



Project Proposal

June 19, 2019

Mr. Ken Dado
Utility Operations Manager
Village of Orland Park
15655 S. Ravinia Avenue
Orland Park, IL 60462

Subject: SCADA Server Upgrades

Concentric Project Number: 190578.50

Dear Mr. Dado:

The Orland Park SCADA system has served the Village well for many years. However, just like automobiles, reliability typically decreases as SCADA systems age. Components wear out and maintenance costs (both in time and money) increase. Moreover, available technology improves with time and typically offers greater efficiencies that were not available at the time the original SCADA system was designed. Orland Park is experiencing both of these trends in the Village's SCADA system.

First, the existing SCADA server is over five years old and experiencing periodic hardware failures. As a result, Village staff have to periodically remove and reseal critical system components just to get the server operational again. This problem is urgent. To address it, Concentric proposes to replace the SCADA server with a virtualized server managed by Village IT staff.

At the same time as the server upgrade, Concentric proposes to upgrade the iFix SCADA software running on the server. The existing software is several versions out of date and it will save time and cost to upgrade this software as part of the server upgrade rather than doing it later.

Thirdly, there is a remote access server located at the Police Department which provides remote connectivity to SCADA. Concentric proposes to consolidate this server into the proposed SCADA server virtual infrastructure. This consolidation option is available due to advancements in virtualization technology and should result in reduced management effort for the servers.

Lastly, once the server architecture and software have been brought up to current standards, the Village will be able to pursue greater operational insights. In keeping with the Village's existing capital plans, Concentric proposes to install the planned SCADA Historian. Implementing the Historian as part of the SCADA server infrastructure improvements, Orland Park will realize some economies of scale, thus reducing the overall cost to the Village. The Historian provides the capability to efficiently collect and store enormous amounts of operational data from SCADA. By implementing the Historian, the Village will be establishing the foundation for further analytics of their operational data, which is likely to lead to operational efficiencies.

Project Approach



Concentric is proposing a refreshed design for the Village's SCADA architecture to facilitate the improvements mentioned above. Our proposed solution seeks to consolidate the Village SCADA architecture in a single virtual platform, enhance system resiliency, and improve network security and disaster recovery.

Consolidate Village SCADA Architecture

Consolidation of the SCADA Application Server, SCADA Remote Desktop Server, and (optional) SCADA Historian into a single Virtual host server should minimize the costs of hardware, software, licensing, and ongoing support. In the existing architecture, each SCADA server runs on its own dedicated hardware. With modern virtualization capabilities, the hardware footprint can be reduced by running all SCADA servers on a shared virtual infrastructure.

Enhance System Resiliency

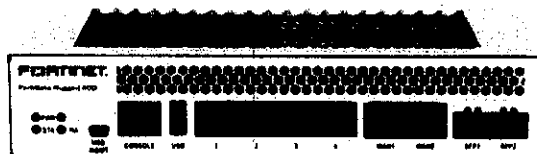
By virtualizing the SCADA servers, Orland Park will enable the option to eventually implement SCADA server replication. Effectively this means two identical virtual SCADA servers could run in parallel. If the primary SCADA server failed, the parallel server could immediately take over until the primary was restored, resulting in zero downtime. The actual implementation of this replication is not included in this project, but this project establishes the foundation for that replication.

Improve Network Security and Disaster Recovery

Several infrastructure recommendations contained in this proposal are intended to improve the Village's SCADA network security and disaster recovery. These recommendations are informed by the Department of Homeland Security's current best practices.

One of the primary recommendations is to replace the existing Cisco ASA5505 firewall that protects the SCADA network. The firewall is currently nearing the end of its life. Concentric is recommending replacing this device with the FortiGate 60D with the Industrial Security Service (ISS) used to protect ICS / SCADA protocols. The ISS module understands and protects SCADA-specific traffic and will help to block unwanted, non-SCADA traffic from interfering with the Village's SCADA network.

During the course of this project, Concentric will also further enhance the separation of the SCADA servers from the administrative network by leveraging the new Fortinet firewall. We will review and adjust the firewall rules to isolate the SCADA network as much as possible while still permitting necessary functionality and accessibility from the administrative network.





Another key recommendation to improve disaster recovery is to implement an automated SCADA backup architecture. While Village staff currently performs backups periodically, it is a better practice to automate these backups. Doing so allows for more frequent restore points and reduces the potential of data loss in the event of a disaster. The Village currently uses VEEAM for cloud-based backups of other key IT hardware. Concentric would work with Village staff to leverage VEEAM to also perform SCADA-related backups. The VEEAM configured SCADA backups would allow for rapid restoration in the event of an emergency.

Below is the specific scope of services recommended to carry out the aforementioned objectives.

Scope of Services

Equipment

Equipment Description

1. SCADA Software
 - a. One (1) iFix 6.0 Unlimited Developer SCADA Server License
 - b. Two (2) iFix 6.0 Thick Client Runtime Licenses
 - c. One (1) iFix Terminal Services Unlimited Developer w/ 5 client License
 - d. One (1) Upgrade to latest version of XLReporter
 - e. One (1) Upgrade of WIN-911 Intermediate to the latest version
 - f. One (1) Upgrade of existing IGS driver
 - g. GE Acceleration Plan included through April 20, 2020 for the above GE licenses
2. One (1) Hewlett Packard DL360 GEN10 (or equivalent) with the following:
 - a. Two (2) Intel® Xeon® XEON-Silver 4214 Processors
 - b. 64GB RAM
 - c. RAID1 + RAID 5, Two (2) 480GB SSD (boot), Five (5) 600GB 10K RPM SAS Hot-plug Hard Drives (data storage)
 - d. 12Gb/s SAS Controller
 - e. ILO Advanced
 - f. Dual, Hot Plug, Redundant Power Supply (1+1), 500W
 - g. 5YR 24X7 FOUNDATION CARE DL360 SVCS GEN10



3. Two (2) Dell Optiplex Dell OptiPlex 7000 7060 Desktop Computers (or equivalent)
 - a. Intel Core i7 (8th Gen) i7-8700 3.20 GHz
 - b. 16 GB DDR4 SDRAM
 - c. 256 GB SSD
 - d. Windows 10 Pro 64-bit (English/French/Spanish)
 - e. Mini-tower - DVD-Writer DVD±R/±RW
 - f. AMD Radeon RX 550 Graphics
 - g. 3 Year Next Business Day Warranty
4. Two (2) FortiGate Rugged 60D with Enterprise Protection Bundle (includes FortiGuard Industrial Security Service).
5. Two (2) One year FortiCare 24 hour, 7 days a week support service with 4-hour hardware replacement contract.
6. Two (2) FR-TRAN-LX single mode fiber transceivers for the FortiGate Rugged 60D
7. Two (2) Ubiquiti AF-24HD-US AirFiber, 24GHz, 2Gbps wireless backhaul radios

Labor

Project Management

1. Plan, schedule, and coordinate the activities that must be performed to complete the Project
2. Host kickoff meeting at Orland Park Public Works prior to start of work

SCADA Hardware Upgrade

1. Configure the Virtual Host server for the following virtual servers:
 - a. OPSC1 – SCADA Server
 - b. OPSCRDS1 – SCADA Remote Desktop Server
 - c. OPSCHIST1 – SCADA Historian
 - d. OPSCBI1 – Vantagepoint server
2. Configure new virtual SCADA Server (replacement SCADA Server) with iFIX 5.9 software application and WIN-911 Intermediate.
3. Configure new virtual Remote Desktop Server (replacement RDS Server) with iFIX 5.9 software.
4. Install one (1) Yeastar VoIP PBX to replace the existing dialogic card to enable alarm phone notification. The existing POTS line will be connected to the PBX and the WIN-911 software will communicate via a SIP call to place phone calls.



5. Install Microsoft Office on SCADA server and Remote Desktop Server.
6. Provide refreshed Visio-based network diagram at the conclusion of the project to the Village showing the resulting network architecture.
7. Replace existing thick client PC's with new Dell OptiPlex 7000 desktops.

SCADA Server Software Migration

1. Upgrade existing iFix application to iFix 5.9 (in a test environment) and then configure iFix 5.9 on three of the above virtual servers.
2. Provide licensing for iFix 6.0. We are installing version 5.9 because it has been proven stable, but the Village will own the licenses to version 6.0 if and when future upgrades are desired. When the time comes where version 6.0 has been proven stable, the cost to upgrade to it will be substantially lower because the Village already owns the proper licensing.
3. Develop into SCADA application indication and alarms notifying the connection status of both the fiber and Ubiquiti communication links between Public Works and the Main Pump Station.
4. Upgrade existing license of XLReporter to latest version. At the time of this writing, the latest version is 12. XLReporter will be installed on one of the thick client desktops.

Firewall Replacement

1. Program the Fortinet firewalls to provide the same level of access as the current Cisco 5505, migrating all firewall rules.
2. Review existing firewall configurations and revise firewall rules if necessary to meet best practices.
3. Activate Industrial Control Security Services to allow the firewall to identify and inspect SCADA-specific protocols.
4. Connect the two firewalls via the single mode fiber transceivers. Activate network monitoring for automatic failover between fiber network and wireless network paths.

(Optional) SCADA Historian and Business Intelligence (BI)

1. Provide, program, and configure Rockwell Historian SE and FactoryTalk Vantagepoint
 - a. 500 point Historian SE license



- b. Provide a three (3) named user Vantagepoint license to allow access to BI tools and trending. The three named users will be chosen by Orland Park at the kickoff meeting.
- c. Configure data model for historical information and trending.
 - a. Data model design will be a collaborative effort with Village staff. The data model design meeting will be scheduled at the kickoff meeting. Participants in the data model design meeting will be identified at the kickoff meeting as well.
 - b. Tags currently historized in iFix will be brought into the FactoryTalk Historian data model as part of this project. Prior data will be kept in iFix classic historian and will not be rolled into FactoryTalk Historian as part of this project.
- d. Provide two, 2-hour training classes onsite. One class is intended for basic user functions and use of the portal and historian tools. The other class is for "power users" to learn how to create/modify dashboards and trends.
- e. Dashboard creation capability will be established as part of this project. Dashboards themselves will not be created as part of this project, but could be created as part of future collaborations. With proper training, Village staff would also have the capability to create their own dashboards.

Concentric Assumptions / Owner Responsibilities

- 1. Owner will provide all required Microsoft Licensing for this project
- 2. Owner will provide all required Antivirus Licensing for this project
- 3. Owner will provide and configure centralized backup solution for new SCADA environment
- 4. Owner will provide server rack in Public Works to install new virtual SCADA server. KVM, if desired, is the responsibility of the Owner and is not included in this project. It is assumed that Owner has sufficient UPS capacity in the server rack provided.
- 5. Owner will provide network switch or utilize existing network hardware.
- 6. Owner will be installing and configuring the Ubiquiti airFiber wireless backhaul system (though the Ubiquiti devices are being provided by Concentric). In the event that programming or installation is needed, Concentric will work with the Owner to perform the work under a separate contract.
- 7. Concentric assumes based on assurances from Owner that clear line of site exists between Public Works and the Main Pump Station sites. If line of site is not clear, communication problems are likely to occur. Line of site communication problems, should they occur, are responsibility of Owner to rectify.



8. Owner will provide site access for installation, programming, and startup during Owner's normal business hours. Work outside of Owner's normal business hours can be agreed upon as needed, provided Concentric can secure the site(s) upon departure.
9. Owner understands that all existing equipment to remain is assumed to be in good, working order, except for existing SCADA server. In the event that any other equipment does not perform as-expected, Concentric will work with the Owner to repair, as-needed, under a separate contract.
10. Owner will dispose of/recycle any removed equipment.
11. Owner understands that warranty on materials will be provided strictly by the manufacturer. No additional labor or materials warranties are provided by Concentric.

Project Schedule

Our estimated project schedule will be agreed upon at the project kickoff meeting.

Warranty

The warranty listed in the attached Standard Terms & Conditions document (Paragraph 13):

- ☐ DOES apply
- ☒ DOES NOT apply

Fee

Our fee for the above scope is a lump sum of \$94,450 with an optional add-on of an additional lump sum of \$37,930, totaling \$132,380.

This agreement is valid for 90 days from the date of this proposal.

Terms & Conditions

Refer to attached Standard Terms & Conditions document.



Acceptance

If this proposal is acceptable, please select **ONLY ONE** option below, digitally a copy, and electronically return to us. Feel free to contact me if you have any questions.

#1 ☐	SCADA Server Upgrade Only	\$94,450
#2 ☐	SCADA Server Upgrade w/ SCADA Historian and Business Intelligence Solution	\$132,380

Sincerely,

CONCENTRIC INTEGRATION, LLC

Nicholas Paradiso, PE
Lead Automation Engineer
NAP

Christopher T. Sosnowski, PE
President
CTS

VILLAGE OF ORLAND PARK

ACCEPTED BY: _____

TITLE: _____

DATE: _____

Above signature implies acceptance of the attached **STANDARD TERMS & CONDITIONS**



Standard Terms & Conditions

1. The submitted proposal and these Standard Terms & Conditions constitute and are herein referred to as the Agreement.
2. Concentric Integration is herein referred to as Concentric, and the party with whom Concentric is entering into this Agreement with is herein referred to as Owner.
3. Concentric may submit requests for periodic progress payments for services rendered. Payments shall be due and owing by the Owner upon receipt of Concentric's invoice for services. Payments to Concentric after sixty (60) consecutive calendar days from the date of Concentric's invoice for services shall include an additional late payment charge computed Owner an annual rate of twelve percent (12%) from date of Concentric's invoice; and Concentric may, after giving seven (7) days written notice to the Owner, suspend services under this Agreement until Concentric has been paid in full all amounts due for services, expenses, and late payment charges.
4. This Agreement may be terminated, in whole or in part, by either party if the other party substantially fails to fulfill its obligations under this Agreement through no fault of the terminating party; or the Owner may terminate this Agreement, in whole or in part, for its convenience. However, no such termination may be effected unless the terminating party gives the other party: (1) not less than ten (10) calendar days written notice by certified mail of intent to terminate, and (2) an opportunity for a meeting with the terminating party before termination. If this Agreement is terminated by either party, Concentric shall be paid for services performed to the effective date of termination, including reimbursable expenses. In the event of contract termination, the Owner shall receive reproducible copies of Drawings, Custom Developed Applications and other documents completed by Concentric.
5. Concentric agrees to hold harmless and indemnify the Owner and each of its officers, agents and employees from any and all liability claims, losses, or damages, to the extent that such claims, losses, or damages are caused by Concentric's negligence in the performance of the services under this Agreement, but not including liability that may be due to the sole negligence of the Owner or other consultants, contractors or subcontractors working for the Owner, or their officers, agents and employees. In the event claims, losses, or damages are caused by the joint or concurrent negligence of Concentric and the Owner they shall be borne by each party in proportion to its negligence.
6. The Owner acknowledges that Concentric is a Limited Liability Company and not a Professional Service Corporation, and further acknowledges that the corporate entity, as the party to this contract, expressly avoids contracting for individual responsibility of its officers, directors, or employees.
7. The Owner and Concentric agree that any claim made by either party arising out of any act of the other party, or any officer, director, or employee of the other party in the execution or performance of the Agreement, shall be made solely against the other party and not individually or jointly against such officer, director, or employees.
8. For the duration of the project, Concentric shall procure and maintain insurance for protection from claims under worker's compensation acts, claims for damages because of bodily injury including personal injury, sickness or disease or death of any and all employees or of any person other than such employees, and from claims or damages because of injury to or destruction of property including loss of use resulting therefrom, alleged to arise from Concentric's negligence in the performance of services under this Agreement. The Owner shall be named as an additional insured on Concentric's general liability insurance policy. The limits of liability for the insurance required by this Subsection are as follows:

Workers Compensation: Statutory Limits General Liability: \$1,000,000 per claim / \$2,000,000 aggregate Automobile Liability: \$1,000,000 combined single limit	Excess Umbrella Liability: \$5,000,000 per claim and aggregate Professional Liability: \$5,000,000 per claim \$5,000,000 aggregate
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9. Notwithstanding any other provision of this Agreement, and to the fullest extent permitted by law, the total liability, in the aggregate, of Concentric and their officers, directors, employees, agents, and any of them, to the Owner and anyone claiming by, through or under the Owner, for any and all claims, losses, costs or damages whatsoever arising out of, resulting from or in any way related to the project or the Agreement from any cause or causes, including but not limited to the negligence, professional errors or omissions, strict liability or breach of contract or warranty expressed or implied of Concentric or their officers, directors, employees, agents or any of them, hereafter referred to as the "Owner's Claims", shall not exceed the total insurance proceeds available to pay on behalf of or to Concentric by their insurers in settlement or satisfaction of Owner's Claims under the terms and conditions of Concentric's insurance policies applicable thereto, including all covered payments made by those insurers for fees, costs and expenses of investigation, claims adjustment, defense and appeal.
10. Concentric is responsible for the quality, technical accuracy, timely completion, and coordination of all Designs, Drawings, Custom Developed Applications and other services furnished or required under this Agreement, and shall endeavor to perform such services with the same skill and judgment which can be reasonably expected from similarly situated professionals.
11. The Owner may, at any time, by written order, make changes within the general scope of this Agreement in the services to be performed by Concentric. If such changes cause an increase or decrease in Concentric's fee or time required for performance of any services under this Agreement, whether or not changed by any order, an equitable adjustment shall be made and this agreement shall be modified in writing accordingly. No service for which an additional compensation will be charged by Concentric shall be furnished without the written authorization of the Owner.
12. All Drawings, Custom Developed Applications, and other documents prepared or furnished by Concentric pursuant to this Agreement are instruments of service in respect to the project, and Concentric shall retain the right of reuse of said documents and electronic media by and at the discretion of Concentric whether or not the project is completed. Electronic copies of Concentric's documents for information and reference in connection with the use and occupancy of the project by the Owner and others shall be delivered to and become the property of the Owner; however, Concentric's documents are not intended or represented to be suitable for reuse by the Owner or others on additions or extensions of the project, or on any other project. Any such reuse without verification or adaptation by Concentric for the specific purpose intended will be at the Owner's sole risk and without liability or legal exposure to Concentric, and the Owner shall indemnify and hold harmless Concentric from all claims, damages, losses and expenses including attorneys' fees arising out of or resulting therefrom.
13. Concentric warrants that the services provided for under this Agreement will be completed in a good and workmanlike manner in accordance with applicable codes, ordinances, regulations or other legal Owner. For a period of one (1) year after the Owner receives beneficial use of the installation, Concentric will provide a limited warranty to the Owner for any defect due to improper materials or workmanship supplied by Concentric. Any such warranty provided to Owner shall be provided by Concentric without expense to the Owner for the one (1) year period described herein. **CONCENTRIC'S WARRANTY IS A LIMITED WARRANTY FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF BENEFICIAL USE OF THE INSTALLATION.** This warranty is limited to only defects in material and workmanship on products purchased and fully installed by Concentric and excludes defects caused by improper use, abuse, accident, acts-of-God (including but not limited to lightning), alteration, or other conditions beyond Concentric's control, as determined by Concentric, and all manufacturer's products or workmanship as covered by their respective warranties. For manufacturer's products or workmanship, Concentric will deliver to Owner all manufacturers' warranties of products. **IN CONSIDERATION OF THE LIMITED WARRANTY CONTAINED HEREIN THE OWNER AGREES AND ACKNOWLEDGES THAT SUCH WARRANTY REPLACES ALL OTHER WARRANTIES EITHER EXPRESS OR IMPLIED INCLUDING BUT NOT LIMITED TO ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.** Concentric's warranty is limited to repair or replacement of a defective product without cost to the Owner. **OWNER WAIVES ALL CLAIMS TO INCIDENTAL OR CONSEQUENTIAL DAMAGES.** This limited warranty extends only to the Owner and not to subsequent buyers/owners. Owner must give written notice of a defect within the one (1) year warranty period described above. In the event of any dispute between the Owner and Concentric, such dispute shall be resolved in accordance with these Standard Terms & Conditions and the Agreement.
14. Any provision or part thereof of this Agreement held to be void or unenforceable under any law shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon the parties. The parties agree that this Agreement shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision which comes as close as possible to expressing the intention of the stricken provision.
15. This Agreement contains and embodies the entire and integrated agreement between parties hereto and supersedes all prior negotiations, representations, or agreements, either written or oral.