio in WAV format.
150. The NVMS shall support the ability to take a snapshot of a live or recorded image and export it from the system.
151. The NVMS shall support the ability to export a live stream of images in the following formats including but not limited to:
 - a. JPEG
 - b. PNG
 - c. TIFF
152. The NVMS shall support the ability to export video from multiple camera streams in Native format.
153. The NVMS shall support reviewing video and audio that was exported in the Native format.
154. The NVMS shall provide the camera properties and time zone for video exported in Native format.
155. The NVMS shall support authenticating video that was exported in the Native format to validate that it was not tampered with.
156. The NVMS shall support converting video that was exported in the Native format to an industry standard format.
157. The NVMS shall support reviewing video and audio stored in a backup.
158. The NVMS shall support exporting of video in lower frame-rates than originally recorded.
159. The NVMS shall support optionally exporting video representing a designated area of interest from within the camera's field of view.

VMS Collaboration Workstation (Location - command center W/S)

Must include the following

1. Integrate HDMI output to VMS input for event recording
2. VMS software control client
3. IOs and Android app for field collaboration and streaming video to command center
4. Remote control of display via table/smart phone
5. HDMI to RTSP converter module
6. Display 1080i, 1080p, NTSC,
7. Resolution Full HD 1920 × 1080, 1 billion,
8. View angle 176 deg.
9. Multitouch 4 camera
10. Interactive whiteboard
11. On screen Annotation
12. All in one PC i7, SSD 120GB, 8G RAM

13. Wireless: Dual band 802.11 a/b/g/n,
14. OS: Windows 7 Pro 64bit, Microsoft Office included
15. Inputs: 2- HDMI , RCA stereo, RS232, 3.5mm,
16. Video: VGA , HDMI
17. Network: Dual ethernet inputs, Dual wireless
18. HDMI Output
19. Video conferencing including as minimum codec for Cisco, Polycom, Tandberg SIP Cloud Skype, SIP, H.323, Lync, H.263, H.264
20. 1 year video conference license, cloud-based video calling service
21. 1 year technical support factory services
22. 4 – 1 hour factory training sessions by certified trainer
23. Provide 1 year extended hardware warranty

Video Wall

Monitors – Basis of design Samsung model SMT-4031 (4)

40" Commercial Grade

- | | |
|------------------------|---------------------------|
| 1. Display | |
| 2. Type - | LED |
| 3. Screen Size | 40" |
| 4. Max. Resolution | 1,920 x 1,080 |
| 5. Brightness | 350cd/m2 |
| 6. Contrast Ratio | 5,000 : 1 |
| 7. Aspect Ratio | 16 : 9 |
| 8. Viewing Angle (H/V) | 178° / 178° |
| 9. Display Color | 16.7million |
| 10. Response Time | 8ms (G to G) |
| 11. Video System | NTSC / PAL |
| 12. Panel Life | 50,000hours |
| 13. Filter Type | 3D combfilter |
| 14. Video Connector | VGA, DVI, HDMI, Component |

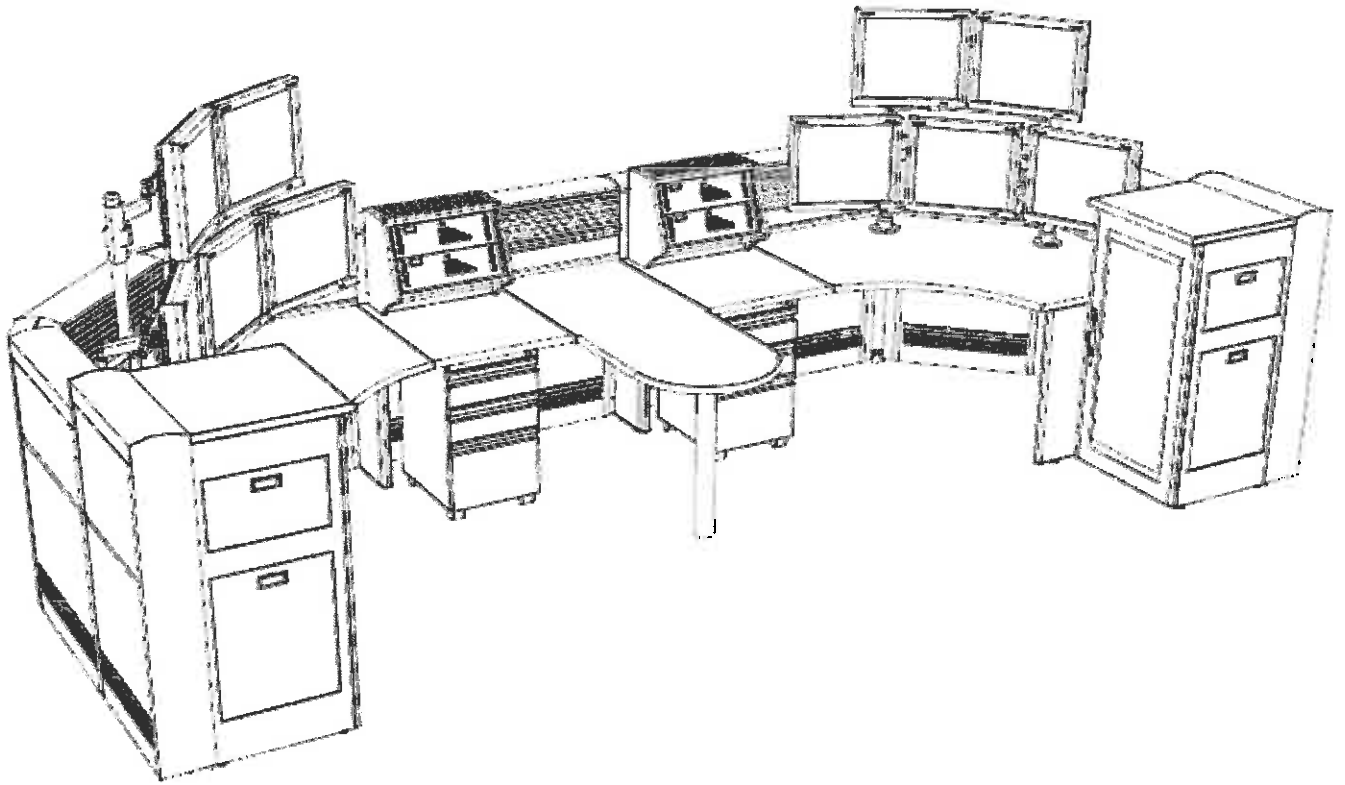
Video Wall Server/Workstations (2)

Minimum requirements

1. Dual video card - EVGA Geforce GTX 970
2. Windows 7, Windows 7 embedded or equal
3. 1 TB Drive hard drive
4. 1000W power supply
5. AS ROCK motherboard
6. Intel I7 - six core 3.3 GHz
7. Wireless keyboard
8. Wireless mouse
9. USB extender

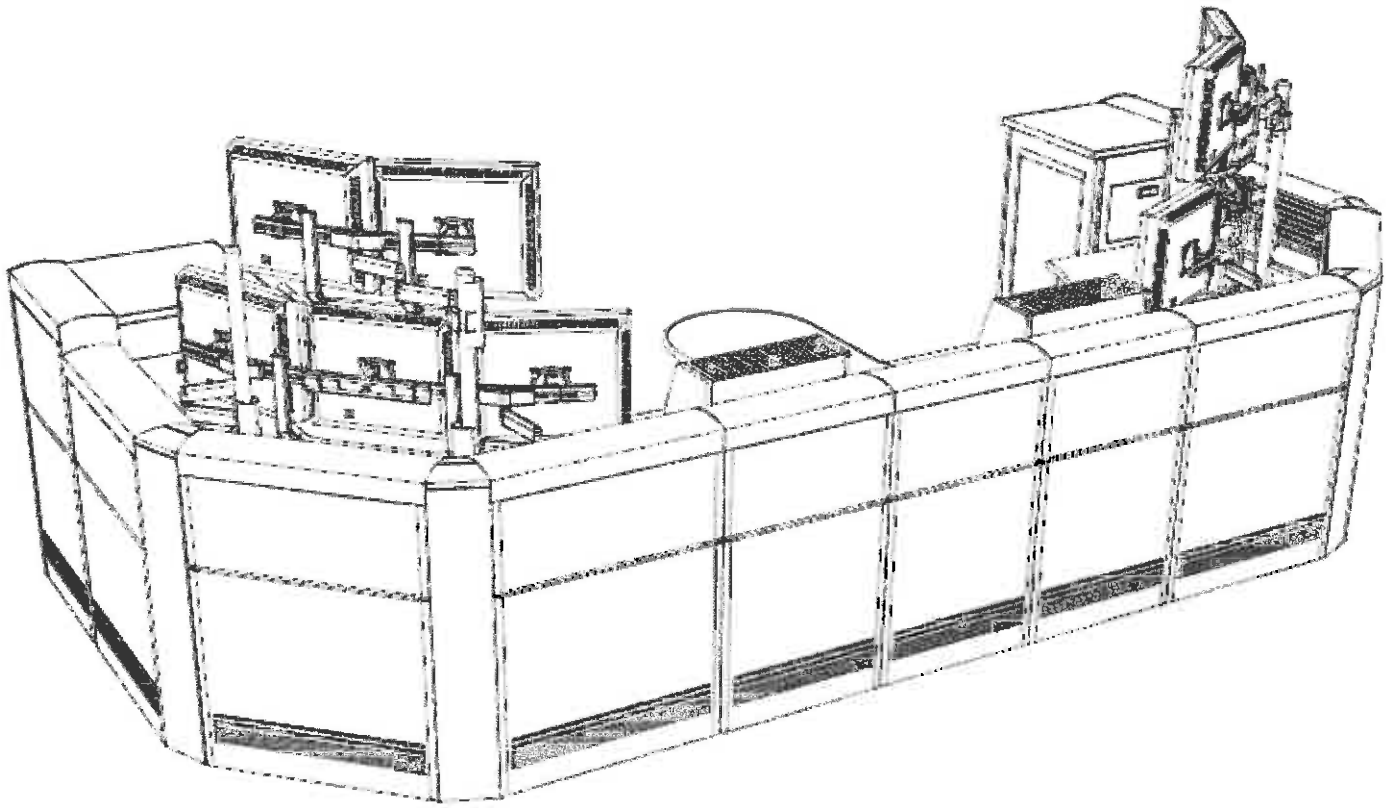
Workstation/Console Layout

Reference 1

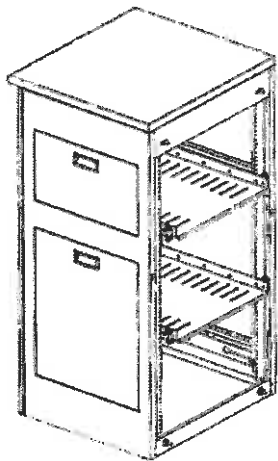
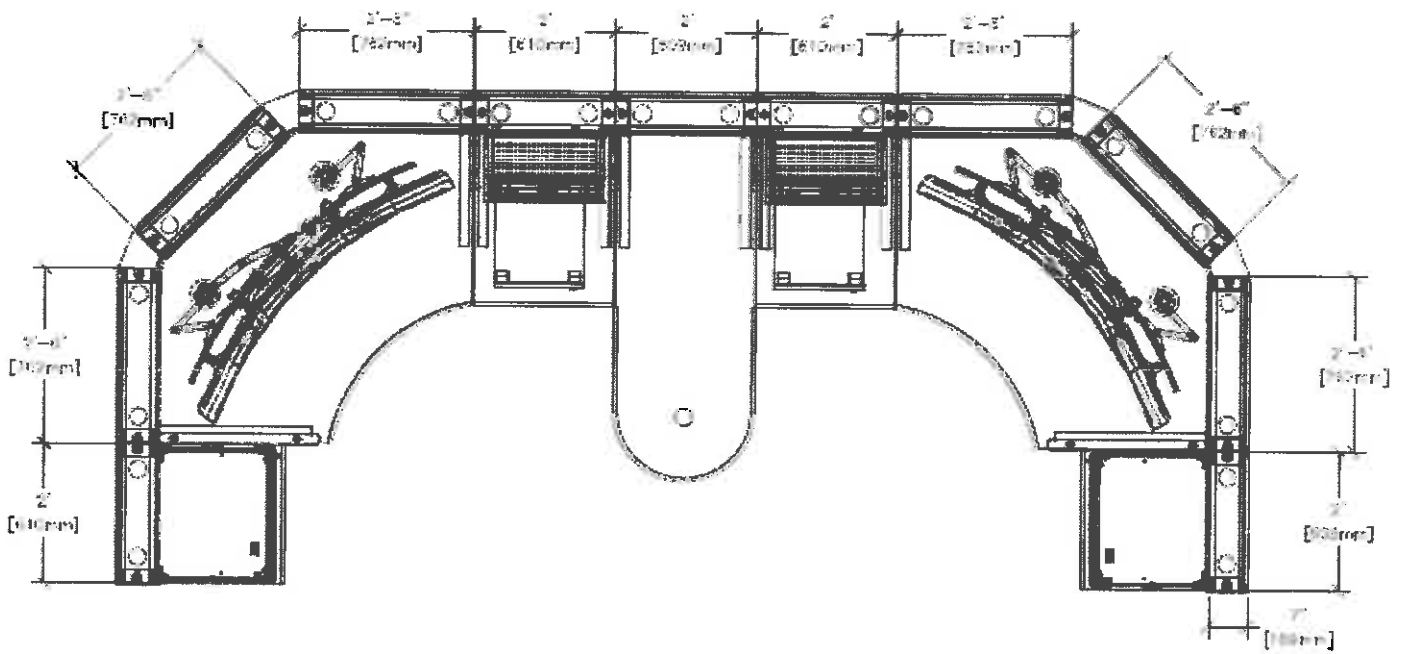


Reference 2:

11/23/2015



Reference 3:



Bill of Materials:

Quantity	Description	Part #
	Console package	
5	24" Core, Single Sided	PC2429S1
6	30" Core, Single Sided	PC3029S1
1	24x12 Display Wall Ss	PDW2412S
2	24x16 Modular Wall Ss	PMW2416S
2	24x12 Modular Wall Ss	PMW2412S
6	30x12 Display Wall Ss	PDW3012S
5	24" Wide Wall Top Trim, Ss	PDWT24S1
6	30" Wide Wall Top Trim, Ss	PDWT30S1
2	30-30-30 Stationary Curved Corner	PCC303030
2	24x30 Linear Work surface	PWS24301
1	24x60 Peninsula Work surface (30/30)	PPWS24601
6	26" Wide Core Skin	PCSK2600
3	20" Wide Core Skin	PCSK2000
2	R/M Module Insert	PRMM24126U
1	Rack mount Tower, T1-16	PTWRR24201RM
1	Rack mount Tower, T1-16	PTWRL24201RM
4	Standard Duty Fixed Shelf, 19" Eia, 1U, 20"/508Mm D, 200 Lbs/91 K, Steel; Black	EAFS19201U20
1	30"D Full Depth Upright Lh	PUPRFLH1
1	30"D Full Depth Upright Rh	PUPRFRH1
4	30"D Transition Upright	PUPRTRN1
2	Vertical End Trim T1 (16)	PVET16T1
2	Transition Vertical End Trim T1 (12 to 16)	PVEWT000
4	Grommet Mount For Pole, Black	TOACTA1000B
4	36" Extension Pole, Black	TOACTA1036B
6	Pole Mount, Articulating Dual Swing Arm and 42" Monitor Array	TOACGMA320B
4	Fpd Array Handle, Steel: Black	ARRAYHANDLE
6	Ba, 120V, 15A, (8) 5-15, 5-15P, 15' Cord, 24"L	PDTO115815B2
5	Ba, 120V, 15A, (8) 5-15, 5-15P, 15' Cord, 17"L	PDTO115815A2
2	Box/Box/File Mobile Pedestal	C845
1	30" Rotating Resource W/work surface	PRR30WS
	CCTV/workstations/integration/service plans	
4	Ubiquity Wireless transceiver Kit	UNB-5GHZ
6	Rialto A4 analog analytic appliance. 4 channel analog camera encoder with either 40GB solid state or 500GB hard drive storage. Supports up to 4 x D1 resolution cameras at 30 fps.	VAA-A4-H500G
8	8 Camera channel device license	DV-CH-8UP
1	Digital video integration view license	SWG-DV
14	FCWnx Level 1 SSA per Additional single client license	WXL1SSASWOPT-001CLNT
1	FCWnx Level 1 SSA Reader capacity license; 512readers per server (Enterprise & Global Only)	WXL1SSARDRLIC0512CAP
1	FCWnx Level 1 SSA API Connectivity; add-on option per instance	WXL1SSAOPT-001APIC
1	FCWnx Level 1 SSA - Enterprise single server system; base software licensed up to (1) remote clients; (16) reader (16) camera capacity. Additional software options and capacity licenses apply separately.	WXL1SSA-ENTSERV

1	Lenel Facility Commander Wnx Integration Module for a site. Enables bi-directional event integration between Facility Commander Wnx and an Avigilon Control Center site.	ACC5-LENL-FCWNX
2	ACC 5 Enterprise license for up to 24 camera channels and unlimited viewing clients	24C-ACC5-ENT
3	ACC 5 Enterprise license for up to 8 camera channels and unlimited viewing clients	8C-ACC5-ENT
3	HD NVR, 21.0 TB Storage, 2U Rack Mount	21.0TB-HD-NVR2
3	Cisco Gigabit 802.3af Class 3 PoE, 24 Port	S24 Switch
2	Professional USB Surveillance joystick for full control of Avigilon Control Center including shuttle playback control and digital and conventional PTZ.	ACC-USB-JOY-PRO
50	4-Port H.264 Analog Video Encoder with 4 audio support	4 ENC-4P-H264
16	Mounting bracket for 3 Analog Video Encoders in 1U of standard rack space	4 ENC-4P-H264
8	OmniMount 23-in to 42-in Metal Wall TV Mount	OC100T
8	40" Commercial Grade Monitor, 1-HDMI- rated at 50,000	SMT-4031
2	Video wall work stations mounts	STG- WM 4U
8	HDMI 50 foot commercial grade cable	1- lot
1	Interconnections (Wire and Coax jumpers, Media port/DVI to HDMI converters)	1-lot
6	USB Extenders for work stations	1-lot
3	Video wall work stations - EVGA Geforce GTX 970, 1 TB Drive, 1000W PS, AS ROCK MB Intel I7 - six core 3.3 GHz, 16 Gig DDR Ram	ESC-CUS-VWPC-I733
2	Dell 24 inch HD monitors Pro series, 8ms, antiglare, ED-backlit LCD monitor - 23.8" HDMI, DisplayPort, Mini DisplayPort	U2414H
1	57" HD 1080P Collaboration workstation - monitor/PC "all in one" with SIP service for 1 year, Collaboration workstation extended warranty, HDMI to ONVIF/RTSP converter, speaker kit, 1080P camera, Wireless keyboard, Wireless mouse, touch screen, integrated windows 7 pc with MS office business edition, video conference package (Polycom, Cisco) remote phone collaboration app, annotation/whiteboard	ESC-FO-57PGK
3	16 channel Pelco Coaxitron Translator	CM9760-CXTA

Pricing Page

Cost to provide a complete system: \$249,828.00

ELECTRONIC
SPECIALTY
COMPANY

Reference Sheet

Company Confidential - 11/23/15

Company Name: Putnam County Courthouse

Contact: Nyle Whittenton

Phone(304) 437-1782

Email: nwhittington@putnamwv.org

Date Work Completed: 3/14/2015

Company Name: Monongalia County Sheriff Department

Contact: Jeff Welch

Phone: (304) 291-7260

Email: jwelsh@monsheriff.com

Date Work Completed: 2/14/2014

Company Name: University of Charleston

Contact: Nikki Hughes

Phone: 304-357-4922

Email: nicolehughes@ucwv.edu

Date Work Completed: 10/15/2015

Confidential – do not publish

Certifications and Integrator Requirements:

Certification:

Security Systems Integrator will provide as an attachment to the bid package proof of factory certification for employee(s) for the following systems.

Failure to provide all required certifications will disqualify bidder.

- UTC - Facility Commander Wnx
- UTC - Lenel Onguard
- Avigilon - ACC VMS
- Cisco – (CCNA) Cisco Certified Network Associate Routing & Switching Certification



Cisco Career Certifications

Shannon White

HAS SUCCESSFULLY COMPLETED THE CISCO CAREER CERTIFICATION REQUIREMENTS AND IS RECOGNIZED AS A

Cisco Certified Network Associate — CCNA

Confidential – do not publish

Validate this certifier's authority at
www.cisco.com/go/verifycerts
Certificate Verification ID: **392104588700CQA11**

John Chambers
Chairman and CEO
Cisco Systems, Inc.

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CCNA11
11



A UTC Fire & Security Company

HAVING MET THE REQUIREMENTS

Aaron Davis

of

Electronic Specialty Company

IS NOW CERTIFIED

FOR

ACCESS CONTROL HARDWARE

Lenel OnGuard 2010 Technology Update (6.4)

January 10, 2011

Certified by

Lenel Systems International, Inc.





Ed Dye

Has successfully completed the Lenel Certification Program requirements and is recognized as a

Lenel Certified Associate



Jon Ferguson
Lenel Certification Program Chair
Lenel Systems International, Inc.

Mike Navaroli
Vice President, Global Services
Lenel Systems International, Inc.

Certificate of Completion



**OnGuard Hardware &
Software Fundamentals**
April 17, 2015

OnGuard 7.0 Enterprise
7.0.932



Kurt Brooks
Director, Global Education
Lenel Systems International, Inc.

Liz Hoath
Product Training Specialist
Lenel Systems International, Inc.

GE
Security

This is to Certify that

Aaron Davis

Electronic Specialty Company

has successfully completed the

Facility Commander Wnx Certification Course

a factory training program for

installation and configuration of Facility Commander Wnx

and is hereby awarded factory certification.

11/27/2007 24 Hours

Certification Number: 110005215

A large, stylized handwritten signature in black ink, appearing to read 'L. Hengstbeck', written over a horizontal line.

Instructor

Chris Hengstbeck
Training Leader



A UTC Fire & Security Company

HAVING MET THE REQUIREMENTS

Aaron Davis

of

Electronic Specialty Company

IS NOW CERTIFIED

FOR

DIGITAL VIDEO

Lenel OnGuard 2010 Technology Update (6.4.500 TU1)

December 23, 2011

Certified by

Lenel Systems International, Inc.



Avigilon University Certified Field Technician

Electronic Specialty Co.

Aaron Davis

**AVIGILON
UNIVERSITY**



AVIGILON
THE RESIDENT™

April 22, 2011

A handwritten signature in black ink.

Amir Javidan Director of Technical Services

Security

This is to Certify that

Albert Azevedo

Electronic Specialty Company

has successfully completed the

Facility Commander Wnx Certification Course

a factory training program for

installation and configuration of Facility Commander Wnx

and is hereby awarded factory certification.

6/19/2007 24 Hours

Certification Number: 110003157



B. Anderson
Instructor

[Signature]
Training Leader

CONTRACTOR LICENSE

Authorized by the

West Virginia Contractor Licensing Board

Number: WV010229

Classification:

ELECTRICAL
SPECIALTY

ELECTRONIC SPECIALTY COMPANY
DBA ELECTRONIC SPECIALTY COMPANY
PO BOX 400
DUNBAR, WV 25064-0400

Date Issued

Expiration Date

SEPTEMBER 25, 2015

SEPTEMBER 25, 2016



Authorized Company Signature



Chair, West Virginia Contractor
Licensing Board



**WEST VIRGINIA
CONTRACTOR
LICENSING
BOARD**

This license, or a copy thereof, must be posted in a conspicuous place at every construction site where work is being performed. This license number must appear in all advertisements, on all bid submissions and on all fully executed and binding contracts. This license cannot be assigned or transferred by licensee. Issued under provisions of West Virginia Code, Chapter 21, Article 11.



**State of West Virginia
DRUG FREE WORKPLACE CONFORMANCE AFFIDAVIT
West Virginia Code §21-1D-5**

STATE OF WEST VIRGINIA,

COUNTY OF Kanawha **, TO-WIT:**

I, William K Miller, after being first duly sworn, depose and state as follows:

1. I am an employee of Electronic Specialty Company; and,
(Company Name)
2. I do hereby attest that Electronic Specialty Company
(Company Name)

maintains a written plan for a drug-free workplace policy and that such plan and policy are in compliance with **West Virginia Code §21-1D**.

The above statements are sworn to under the penalty of perjury.

Printed Name: William K. Miller

Signature: William K Miller

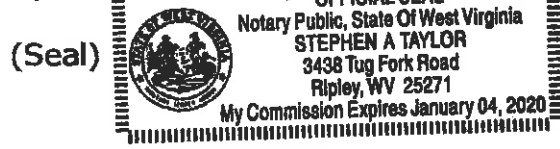
Title: Vice President

Company Name: Electronic Specialty Company

Date: 11/24/15

Taken, subscribed and sworn to before me this 24th day of November, 2015.

By Commission expires 1/4/2020



[Signature]
(Notary Public)

THIS AFFIDAVIT MUST BE SUBMITTED WITH THE BID IN ORDER TO COMPLY WITH WV CODE PROVISIONS. FAILURE TO INCLUDE THE AFFIDAVIT WITH THE BID SHALL RESULT IN DISQUALIFICATION OF THE BID.

BID BOND

KNOW ALL MEN BY THESE PRESENTS, That we, the undersigned, Electronic Specialty Company
of Dunbar, WV, as Principal, and Merchants Bonding Company (Mutual)
of Des Moines, IA, a corporation organized and existing under the laws of the State of
IA with its principal office in the City of Des Moines, as Surety, are held and firmly bound unto the State
of West Virginia, as Oblgee, in the penal sum of Five Percent of Amount Bid (\$ 5%) for the payment of which,
well and truly to be made, we jointly and severally bind ourselves, our heirs, administrators, executors, successors and assigns.

The Condition of the above obligation is such that whereas the Principal has submitted to the Purchasing Section of the
Department of Administration a certain bid or proposal, attached hereto and made a part hereof, to enter into a contract in writing for
Command Center Upgrade Solicitation No. CRFQ 0622 PRS1600000001 - According to Plans and Specifications

NOW THEREFORE,

- (a) If said bid shall be rejected, or
- (b) If said bid shall be accepted and the Principal shall enter into a contract in accordance with the bid or proposal
attached hereto and shall furnish any other bonds and insurance required by the bid or proposal, and shall in all other respects perform
the agreement created by the acceptance of said bid, then this obligation shall be null and void, otherwise this obligation shall remain in
full force and effect. It is expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no
event, exceed the penal amount of this obligation as herein stated.

The Surety, for the value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no
way impaired or affected by any extension of the time within which the Oblgee may accept such bid, and said Surety does hereby
waive notice of any such extension.

WITNESS, the following signatures and seals of Principal and Surety, executed and sealed by a proper officer of Principal and
Surety, or by Principal individually if Principal is an individual, this 24th day of November, 2015.

Principal Seal

Electronic Specialty Company
(Name of Principal)
By: [Signature] (Owens Hibbin II)
(Must be President, Vice President, or
Duly Authorized Agent)
VICE PRESIDENT
(Title)

Surety Seal

Merchants Bonding Company (Mutual)
(Name of Surety)
By: [Signature]
Kimberly J. Wilkinson, WV Resident Agent Attorney-in-Fact

**IMPORTANT - Surety executing bonds must be licensed in West Virginia to transact surety insurance, must affix its seal, and
must attach a power of attorney with its seal affixed.**

MERCHANTS
BONDING COMPANY™
POWER OF ATTORNEY

Know All Persons By These Presents, that MERCHANTS BONDING COMPANY (MUTUAL) and MERCHANTS NATIONAL BONDING, INC., both being corporations of the State of Iowa (herein collectively called the "Companies") do hereby make, constitute and appoint, individually,

Allan L McVey; Gregory T Gordon; Kimberly J Wilkinson; Patricia A Moye

their true and lawful Attorney(s)-in-Fact, to make, execute, seal and deliver on behalf of the Companies, as Surety, bonds, undertakings and other written obligations in the nature thereof, subject to the limitation that any such instrument shall not exceed the amount of:

EIGHT MILLION (\$8,000,000.00) DOLLARS

This Power-of-Attorney is granted and is signed and sealed by facsimile under and by authority of the following By-Laws adopted by the Board of Directors of Merchants Bonding Company (Mutual) on April 23, 2011 and adopted by the Board of Directors of Merchants National Bonding, Inc., on October 24, 2011.

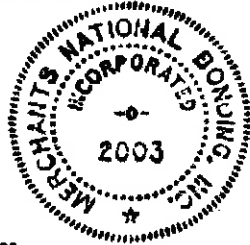
"The President, Secretary, Treasurer, or any Assistant Treasurer or any Assistant Secretary or any Vice President shall have power and authority to appoint Attorneys-in-Fact, and to authorize them to execute on behalf of the Company, and attach the seal of the Company thereto, bonds and undertakings, recognizances, contracts of indemnity and other writings obligatory in the nature thereof."

"The signature of any authorized officer and the seal of the Company may be affixed by facsimile or electronic transmission to any Power of Attorney or Certification thereof authorizing the execution and delivery of any bond, undertaking, recognizance, or other suretyship obligations of the Company, and such signature and seal when so used shall have the same force and effect as though manually fixed."

In connection with obligations in favor of the Florida Department of Transportation only, it is agreed that the power and authority hereby given to the Attorney-in-Fact includes any and all consents for the release of retained percentages and/or final estimates on engineering and construction contracts required by the State of Florida Department of Transportation. It is fully understood that consenting to the State of Florida Department of Transportation making payment of the final estimate to the Contractor and/or its assignee, shall not relieve this surety company of any of its obligations under its bond.

In connection with obligations in favor of the Kentucky Department of Highways only, it is agreed that the power and authority hereby given to the Attorney-in-Fact cannot be modified or revoked unless prior written personal notice of such intent has been given to the Commissioner-Department of Highways of the Commonwealth of Kentucky at least thirty (30) days prior to the modification or revocation.

In Witness Whereof, the Companies have caused this instrument to be signed and sealed this 15th day of August, 2015



MERCHANTS BONDING COMPANY (MUTUAL)
MERCHANTS NATIONAL BONDING, INC.

By *Larry Taylor*

President

STATE OF IOWA
COUNTY OF Dallas ss.

On this 15th day of August, 2015, before me appeared Larry Taylor, to me personally known, who being by me sworn did say that he is President of the MERCHANTS BONDING COMPANY (MUTUAL) and MERCHANTS NATIONAL BONDING, INC.; and that the seals affixed to the foregoing instrument are the Corporate seals of the Companies; and that the said instrument was signed and sealed in behalf of the Companies by authority of their respective Boards of Directors.



Wendy Woody
Notary Public, Polk County, Iowa

(Expiration of notary's commission does not invalidate this instrument)

I, William Warner, Jr., Secretary of the MERCHANTS BONDING COMPANY (MUTUAL) and MERCHANTS NATIONAL BONDING, INC., do hereby certify that the above and foregoing is a true and correct copy of the POWER-OF-ATTORNEY executed by said Companies, which is still in full force and effect and has not been amended or revoked.

In Witness Whereof, I have hereunto set my hand and affixed the seal of the Companies on this 24th day of November, 2015



William Warner Jr.
Secretary

State of West Virginia
VENDOR PREFERENCE CERTIFICATE

Certification and application is hereby made for Preference in accordance with **West Virginia Code**, §5A-3-37. (Does not apply to construction contracts). **West Virginia Code**, §5A-3-37, provides an opportunity for qualifying vendors to request (at the time of bid) preference for their residency status. Such preference is an evaluation method only and will be applied only to the cost bid in accordance with the **West Virginia Code**. This certificate for application is to be used to request such preference. The Purchasing Division will make the determination of the Vendor Preference, if applicable.

1. **Application is made for 2.5% vendor preference for the reason checked:**
 Bidder is an individual resident vendor and has resided continuously in West Virginia for four (4) years immediately preceding the date of this certification; **or**,
 Bidder is a partnership, association or corporation resident vendor and has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; or 80% of the ownership interest of Bidder is held by another individual, partnership, association or corporation resident vendor who has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; **or**,
 Bidder is a nonresident vendor which has an affiliate or subsidiary which employs a minimum of one hundred state residents and which has maintained its headquarters or principal place of business within West Virginia continuously for the four (4) years immediately preceding the date of this certification; **or**,
2. **Application is made for 2.5% vendor preference for the reason checked:**
 Bidder is a resident vendor who certifies that, during the life of the contract, on average at least 75% of the employees working on the project being bid are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; **or**,
3. **Application is made for 2.5% vendor preference for the reason checked:**
 Bidder is a nonresident vendor employing a minimum of one hundred state residents or is a nonresident vendor with an affiliate or subsidiary which maintains its headquarters or principal place of business within West Virginia employing a minimum of one hundred state residents who certifies that, during the life of the contract, on average at least 75% of the employees or Bidder's affiliate's or subsidiary's employees are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; **or**,
4. **Application is made for 5% vendor preference for the reason checked:**
 Bidder meets either the requirement of both subdivisions (1) and (2) or subdivision (1) and (3) as stated above; **or**,
5. **Application is made for 3.5% vendor preference who is a veteran for the reason checked:**
 Bidder is an individual resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard and has resided in West Virginia continuously for the four years immediately preceding the date on which the bid is submitted; **or**,
6. **Application is made for 3.5% vendor preference who is a veteran for the reason checked:**
 Bidder is a resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard, if, for purposes of producing or distributing the commodities or completing the project which is the subject of the vendor's bid and continuously over the entire term of the project, on average at least seventy-five percent of the vendor's employees are residents of West Virginia who have resided in the state continuously for the two immediately preceding years.
7. **Application is made for preference as a non-resident small, women- and minority-owned business, in accordance with West Virginia Code §5A-3-59 and West Virginia Code of State Rules.**
 Bidder has been or expects to be approved prior to contract award by the Purchasing Division as a certified small, women- and minority-owned business.

Bidder understands if the Secretary of Revenue determines that a Bidder receiving preference has failed to continue to meet the requirements for such preference, the Secretary may order the Director of Purchasing to: (a) reject the bid; or (b) assess a penalty against such Bidder in an amount not to exceed 5% of the bid amount and that such penalty will be paid to the contracting agency or deducted from any unpaid balance on the contract or purchase order.

By submission of this certificate, Bidder agrees to disclose any reasonably requested information to the Purchasing Division and authorizes the Department of Revenue to disclose to the Director of Purchasing appropriate information verifying that Bidder has paid the required business taxes, provided that such information does not contain the amounts of taxes paid nor any other information deemed by the Tax Commissioner to be confidential.

Under penalty of law for false swearing (West Virginia Code, §61-5-3), Bidder hereby certifies that this certificate is true and accurate in all respects; and that if a contract is issued to Bidder and if anything contained within this certificate changes during the term of the contract, Bidder will notify the Purchasing Division in writing immediately.

Bidder: Electronic Specialty Company

Signed: William K. Miller

Date: 11/23/2015

Title: VP

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

MANDATE: Under W. Va. Code §5A-3-10a, no contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and: (1) the debt owed is an amount greater than one thousand dollars in the aggregate; or (2) the debtor is in employer default.

EXCEPTION: The prohibition listed above does not apply where a vendor has contested any tax administered pursuant to chapter eleven of the W. Va. Code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

DEFINITIONS:

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Employer default" means having an outstanding balance or liability to the old fund or to the uninsured employers' fund or being in policy default, as defined in W. Va. Code § 23-2c-2, failure to maintain mandatory workers' compensation coverage, or failure to fully meet its obligations as a workers' compensation self-insured employer. An employer is not in employer default if it has entered into a repayment agreement with the Insurance Commissioner and remains in compliance with the obligations under the repayment agreement.

"Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceeds five percent of the total contract amount.

AFFIRMATION: By signing this form, the vendor's authorized signer affirms and acknowledges under penalty of law for false swearing (W. Va. Code §61-5-3) that neither vendor nor any related party owe a debt as defined above and that neither vendor nor any related party are in employer default as defined above, unless the debt or employer default is permitted under the exception above.

WITNESS THE FOLLOWING SIGNATURE:

Vendor's Name: Electronic Specialty Company

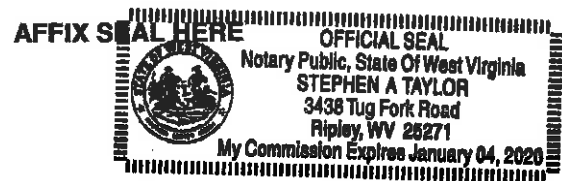
Authorized Signature: *William Kynette* Date: 11/23/2015

State of West Virginia

County of Kanawha, to-wit:

Taken, subscribed, and sworn to before me this 1/4 day of November, 2015.

My Commission expires 1/4, 2020



NOTARY PUBLIC *[Signature]*
Purchasing Affidavit (Revised 08/01/2015)