CADENZA

Department of Technology
City of Columbus
Columbus, Ohio

8/30/18

Greetings,

As a leading network consulting firm headquartered in Columbus, Ohio we are pleased to submit our proposal for the upcoming Data Center Network Refresh. We understand the City of Columbus faces a wide range of technology workstreams including the Smart Cities initiative, the Internet of things, and balancing rapid growth while maintaining security.

Our proposal is based on a solid, forward looking, portfolio of network products from Juniper Networks. As other cities in central Ohio have already found, Juniper Networks provides the stability, security, and cost efficiency required to fuel the next wave to technological growth for our city. We're excited to demonstrate how our solution will:

- Provide a simple, reliable, high capacity network fabric to run the next generation of city applications.
- Integrate directly with the City's VMware NSX platform for both data center and security enhancements.
- Allow the network to continue to grow with minimal downtime for expansions and upgrades.
- Provide a team of networking subject matter experts local to Columbus to guide the City through each phase of implementation.

We look forward to learning how the next wave to technological innovation will improve the lives of Columbus residents.

Cadenza LLC (EIN 26-4637349), is headquartered at 7965 North High Street, Suite 160, Columbus, Ohio 43235. Jeremy O'Dette, Managing Partner, Cadenza LLC prepared this proposal with technical peer review from Brandon BeCraft, Network Architect, Cadenza LLC.

Inquiries related to this proposal should be directed to:

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Managing Partner
Cadenza LLC
614-940-3072
jeremy.odette@cadenzallc.com

Managing Partner

Jeremy O'Dette

Jeremy O'Dette, Managing Partner

8/30/18

Date

CITY OF COLUMBUS, OHIO

DEPARTMENT OF TECHNOLOGY

THE CITY OF COLUMBUS
ANDREW J. GINTHER, MAYOR

DEPARTMENT OF TECHNOLOGY

Request for Proposal

For

Hardware, Software, and Implementation Services

For

DATA CENTER NETWORK REFRESH

RFQ010007

Submittal Date: August 31, 2018 @ 11:00 a.m.

Andrew J. Ginther, Mayor

H. Samuel Orth III, Director of Technology

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1.0 INTRODUCTION

1.1 **Scope**:

The City of Columbus, Department of Technology (here after referred to as the City) is soliciting Proposals (here after referred to as RFP) pursuant to Columbus City Codes from experienced professional firms to assist with the purchase of a new Datacenter Network solution including hardware, software, licenses and implementation services necessary to replace the City's Core Data center equipment and implement technologies to adopt a software defined networking (SDN) platform.

The City owns and maintains two data centers classified as DC West and DC East. The City owns a private-fiber network which includes dual 10Gbps Ethernet connections between its two data centers over separate (dual entrance) circuit paths. The CORE of the network consists of two Cisco Catalyst 6500 series switches that serves as the termination point to connect various City Agencies and locations. The City is publishing this RFP with the intention to enter into multiple contracts with experienced offerors who will (as a whole) provide a complete solution to upgrade the existing network infrastructure in the City's primary and secondary datacenters.

The City is also modernizing its data center and will be adding a new underlay network to meet the City's software defined datacenter goals. The City will be expanding on its existing virtualization platform using VMware technologies and intends to implement a new VMware based overlay network as the standard for Software defined networking.

The City is looking to add a secondary internet presence at its second data center. As part of this proposal, a refresh to the City's Core Firewall and internet web filtering solution is required to implement a secondary active internet connection.

The City seeks to have full implementation and migration completed within 6-8 months of award and receipt of fully executed contracts as well as purchase order(s) confirmed by the Columbus City Auditor's Office with offeror(s) who will provide hardware, software, licenses, implementation and support services, and to train City personnel in its best use, in order to keep the system fully functional throughout its expected life span of at least five years.

This document serves as a guide for use by potential offerors as to the format and requirements of a successful proposal.

1.2 **Classification:** The contract resulting from this RFP will provide for the purchase and delivery of the solution as described in this RFP Requirements (Section 3.0). All offerors must document the manufacture certified reseller

partnership. Offerors are required to show experience in providing this type of technology from a hardware, software, implementation, maintenance, and warranty service as detailed in this RFP Offeror Requirements (Section 3.2)

1.2.1 **Site Visit:** A site visit will take place on **Wednesday, August 15, 2018** 10:00 a.m. local time at 1601 Arlingate Lane, Columbus Ohio 43228 and at 1:00 p.m. local time at 1111 E. Broad St, Columbus Ohio 43205. Attendance is not mandatory, however it is highly recommended as this will be the only opportunity to view the facilities prior to RFP opening. During the site visit, City officials will be escorting interested offerors to its data centers. It is expected that the visit to each site will last approximately 2 hours. No questions will be accepted at this visit, rather offerors are to submit questions as directed in (Section 2.1).

1.3 For additional information concerning this RFP including procedures on how to submit a proposal, you must go to the City of Columbus Vendor Services web site at: https://columbus.bonfirehub.com/opportunities/9907/.

2.0 RFP INSTRUCTIONS

Offerors are encouraged to submit proposals that describe products and services that will fulfill the purpose of this RFP as well as demonstrate their competency, ability, past performance, quality and feasibility, and environmental impact as defined in this request. Because offerors may choose to include only a subset of the desired functionality in their proposals, the City may select a single offeror or may choose to combine the proposals of multiple offerors. The City may also choose to acquire only a portion of what is proposed.

Selection of professional services shall be in accordance with sections 329 of Columbus City Codes, 1959. Any agreement or contract entered into will be in accordance with the provisions of Chapter 329, of Columbus City Codes, 1959, standard agreements rules and regulations. All offerors, and their proposed subcontractors, shall have valid City Contract Compliance Numbers (CCCN). Applications for certification may be obtained through the electronic vendor portal at http://vendors.columbus.gov/sites/public or from City of Columbus, Office of Diversity and Inclusion, 1111 East Broad St. 2nd Floor, Columbus, Ohio 43205 or by calling (614) 645-4764.

2.1 RFP Questions and Clarifications

Specific questions concerning the RFP requirements should be submitted in writing before August 17, 2018 @ 1100AM. Written questions must be submitted via the offeror portal at: https://columbus.bonfirehub.com/opportunities/9907/. Written responses will be prepared by the City and published at the link noted above. Responses will be published on the vendor portal no later than August 17,

2018 @ 1100AM. This will ensure accurate, consistent responses are provided to all potential offerors.

During the RFP and evaluation process, Offerors are strictly prohibited from communicating with any City employees or officers regarding this solicitation except through the method stated immediately above during the Question & Answer Period. Any communication from the offeror to the City after the Question & Answer period should be limited to only what is necessary. Necessary communication required by the City will be communicated clearly to Offerors. If any Offeror has a need to communicate with the City, the communication should be sent to: https://columbus.bonfirehub.com/opportunities/9907/. If a City employee attempts to communicate with an Offeror contrary to this provision, the Offeror shall report said incident to the http://vendors.columbus.gov/sites/public. A violation of this section on the part of the Offeror will lead to disqualification.

2.2 RFP Response Format

Offerors must address all information specified by this RFP (Section 3.0). All questions in Appendix C must be answered completely. The City reserves the right to verify any information contained in the offeror's RFP response, and to request additional information after the RFP response has been received.

Marketing brochures included as part of the main body of the RFP response will not be considered. Such material must be submitted only as attachments and must not be used as a substitute for written responses. In case of any conflict between the content in the attachments and an offeror's answers in the body of the proposal, the body of the proposal will prevail.

2.2.1 Cover Letter

The proposal must be accompanied by a cover letter, signed by an individual authorized to bind the proposed entity.

The cover letter should include:

- A brief executive summary of the solution the offeror plans to provide
- Federal tax identification number, and principal place of business
- A list of people who prepared the proposal, including their titles
- The name and contact information of company representatives who will respond to proposal inquiries (Section 2.1 of Appendix C)

2.2.2 Offeror Profile and Demographics

Provide a brief history of your company, how it is organized, and how its available products and resources will be used to meet the City's requirements. A detailed list of questions are included in (Section 2.3 – 2.6 of Appendix C)

2.2.3 Technical Proposal

The technical proposal has two sections. All Offerors must document how their proposed solution will meet each of the requirements in the following two technical sections:

- Section 3.3: Covers product technical requirements.
- Section 3.4: Covers service implementation requirements.

2.2.4 Financial Information

The offeror shall provide a complete set of audited financial statements for the past three years. All financial statements should be prepared to generally accept accounting principles. Each offeror should note that the City reserves the right to purchase credit reports and additional financial information as it deems necessary. The offeror shall also provide a copy of its corporate annual report. (Section 2.2 of Appendix C)

2.2.5 Cost Proposal Sheet

Detailed Breakdown and Summary of Costs to provide the proposed Equipment, Software, Licenses, Implementation, Professional Services, Training and Maintenance up to 5-years. Pricing quote shall be good for a minimum of one (1) year from the date of contract execution.

The estimated budget by the City to plan, design, configure, test, and install the solution (hardware, software, licenses, solution implementation, maintenance and training) is 1.6 million dollars ($1,600,000.00). The City will consider proposals above the planned budget amount but may disqualify proposals from further consideration should offeror proposed investment requirements exceed 10% of planned allocations. The final selection of the selected offeror's proposal will be awarded to the solution providing the best capability at the lowest overall total cost of ownership. The final offer will be awarded to the best/lowest proposal meeting the City's requirements and investment objectives. (See Attached Cost Proposal Spreadsheet)

2.3 Project Contact Information

For further information, all interested parties may contact the City at the following emails address:
https://columbus.bonfirehub.com/opportunities/9907/

2.4 Proposal Submission

- The offerors must submit their proposals to the https://columbus.bonfirehub.com/opportunities/9907/ address. Hard copy proposals will not be accepted.
- Please refer to the Vendor Services User Guide. (http://vendors.columbus.gov/layouts/ep/custom/other/VendorUserGuide.pdf) for instructions on submitting attachment(s).
- Proposals shall include:
- A cover letter (Section 2.2.1)

- General & Offeror Requirements (Section 3.1 & Section3.2)
- The Technical Proposal (Section 2.2.3)
  - Product Requirements (Section 3.3 /Appendix A)
  - Service Requirements (Section 3.4 / Appendix B)
- Financial Information (Section 2.2.4)
- Cost Proposal Sheet (Section 2.2.5 / Cost Proposal Spreadsheet)
- Company/Product Questions (Appendix C)
- Proposals shall be limited to eighty (80) pages.
- Proposals in excess of the eighty page limit may be disqualified prior to review.
- Submittals must be received by https://columbus.bonfirehub.com/opportunities/9907/ address no later than August 31, 2018 @ 11:00AM.
- **Late submittals will not be accepted**.
- It is the sole responsibility of the Offeror to see that the DoT properly receives its submittal before the deadline. Offeror shall bear all risks associated with potential delays, whatever the cause.
- Submittals shall become the property of the DoT to be used in any manner and for any purpose the DoT determines is in their best interest. **Once opened, submittals are public information and as such, the City is unable to guarantee the confidentiality of the information contained therein**.

The City will be the sole judge of the qualifications of all prospective offeror proposals and reserves the right to reject any and all submittals without recourse for any purpose.

The City is aware that information contained in the proposals indicates the offeror's current operations. Therefore, use of this information shall be confined to this request and will be treated as confidential.

Offerors shall bear all costs associated with preparing and submitting responses to this RFP, and the subsequent evaluation phase. The City will in no case be responsible for these costs, regardless of the conduct or outcome of the prequalification process, or whether an award is made in whole or part.

2.5 Proposal Evaluation

The evaluation process will comprise:

- A preliminary examination to determine substantial functional and technical responsiveness and a review for the proposal's format and completeness with RFP requirements
- A detailed technical evaluation to determine conformity to product and service requirements.

- A demonstration of proof of concept (POC) requiring demonstration by the offeror of specific product functions and capabilities.

After completing the evaluation phase of the process, the City will enter into financial negotiations with no more than two offerors. The final selection will be based on the satisfactory outcome of these negotiations.

2.5.1 Preliminary Examination

The City will examine the proposals to determine whether they are complete, that the documents have been properly signed, and that they meet the RFP requirements. The City reserves the right to disqualify from further review any proposals deemed non-responsive.

2.5.2 Detailed Technical Evaluation

Technical merits and features will be reviewed against the requirements identified in the product and service requirements sections (Section 3.3 and 3.4) of this document.

Evaluation will also include the fit and integration with related City infrastructure, system environments and business applications.

2.5.3 Proof of Concept (POC):

2.5.3.1 Demonstration

After the detailed technical evaluation phase, a subset of offerors may be required to demonstrate their solution within the City's environment, using City Network or use cases provided by the City, infrastructure and personnel, where appropriate.

2.5.3.2 Logistics

All offerors selected for any POC phase will be given detailed requirements for evaluation in advance. Including instructions for demonstrating various product requirements as part of specific use cases in the POC. The City will have a key contact for any questions relating to the POC phase.

2.5.3.3 POC Deployment

If any POC/demonstration is based on an appliance and/or server, the appliance/server will be provided by the offeror for on-site evaluation purposes at the City's designated location. POCs performed at the offeror site will not be evaluated.

2.5.3.5 Evaluation

Following the execution of the POC project, offerors will meet with a larger group of executives, project team members and other selected individuals to provide a POC review. Offerors will be

required to demonstrate their progress toward completing the POC project, as well as describe in detail the specifics of their solution.

2.6 Scoring

Proposals will be scored by an evaluation committee. Committee participants will review, evaluate, and score each responsive proposal received in accordance with predetermined scoring criteria. The committee will meet as a group to score the RFP responses. The selection process will be broken down into three phases.

2.6.1 **Phase I** Offeror Qualification Assessment

To be considered responsive and to continue in the scoring process, the Offeror must:

a. Provide all required documentation by the requested due date
b. Provide a proposal that is complete and complies with the instructions and requirements as stated herein and per the RFP

2.6.2 **Phase II** Offerors who satisfactorily meet the Phase I criteria will have qualified their submitted proposals for detailed scoring process. In this phase, the Offeror's response will undergo intensive evaluation to be scored against 100 points. 50 points will be weighted for the technical requirements and the remainder 50 points will be scored on the following criteria to select a "short list" of finalists

Evaluation Criteria	Scoring Scheme	Points
Technical Requirements	Appendix A total Points based on the total weighted average score	50
Quality	How well is the solution explained and presented?	5
Feasibility	How easily does the proposal lend itself to review and evaluation?	5
Competence	Does the team possess the required Knowledge of the required solution?	5
Relevant Project Experience	Does the team demonstrate prior experience	5
Cost	Lowest Price to meet requirements for 5 year Total Cost Ownership	30
	Total Points	100

The Technical Requirements is evaluated using a 50 point weighted scoring scheme using the following weight values:

Technical Requirements	Weight Value

Appendix A 3.3.1 - Core Network Hardware Refresh	20
Appendix A 3.3.2 - Spine & Leaf Underlay Network	15
Appendix A 3.3.3 - Firewall Refresh	5
Appendix A 3.3.4 - Dual ISP	5
Appendix A 3.3.5 - Management & Monitoring	5

Each offeror will be graded on the basis of how well their proposed system meets the objectives specified in each of the above Technical Requirement Sections using

1.0 = Excellent in meeting the Technical requirement

0.5 = Meets the Technical requirement to some degree

0.0 = Fails to meet the Technical requirement

Each section has multiple sub-sections and they will be evaluated and scored. The scores in each sub-sections are totaled. An average value is then obtained by dividing the total score by the number of items within the sub-section. A weighted average is now derived by multiplying the average total by the weight value assigned to the specific section. For Example, Offeror1 will get 3.5 points out of 5 points for section 3.3.5 in the technical requirements weighted scoring model. The scores in each sections are totaled to obtain a total point out of 50 for the technical requirements evaluation criteria.

Appendix A 3.3.5	**Offeror1**	**Offeror2**
Based on Appendix A 3.3.5.1	1	0
Based on Appendix A 3.3.5.2	1	0
Based on Appendix A 3.3.5.3	1	0
Based on Appendix A 3.3.5.4	1	0
Based on Appendix A 3.3.5.5	1	1
Based on Appendix A 3.3.5.6	0.5	1
Based on Appendix A 3.3.5.7	1	1
Based on Appendix A 3.3.5.8	0	1
Based on Appendix A 3.3.5.9	0	1
Based on Appendix A 3.3.5.10	0	0.5
Based on Appendix A 3.3.5.11	1	0.5
Based on Appendix A 3.3.5.12	1	1
Based on Appendix A 3.3.5.13	1	0
Based on Appendix A 3.3.5.14	0.5	1
Based on Appendix A 3.3.5.15	0.5	0.5
Based on Appendix A 3.3.5.16	0.5	0.5
Based on Appendix A 3.3.5.17	1	0

Total	12	9
Average	0.7	0.5
Weighted Average	3.5	2.6

2.6.3 **Phase III** At the sole discretion of the City, a finalist Offeror may be directly selected from the group of semi-finalists, based upon total point scores. Alternatively, the City may elect to schedule Offeror visual presentations of their solution. Semi-finalist will be required to submit best and final pricing (BAFO) prior to the oral presentation. At the end of Phase III, a finalist Offeror will be selected, based primarily, but not solely* on lowest cost.

2.7 Notification of Award

The award will be based on the evaluation of the RFP response, the POC results, and the satisfactory outcome of financial negotiations.

After the contract has been awarded, City will notify the unsuccessful offerors regarding the RFP outcome via email.

The City reserves the right to rescind an awarded contract in the event that claims or representations by the offeror of the winning submission are subsequently proven false or fraudulent. In the event that such action is necessary, City will be the sole arbiter of the selection of a new offeror, which may or may not include reissuing the RFP or selecting a previously submitted proposal.

2.8 Proposed Award Schedule

Table 1: RFP Reference Time Table

RFP Sequence of Events	
o Dates of Advertisement - RFP/RFP Issued	August 9, 2018
o Date of Walkthrough	August 15, 2018
o Written questions due from Offerors	August 17, 2018
o Responses to questions from City	August 24, 2018
o Proposals Due/Opened	August 31, 2018
o Shortlisted offerors notified	September 7, 2018
Round 2	
o Additional Discussions/Presentations Completed	TBD

o Intent to Award	TBD

3.0 General & Offeror Requirements (Section 3.1 & Section3.2)

3.1 General Requirements:

3.1.1 **Term:** The contract awarded as a result of this proposal is for a one time purchase which includes all licensing, training, warranty and support for a period of 5 years. The contract period shall be for one (1) year and starts on the day that the purchase order confirmed by the City Auditor Acknowledged and agreed. All hardware, software, and subscription-based services included in our proposal carry a 5 year term. Implementation within the term of a 1 year contract is accepted.

3.1.2 **Annual Extension:** The term of this agreement shall be one year from the date of a confirmed purchase order. This agreement is not subject to automatic renewal. However, upon mutual agreement, to include same pricing and terms and conditions as those set forth, the services may be continued for two additional one-year terms. Future renewals of this agreement shall require appropriation and authorization of funds by the Council of the City of Columbus, the Columbus City Auditor and approved by all parties having jurisdiction thereof.

Acknowledged and agreed.

3.1.3 **Pricing:** Respondents to this RFP are required to propose firm and fixed costs including all fees, FOB Destination, Freight Prepaid and Allowed. These costs must include out-of-pocket expenses, including travel expenses. Price proposals that do not offer comprehensive costs (including all out-of-pocket and travel expenses) may not be considered. Acknowledged and agreed. As Cadenza LLC is headquartered in Columbus, Ohio, no travel expenses are required as part of our proposal.

3.1.3.1 **Escalator Clause**: No adjustment of the discount shall be granted during the first twelve (12) months duration of an awarded contract. Thereafter no more than two such adjustments may occur during the life of the contract. In the event the supplier receives a general price increase in the cost of the finished product contracted for, due to increase in the cost of raw materials, labor, freight, etc., upon giving thirty (30) days prior notice and proper documentation as proof, said adjustment in addition to the price quoted herein, may be permitted, subject to the sole discretion of the City of Columbus Finance and Management Director. In the event any such adjustment is granted, no adjustment shall be permitted on orders received by supplier which are in process or filled but awaiting shipment prior to the increase. All price decreases inure to the benefit of the City of Columbus. The written notice and following documentation shall be sent to: City of Columbus Department of Technology contract manager or designee. Acknowledged and agreed.

3.1.3.2 Travel expenses must be incorporated in the hourly rate.

Otherwise, expenses will be reimbursed by the city per the city's standard reimbursement polices (attached to this RFP).
Acknowledged and agreed. As Cadenza LLC is headquartered in Columbus, Ohio, no travel expenses are required as part of our proposal.

3.1.3.3 No additional costs, such as taxes, parking or other associated costs may be charged separately for this work. Offeror's sole compensation for the duties described herein shall be the billings at the Offeror's hourly rate and/or the cost of the products.

Acknowledged and agreed.

3.1.3.4 A complete maintenance and warranty agreement must be included as part of the offeror's proposal, including all options available for extended coverage and full pricing details for each level of coverage. Offerors should include pricing for support and maintenance coverage for up to 5 years. The support and maintenance coverage options should be included for all hardware and software components. All pricing must include manufacturer warranty up to 5 years. All manufacturer warranties will be passed on to the City of Columbus.

Acknowledged and agreed. All hardware, software, and subscription-based services included in our proposal carry a 5 year term. A complete list of support levels available from Juniper Networks is available here: https://www.juniper.net/assets/us/en/local/pdf/datasheets/1000326-en.pdf

3.2 Offeror Requirements:

The City will use the requirements of this section to determine if each offeror meets the minimum standards to be considered a responsible offeror. **Please print, complete and attach** Reference pages and attach any supplemental pages as may be necessary to meet these requirements. **For instructions on how to attach a document to your RFP, go to** https://columbus.bonfirehub.com/opportunities/9907/
Acknowledged and agreed.

3.2.1 **Experience Required:** Documentation shall include (at a minimum) information meeting the following criteria.

3.2.1.1 **Equipment Support and Warranty Capabilities:** Offerors must document, and submit in a letter attached to the RFP, their capability of providing the equipment, implementation, support and warranty service specified herein. Cadenza LLC is an authorized Juniper Networks Elite level partner. This puts Cadenza LLC at the highest tier of Juniper partnership allowing us to provide Juniper hardware, software, maintenance, and

training products. We have included a letter from Juniper Networks certifying our status as an Elite level partner as an attachment to our response.

3.2.1.1.1	All equipment in the offeror's proposal must be warranted by the manufacturer to be free of defects in equipment, software, support and services, and workmanship for a period of at least five years following final completion by offeror and acceptance by the City. Acceptance by the City commence on when the new solution is placed into City's production network. Acknowledged and agreed. All products in our proposal are delivered new in box from Juniper Networks and titled directly to the City of Columbus.
3.2.1.1.2	During the warranty period, and any subsequent maintenance agreement, any defective hardware and software components shall be repaired or replaced at no cost to the City. Acknowledged and agreed. Juniper Care support is included on all hardware components in our proposal. Upon determination by Juniper's Technical Assistance Center (JTAC) that a component is defective, Juniper will provide a like for like replacement to the City of Columbus.
3.2.1.1.3	During the implementation period, the offeror must supply no more than a 4-hour response to major problems directly with the equipment manufacturer, 24 hours a day, and 7 days a week. Acknowledged and agreed. All products in our proposal carry 24x7x365 phone support directly from Juniper TAC.
3.2.1.1.5	Offeror must provide a 24hour or better hardware RMA response for all components in the solution. Acknowledged and agreed. All hardware components in our proposal carry 5 years of Next Business Day hardware replacement.
3.2.1.1.6	Technicians must be certified to support any hardware and software implemented as a part of this project. Acknowledged and agreed. Technical leads for this implementation will be cross certified by Juniper Networks, VMware, and Cisco Systems.
3.2.1.1.7	The City staff shall have the ability to call the manufacturer directly during the support and warranty period of all components of the proposed solution. Acknowledged and agreed. All J-Care service agreements will be titled to the City of Columbus given their staff direct access to JTAC at all times.

3.2.1.2 **Manufacturer Relationship:** The offeror shall provide the history of their relationship with manufacturer(s) that will potentially be providing these types of equipment/parts and warranty service for the past five years, including but not limited to the following:

a) Length of the relationship

Cadenza LLC has been a Juniper Networks partner since September 2015.

b) Level of the relationship

Cadenza LLC is a Juniper Elite level partner representing the highest level of partnership currently offered by Juniper.

c) A brief history of the relationship

Cadenza LLC was founded in 2009 as a network design and engineering firm focused on complex enterprise networking. Cadenza architects watched many large enterprises struggle to deploy and maintain large networks due to lack of automation, instrumentation, and software programmability. After a rigorous technical evaluation, Cadenza chose to partner with Juniper Networks due to their single, unified, operating system Junos as well as their ability to automate network deployments, changes, and security incident response.

Cadenza LLC has been on leading edge of deploying Juniper technology including routing, switching, next generation firewall, network function virtualization, and automated cyber security response.

3.2.2 **References:** The Offeror must have at least three reference customers with similar requirements to the services being requested. Customer references should include at least one from (i) the same market vertical of The City of Columbus, (ii) the same geographic region of the City of Columbus, and (iii) a recent deployment (during the past 18 months). References should include information about the contract (specific products in use, date of contract execution, "go live" date and any services provided), as well as contact information for the client's project manager or other senior staff members familiar with the project. The City reserves the right to contact these references and discuss the client's level of satisfaction with the offeror and its products.

3.2.2.1 **Contact Information Required:** The reference contact information shall include the customer name, customer e-mail address, street address, telephone number, fax number, contact name and equipment purchase date.

3.2.2.2 **Equipment / Service Information:** The reference shall include a description of the equipment/parts provided and type of warranty service that was provided.

Cadenza Client References

Client: Management Council of the Ohio Education Computing Network (MCOECN)
Project: NSX ESG and DLR redesign, data center spine leaf deployment, and Cisco ASA to SRX conversion.
Date of Deployment: November, 2017
Services Provided: Design, migration, and implementation professional services.
Contact: Scott Gaughan, Director of Network Services
Phone: 614-571-0005
Email: scott.gaughan@managementcouncil.org

Client: Abercrombie & Fitch Co.
Project: Migration of existing Cisco ASA based security functionality to High End SRX appliances.
Date of Deployment: September, 2017
Services Provided: Design, migration, and implementation professional services.
Contact: Todd Moyer, IT Director
Phone: 614-283-6254
Email: todd_moyer@anfcorp.com

Client: Wolters Kluwer
Project: Design, test, and deploy a multipoint VPN solution allowing island NSX deployments to securely connect to a global MPLS underlay backbone.
Date of Deployment: June, 2018
Services Provided: NSX design review, Cisco Dynamic Multipoint VPN integration with NSX ESGs, global IP routing design and support.
Contact: Mike Keller, Global Domain Network Architect
Phone: 212-894-8507
Email: mike.keller@wolterskluwer.com

References Provided by Juniper Networks

Juniper End User: City of Dublin
Project: 100G Routing and Switch for Dublink Fiber Optic Network Deployment
Date of Deployment: 2016
Contact: Doug McCollough, Chief Information Officer
Phone: 614-410-4412
Email: dmccollough@dublin.oh.us

Juniper End User: City of Hilliard
Project: LAN Switch and Security Deployment
Date of Deployment: December, 2017
Contact: Adam Maynard
Phone: 614-334-2471

3.2.3 **Subcontractor Information Required:** If subcontractor(s) are to be used, please list names, addresses, telephone numbers and a contact person for each subcontractor. All subcontracts must have valid contract compliance certificationShould the offeror use subcontractors, the City shall use the offeror as the primary contact point.

Cadenza LLC will not make use of any subcontractors as part of this proposal.

3.2.4 **Non-Disclosure:** The City intends to require the successful offeror to sign a mutual non-disclosure agreement typical of industry at some point during the engagement. The Offeror understands and agrees that:

Acknowledged and agreed.

4.0 ORDERING, DELIVERY and INVOICING

4.1 **Ordering Procedure:** A written purchase order will be established by the Director of Finance and Management. The Purchase Order will have the delivery information and invoice information.

4.2 **Delivery days after Order:** Offeror shall insert in the "Discount" tab of the RFP the Lead Time expressed as the number of calendar days after receipt of order that delivery will be made. Vendors shall state actual delivery time in calendar days in the space provided under Delivery/Payment Terms. Delivery time may be a factor in determining award of RFP. Failure to deliver in the days proposed may lead the City to consider the contract holder in partial or full breach of the contract. In the case of such breach, the City reserves the right to pursue all remedies and actions available under this contract and relevant law.

4.2.1 **Delivery Location:** The equipment will be delivered FOB Destination Freight Prepaid and Allowed (Seller Bears All Freight Costs) to:

City of Columbus, Department of Technology

1601 Arlingate Lane

Columbus, Ohio 43228

Inside delivery no dock available, City of Columbus employees will not be available to assist in unloading.

4.2.2 The City of Columbus requires no less than twenty-four (24) hours advance notice before the actual delivery. Delivery can be made Monday through Friday 7:00 AM – 2:30 PM (local time), except on a City of Columbus recognized holiday. City of Columbus personnel will uncrate any carton packaging. The contact information and delivery location will be will be included on the Purchase Order.

4.3 **Packaging**: All items must be packaged in the minimum standard packing material designed to protect against damage during shipment. Note the use of Environmentally Friendly materials is encouraged.

4.4 **Invoicing**: Each invoice shall show the City Purchase Order number, a brief description identifying the item, the unit price, and the total amount. The invoice amount must exactly match the purchase order amount in accordance with the RFP proposal. All Invoices should be mailed to the following address to ensure proper payment:

City of Columbus, Department of Technology, Fiscal Office

PO Box 2949

Columbus, Ohio 43216

5.0 **Insurance Requirements and Workers Compensation:** Successful Offeror is required to provide the following before final execution of the contract:

5.1 **Liability Insurance:** The contractor shall take out and maintain during the life of the contract, such Public Liability (bodily injury and property damage) Insurance as shall protect him from claims from damages for personal injury, including accidental death, as well as from claims for property damage which may arise from operations under the contract, whether such operation be by himself or any subcontractor or by anyone directly or indirectly employed by either of them. Such insurance policy shall include the city as named insured. The Contractor shall maintain coverage of the types and in the amounts specified below. Submitting a certificate of insurance shall evidence proof of such insurance coverage. A contractor's "umbrella" type policy with limits specified below may be submitted for this requirement, with the City as named insured.

The amount of such insurance shall be as follows:

Bodily Injury Liability

Each Person . . . . . .$ 1,000,000.00

Each Accident . . . .$ 1,000,000.00

Property Damage Liability

Each Person . . . . . .$ 1,000,000.00

Each Accident . . . . . .$ 1,000,000.00

Such insurance shall remain in full force and effect during the life of the contract.

Insurance may not be changed or cancelled unless the insured and the City are notified in writing not less than thirty days prior to such change or cancellation. If any part of the contract is sublet, the Contractor is responsible for the part sublet being adequately covered by insurance herein above described.

Contractor assumes all risk of loss and damage to the equipment provided unless loss or damage occurs at the time the operator and equipment are being operated for the purpose designated by the city and such loss or damages is caused by an act of the city or its employee which constitutes gross negligence or wanton misconduct.

5.2 **Workers Compensation:** The successful contractor obtain and

maintain during the life of this contract, adequate worker's compensation insurance for all his employees employed at the site of the project and, in case any work is sublet, the contractor shall require the subcontractor similarly to provide worker's compensation insurance for the latter's employees, unless such employees are covered by the protection afforded by the contractor. The successful contractor shall furnish one (1) copy of the worker's compensation certificate showing that the contractor has paid his industrial insurance premium.

The Technical Proposal (Section 2.2.3)

APPENDIX A

PRODUCT & TECHNICAL REQUIREMENTS

The City wishes to modernize the networking in its primary and secondary datacenters, moving to a spine and leaf architecture, as well as software defined networking. The proposed switches should provide an aggregation point for all servers and services in the datacenter. In addition to Core Network Refresh, the City wishes to upgrade its existing Core Network Firewalls and Content filtering solution.

Offerors shall provide a detailed description of the proposed network architecture, equipment list (Bill of Materials), and network diagram. The solution must meet the requirements for each of the following sections. Cadenza has included Visio diagrams and a full Bill of Materials as attachments to our RFP response.

CORE Network Hardware Refresh

3.3.1.1 Replacement of existing Cisco Catalyst 6500 Core Data Center Network Hardware at both Datacenters where each Data center will need to have 2 CORE switches with at least 24 line rate 100Gb ports (each port should also support 40Gb operation), and 48 x 1Gb/10Gb SFP+ ports
Cadenza proposes a pair of Juniper QFX 10008 module core switches be deployed at each data center. As proposed, each switch is equipment with 30 line rate 40/100G ports, 60 line rate 1/10G ports, and 4 line rate 40G ports. Additionally, each switch will have 6 open slots capable of supporting additional interfaces ranging from 1-200G including coherent

DWDM and MACSEC support.

3.3.1.2 Introduce 4 Fault Domains and provide separation for CORE networking, Spine & Leaf for Server Farms (refer to 3.3.3), MAN, Internet Edge Networking (ref 3.3.5) by providing dedicated switching hardware.

Agreed and acknowledged. As detailed on our attached Visio, core, spine/leaf, MAN, and Internet Edge are all on physically separate devices.

3.3.1.2.1 Replacement of the MAN Termination capacity on existing Cisco Catalyst 6500 Core Data Center Network Hardware at both Datacenters

3.3.1.2.2 Require two redundant 48 port 1Gb/10Gb SFP+ MAN switches per Data Center with 4 x 40Gb uplinks to Core switch (or better) to migrate the existing MAN termination from the Catalyst 6500's

Cadenza has proposed the QFX5100-48S platform supporting 48 x 1/10G SFP+ ports as well as 6 x 40G ports.

3.3.1.2.3 SFP Count and Type for MAN sites (33 Long haul LH and 40 Extended Long Haul ZX) Juniper equivalents of Cisco LH and ZX SFP modules have been included in our proposal.

3.3.1.3 Migration of Existing Fabric Path based DCI (Data Center Interconnect) to the new solution

Our proposal includes QFX5210 spine switches capable of functioning as VXLAN gateways. The spine switches in both data centers will replace existing Fabric Path layer 2 DCI with like functionality via VXLAN.

3.3.1.3.1 Upgrade of existing Fiber based DCI from 10G to 100G optics, single-mode fiber

Our proposal includes 4 100G ER4L optics capable of a maximum range of 40km on a pair of single mode fiber. The City's quoted worst performing dark fiber run of 102,383' with -10.2dB of loss is within the ER4L supported range. The city is responsible for providing at least 2 single mode fiber pairs matching the above quoted performance characteristics (or better) to allow 100G DCI operation over ER4L optics.

3.3.1.3.2 DCI protocol(s) to facilitate Layer-2 extension to the other Data Center.

DCI for brownfield VLAN extension will be accomplished via spine to spine VXLAN encapsulation. DCI for green field VLANs should be performed by NSX's native OVSDB / VXLAN control plane.

3.3.1.3.3 High availability and virtualization such as supporting First Hop

Redundancy Protocol (FHRP) and FHRP localization capability over DCI.

End host default gateways can be localized per DC if desired. All hardware in our proposal is redundant allowing control plane protocols to survive a single point of failure.

3.3.1.4 Data Centers will function as active/active as well as backup and failover for the other Data Center.

Agreed and acknowledged. Our proposal contains no blocked links allowing all links in both data centers to be simultaneously active.

3.3.1.5 Support Layer-3 features such as Bi-Directional Forwarding Detection (BFD), Virtual routing and forwarding (VRF) and Policy based routing (PBR).

All QFX and SRX devices in our proposal support BFD, VRF, and PBR as proposed. The EX4300 switches in our proposal support these features however required additional licensing. This licensing was not included in our proposal as EX4300s are only being proposed for low capacity, layer 2, brown field VLAN support.

3.3.1.6 Support Layer 2 IEEE 802.1p (CoS) and DSCP based classification and remarking, policing, and protection of voice traffic following industry standards for QoS.

All equipment in our proposal supports rewriting of the 802.1p (CoS) and IP DSCP byte. All equipment also supports policing and expedited forwarding as required for real time voice and video.

3.3.1.7 Ability to support equal cost multi-path (ECMP) over L2/L3 networks

Yes – L2 ECMP is achieved through the use of LACP to end devices and MC-LAG between upstream switches. L3 ECMP is supported and recommended.

3.3.1.8 The fabric needs to simultaneously support multiple overlay networks based on various protocols as well as traditional L2/L3 network protocols.

Our proposal does exact this. To avoid large, disruptive, change windows our proposal continues support for traditional L2/L3 networking in the brown field areas of the network while migrating to an IP Fabric in the green field areas to support VXLAN and NSX.

3.3.1.9 Support Layer 3 unicast dynamic routing protocols, including OSPF and BGP. Vendor can list other protocols supported and should specify if any are proprietary.

All QFX and SRX devices in our proposal support OSPF, BGP, and IS-IS.

3.3.1.10 Support for IPv4 and IPv6 routing/forwarding.

All QFX and SRX devices in our proposal have native support for IPv4 and IPv6 routing.

3.3.1.11 Supports multicast protocols, including PIM, IGMP, Snooping and MSDP. Vendor can list other protocols supported and should specify if any are proprietary.

All QFX devices support PIM, IGMP, IGMP Snooping, and MSDP.

3.3.1.12 Solution supports first-hop gateway routing protocols, including VRRP. Vendor can list other protocols supported and should specify if any are proprietary.

All equipment in our solution supports VRRP.

3.3.1.13 Solution supports traffic mirroring capability, commonly referred to as “port mirrors”, “tap” or “span” ports. Identify the mirroring capacity (number of ports per device, capability for VLAN mirroring, etc.)

All equipment in our solution as the ability to mirror or capture traffic for off box analysis.

3.3.1.14 Solution supports VLAN tagging, VLAN trunking, Link Aggregation (LACP) and multi-chassis link aggregation.

All QFX equipment in our solution supports VLAN tagging, VLAN trunking, LACP, and multi-chassis link aggregation (MC-LAG). All EX and SRX equipment support the same feature set with the exception of not supporting MC-LAG.

3.3.1.15 SFPs, patch cables, etc., and other associated equipment should be included to meet requirements per Offeror's proposed solution.

Agreed and acknowledged.

3.3.1.16 Support Multi - Tenant environment and provide Role Based Access Control.

All components (EX, QFX, SRX) run the same Junos Operating System. Junos supports per command RBAC and accounting.

3.3.2 Spine & Leaf CLOS Architecture for Underlay Network

3.3.2.1 In each datacenter, a pair of spine switches will be deployed to provide a

highly robust and redundant server distribution layer while the leaf switches will be paired together in a top of rack implementation to provide redundancy to the spine. Spine switches are in addition to CORE switches. Leaf switches will be the replacement for the following models that the City uses

Our proposal includes two QFX 5210 spine switches per data center supporting 64 x 100G line rate ports.

3.3.2.1.1 Cisco Nexus 5548 (2 per Data center, 48 x 10Gb ports Multimode Fiber per switch)

Our proposal includes QFX 5200-48Y switches as replacements. The QFX 5200-48Y switch provides 48 x 10/25G and 6 x 100G line rate ports.

3.3.2.1.2 Cisco Nexus 2248TP-E 1 GE FEX (12 per Data center, 48 x 1Gb ports copper per switch)

Our proposal includes EX4300-48T switches as replacements. The EX4300-48T switch provides 48 x 1G copper, 4 x 40G ports, and an optional expansion slot supporting up to 4 x 10GE SFP+ ports.

3.3.2.1.3 Cisco Nexus 2232PP 10 GE FEX (4 per Data center, 32 x 10Gb ports Multimode Fiber per switch)

Our proposal includes QFX 5200-48Y switches as replacements. The QFX 5200-48Y switch provides 48 x 10/25G and 6 x 100G line rate ports.

3.3.2.2 Solution supports software-defined networking and overlay tunneling capabilities such as OpenFlow, NVGRE, GENEVE and VXLAN.

The QFX platforms proposed can support controllerless SDN (EVPN / VXLAN) or controller based SDN (OVSDB / VXLAN) on a VMware NSX or Juniper Contrail controller.

3.3.2.3 Open standards design using BGP, OSPF, ECMP, and BFD

Yes. See response to item 3.3.1.5 and 3.3.1.9.

3.3.2.4 Ethernet or equivalent Fabric technology to eliminate Spanning Tree Protocol (STP)

Our proposal eliminates STP through the use of an IP Fabric in the green field areas of the network and MC-LAG in the brown field areas.

3.3.2.5 All links active / active with sub-second failover times

As detailed in our attached Visio, all links in our solution are active. Sub-second failover times are achieved through the use of BFD and in layer 2 brown field areas of the network LACP / MC-LAG timers.

3.3.2.6 Zero Touch Provisioning enabled on all switches.

All equipment in our proposal supports Juniper ZTP. QFX and EX switches can be ZTP provisioned from the Junos Space Network Director platform which is included in our proposal.

3.3.2.7 Central controller for underlay provisioning and management

Junos Space Network Director with Cloud Analytics allows for full life cycle management of the underlay network but also supports flow mapping between underlay and overlay. Network Director provides the following as proposed:

Fabric automation
fully automates the provisioning, configuration, and deployment of complex underlay and virtualized fabric topologies, providing comprehensive pre- and post-deployment support and management for Layer 2 and Layer 3 fabrics, as well as Junos Fusion Enterprise and Junos Fusion Data Center fabrics. Junos Fusion is a single-tier architecture that allows an enterprise network to be managed as a single system.

•

Zero touch provisioning
(ZTP) simplifies the deployment of networks without requiring user intervention, providing policy-driven plug-and-play provisioning and network bring-up operations for both fabrics and individual devices.

•

Bulk provisioning
enables faster service rollout and activation while protecting against configuration errors with profile-based and pre-validated configurations. Bulk operations can be performed at logical (access, aggregation, core) or location (site, building, floor, rack) levels.

•

Automated access port provisioning supports plug-and-play operations. Network Director detects the end point device types (such as wireless access points and VoIP phones) that are plugged into ports and automatically provisions all port-related parameters including VLAN, 802.1x, and security policies to comply with port profiles.

Performance Analyzer
provides real-time and trended monitoring of tenants, hosts, VMs, fabrics, and ports, as well as high-frequency monitoring that gathers valuable performance data for tracking queue depth and heat-map visualization. Network Director analyzes the entire network, using heat-maps to identify over- and under-utilized ports, latency, and top VMs, users, devices, and ports.

•

Network Traffic Analyzer
proactively monitors network usage to find the sources of network traffic spikes. Incorporating an automated policy-driven sFlow collector and flow analysis, Network Traffic Analyzer quickly identifies and isolates users, applications and protocols consuming the most bandwidth.

•

Flow Path Analyzer
provides operational and diagnostic capabilities that trace connectivity between applications and flows by correlating network telemetry data with the application. Flow Path Analyzer visualizes network paths between leaf and spine switches for a given flow/application, correlating congested ports

with high-latency events and identifying impacted or unhealthy VMs, applications, and hosts.

- Overlay and Underlay Analyzer
  provides full visibility, performance management, and troubleshooting capabilities for physical and virtualized overlay networks in VMware Virtual Extensible LAN (VXLAN) and controller-less environments. It provides a consolidated and correlated
  view of VMs, hosts, fabrics, and overlay and underlay networks with full end-to-end network and flow visibility and analysis.
- VM Analyzer
  provides real-time physical and virtual topology views, tracks vMotion activity including virtual machine creation, deletion, and moves, and maintains complete virtual network inventory.
- Fabric Analyzer
  monitors and analyzes the health of the entire network fabric, including IP Fabric, Virtual Chassis Fabric configurations, and Juniper Networks QFabric® System, increasing service availability.

3.3.2.8 Spine Count: 2 per Data Center

This requirement is met by the QFX 5210 spine switches in our proposal.

3.3.2.8.1 Redundant 1 x 100 Gb line rate connection from each CORE to each Spine using multi-mode fiber

This requirement is met by the QFX 5210 spine switches in our proposal.

3.3.2.8.2 Each spine requires 64 x 100G SFP+ fiber ports line rate, and ability to support all requested 12 x 1G copper leaves.

This requirement is met by the QFX 5210 spine switches in our proposal.

3.3.2.9 10G/25G Fiber Leaf Count: 14 per Data Center (Racked on 4 New Racks and 3 Existing Racks)

This requirement is met by the QFX 5200-48Y leaf switches in our proposal.

3.3.2.9.1 48 x 10G/25G SFP+ ports per leaf switch to end host devices

This requirement is met by the QFX 5200-48Y leaf switches in our proposal.

3.3.2.9.2 Redundant 2 x 100 Gb line rate connections from each leaf to each spine switch using multi-mode fiber (400G total uplink bandwidth from each leaf)

This requirement is met by the QFX 5200-48Y leaf switches in our proposal.

3.3.2.10 1G Copper Leaf Count: 12 per Data Center (6 existing Racks)

This requirement is met by the EX4300-48T switches in our proposal.

3.3.2.10.1 48 x 1G Copper ports per leaf switch to end host devices

This requirement is met by the EX4300-48T switches in our proposal.

3.3.2.10.2 Redundant 1 x 10Gb line rate or better connections from each leaf to each spine switch using multi-mode fiber (at least 20G total uplink bandwidth from each leaf)

This requirement is met by the EX4300-48T switches in our proposal.

3.3.2.11 Spine and Core placement will be in the same rack. The City has pretermed fiber distribution to accommodate cable Distance and connectivity between Leaf and Spine

Cadenza LLC is proposing the use of active optical cables (AOCs) to reduce cost given the number of requested 100G uplinks.

3.3.2.12 Support for Jumbo frames and Pause frames on all ports

Jumbo frames are supported on all Ethernet ports.

3.3.2.13 SFPs, Ethernet/Fiber cables, Active Optical Cabling and other associated equipment interconnecting only the network devices in the proposal should be included to meet requirements per Offeror's proposed solution.
Acknowledged and agreed.

3.3.2.14 Support Layer-3 features such as Bi-Directional Forwarding Detection (BFD), Virtual routing and forwarding (VRF) and Policy based routing (PBR).

All QFX equipment in our proposal supports BFD, VRF, and PBR.

3.3.2.15 Support VXLAN (Virtual Extensible LAN) and Ethernet VPNs (EVPNs) technologies and micro-segmentations over the physical network and VTEP hardware.

All QFX equipment in our proposal supports VXLAN, EVPN, and hardware VTEP for NSX. Micro-segmentation can be achieved by deploying NSX and then leveraging hardware VTEP to place physical devices logically within NSX"s security.

3.3.2.16 True line rate forwarding and receiving between all ports within the same leaf (Direct communication for devices are connected to the same leaf.)

Traffic will always take the most direct path to a host in our design due to the use of MC-LAG for layer 2 environments and NSX OVSDB/VXLAN overlay across an IP Fabric for layer 3 environments.

3.3.2.17 The fabric needs to simultaneously support multiple overlay networks based on various protocols as well as traditional L2/L3 network protocols.

Our proposal does exact this. To avoid large, disruptive, change windows our proposal continues support for traditional L2/L3 networking in the brown field areas of the network while migrating to an IP Fabric in the green field areas to support VXLAN and NSX.

Firewall Refresh Requirements (Optional)

The City has purchased a total of 2 Cisco Firepower 4100 appliances but has notyet deployed into production. As part of this proposal, Offerors shall provide any of the following options

3.3.3.1 Option1: Implement the already purchased Firepower 4100 appliances to replace the existing Cisco Firewalls and SourceFire Appliances.

3.3.3.2 Option2: provide Trade in credit and replace with an alternate security solution that duplicates all current security functions

Cadenza LLC will provide the City with a trade in credit of $100,000 for the 2 Cisco Firepower 4120 appliances with the purchase of our proposed Juniper SRX 4100 alternate. Note that the City must sign ownership of the appliances over to Cadenza LLC to receive the trade in credit.

Regardless of the above options chosen, Offeror must migrate existing Firewall rules, Remote Access VPN, Site to Site VPN, IPS, Malware Analysis, NAT, and Content Filtering.

Cadenza LL will implement all of the above features on the SRX 4100 solution with the exception of Remote Access VPN which we recommend be deployed on NSX's Remote Access solution to provide a more cost efficient remote access VPN solution.

Dual ISP Requirements

3.3.4.1 Router Implementation services to relocate one existing Cisco edge router from primary to secondary data center.
Acknowledged and agreed.

3.3.4.2 Provide 4 access switches with each access switch having a 48 x 1G copper ports and 4 x 10Gb SFP+ ports to physically terminate DMZ Services.

The EX4300-48T switches in our proposal meet this requirement.

3.3.4.3 Provide a duplicate set of equipment for the second data center and implementation services for all equipment listed in Appendix A section 3.3.4

The EX4300-48T switches in our proposal meet this requirement.

3.3.4.4 Ability to actively provide load balanced internet services from both datacenters concurrently

Our proposed implementation includes consulting services to enhance the existing Internet facing BGP requirement to meet this goal.

Redundancy, Management, & Monitoring

3.3.5.1 Provide for a Redundant Network configuration both between and within datacenters with sub second convergence for all equipment in the proposal
Our solution is completely redundant both intra and inter data center. In the event of a single point of failure, BFD will be the primary failure detection mechanism. BFD will allow for sub second convergence to an alternate surviving path.

3.3.5.2 Intuitive easy-to-use management interfaces with features such as single interface / portal for management

Junos Space Network Director and Security Director provide single pane of glass management for both the hardware underlay and security perimeter. Datasheets can be found here:

Network Director:
https://www.juniper.net/assets/fr/fr/local/pdf/datasheets/1000428-en.pdf

Security Director:

https://www.juniper.net/assets/us/en/local/pdf/datasheets/1000332-en.pdf

3.3.5.3 Non-intrusive OS upgrades with minimal downtime on all components of the newly implemented solution such as spines, leaves, Core and Edge devices

Our proposal has been purpose built to allow for OS upgrades with minimal downtime. Our choice of an IP Fabric as the primary data center fabric technology allows the control plane of the new data center to be completely distributed. Having a distributed control plane allows for a single device to be reloaded with minimal impact thanks to Graceful Routing Engine Restart and Nonstop Forwarding.

3.3.5.4 Self-healing configuration rollback

Juniper Networks pioneered intelligent configuration management in the networking industry. All devices in our proposal run the Junos OS. Junos is unique among network operating systems in that configuration changes are made to a 'candidate' configuration file prior to being committed into the data plane. This allows network changes to be completely pretested on production devices. Junos will syntax check all changes without implementing them giving network engineers peace of mind that their change will go in as planned.

In the event a configuration change does need to be rolled back, Junos stores up to 50 previous versions of the configuration file and can rollback to one of them in a single command.

For the worst outages – where a change breaks your ability to manage (and fix) the change, Junos has the "Commit Confirmed" feature allowing a change to be committed with an automatic rollback timer if the change is not confirmed a second time.

3.3.5.5 Ability to police BUM traffic at the Data Center Edge

BUM traffic can be dropped or limited on the EX4300 and QFX platforms in our proposal.

3.3.5.6 Shall support OOB (out-of-band) management and should support AAA using RADIUS, TACACS+.

All devices in our proposal have out of band management ports.

3.3.5.7 Ability to automate configuration jobs along with auto discovers capability, software upgrades with rollback option.

Configuration jobs can be automated from Junos Space or by configuring the network device to implement a pre-built configuration script at a specific time.

3.3.5.8 Vendor shall provide a software based lab environment for testing critical production changes on a manufacturer cloud based portal (or) on City premise

Juniper provides software versions of the SRX and QFX (vSRX and vQFX) platforms. These can be run on a variety of common hypervisors and allow for the mock up and testing of critical production changes.

3.3.5.9 Integrated real-time packet capturing and analysis.

All devices in our proposal have the ability to capture or mirror traffic for analysis.

3.3.5.10 Shall support syslog, snmp (v1, v2c and v3) and RMON/RMON-II protocols.

Junos devices support SNMP read only access.

3.3.5.11 Shall support advanced monitoring feature such as port-mirroring

All devices in our proposal have the ability to capture or mirror traffic for analysis.

3.3.5.12 Shall support network flow generation and reporting in formats such as netFlow, sFlow, or similar

All devices in our proposal support flow based reporting. Additionally, Network Director with the Cloud Analytics Engine serves as a flow collector. In additional to collecting flows the Cloud Analytics Engine can track application flows from underlay to overlay, greatly speeding up troubleshooting.

3.3.5.13 Shall provide network visibility between any two endpoints (Network Node, VM/Server) in terms of latency and packet drops.

The Juniper Cloud Analytics Engine provides this. Datasheet available here: https://www.juniper.net/assets/us/en/local/pdf/datasheets/1000528-en.pdf

3.3.5.14 Performance monitoring of the system and fault analysis and recovery.

Junos Space Users receive free access to the Juniper Service Now Service Insight application. Service Insight proactively monitors for hardware and software fights as well as automates JTAC case creation. Datasheet available here: https://www.juniper.net/assets/fr/fr/local/pdf/datasheets/1000331-en.pdf

3.3.5.15 Provides a system monitoring status and alert notification capability

Junos Space provides device monitoring with alerting capability.

3.3.5.16 Support integrations with existing virtualization technologies VMware vSphere 6.5, Splunk log collection software,

Junos Space Network Director and Security Director have native integrations with VMware vCenter. Juniper Networks publishes the Juniper Splunk app which contains prebuilt dashboards for Juniper SRX appliances. Additionally, all Junos devices can send SYSLOG information to Splunk in several formats.

3.3.5.17 Support existing City's network routed design with EIGRP and compatibility with City's existing Cisco unified communications for voice.

The Juniper solution as proposed provides interoperability with EIGRP environments through use of industry standard routing protocols. The EX and QFX platforms both provide low latency switching as well as robust quality of service to project unified communications traffic.

APPENDIX B

SERVICE & IMPLEMENTATION REQUIREMENTS

The City will provide floor space for racks and adequate power and grounding plus assist with uncrating and racking new equipment. The City will, in coordination with the Offeror, perform all tasks on the City's network necessary for the system to integrate with and operate on the network except those explicitly identified here, the Offeror proposal, or negotiated in contract. The solution must meet the following:

Project Management Service Requirements

It is important for the selected Offeror to provide support for an organized transition from the current systems that are in place to any new systems; ensuring internal communications are maintained and the ease of use through the transition is emphasized to City staff and City customers. Vendor shall assign a qualified project manager to coordinate delivery and implementation services tasks and deliver a complete solution design and project plan, including:

3.4.1.1 Detailed Project Management Plan for implementing the proposed solution and supply a complete description of the key activities and responsibilities required for the installation of the proposed system(s). The plan shall include narrative information and detailed project milestone and schedule information presented in Microsoft Project file format. The Offeror shall include an estimated start time and completion date for the project.

Project Plan attached in .mpp format.

3.4.1.2 Offerors shall outline their implementation plan for the project described in the RFP. The plan should include timetables that address the following:

3.4.1.2.1 Project Management: Provide a description of the Offeror's management team for this project. List all key personnel and their qualifications.

Jeremy O'Dette – Network Architect with 18 years of experience designing, deploying, and supporting large scale enterprise networks. Mr. O'Dette has worked with VMware technology dating back to 2000 and has built software defined networks using NSX for years.

Brandon BeCraft – Network Architect with 13 years of experience design, deploying, and automating larger enterprise networks. Mr. BeCraft has automated Juniper switching rollouts for some of the largest interconnect and colocation providers in the world.

Matt Walter – Network Deployment Manager with 8 years of experience managing large scale technology roll out in financials and retail environments.

3.4.1.2.2 Project Schedule: Provide an implementation schedule for the proposed service, including delivery dates, implementation milestones, task relationships and dependencies, and a timeline. The Project schedule also consist of a work responsibility matrix, identifying the tasks the vendor will perform and the tasks the City is expected to perform to successfully implement the proposed system(s).

Project Plan attached in .mpp format.

3.4.1.2.3 Incident management and provide reports online, weekly, upon request

As part of the deployment Cadenza will establish a weekly project status meeting. Progress against milestones, project risks, and any open incidents will be tracking as part of that meeting.

Additionally, Cadenza will provide project and incident management reports online and upon request from City of Columbus personnel.

3.4.1.3 The City reserves the right to require the awarded vendor to replace the assigned project manager at any time, without additional costs to the City, if it is in the best interest of the overall implementation.
Acknowledged and agreed.

Solution Implementation Requirements

Offeror is responsible for complete installation of all hardware and software proposed and must collaborate with City technology staff to develop an appropriate timeline for installation of all equipment. The City reserves the right to terminate an installation or purchase contract on the basis of poor performance. Performance will be based on proposal specifications found within this document. The City will be the sole agent in determining performance of an installer. Vendor will be required to begin engineering and design immediately after vendor award. Vendor must submit resumes of individual(s) performing the implementation. The Offeror must meet the following implementation requirements:

3.4.2.1 CORE Network hardware Implementation and connectivity migration from existing platform to new platform and validate data flows with minimal disruption (Detailed requirements can be found in Appendix A - 3.3.1)

Acknowledged and agreed.

3.4.2.1.1 Hardware implemented to be updated with the most recent fully supported firmware version

Acknowledged and agreed.

3.4.2.2 Build New Spine and Leaf Underlay for SDN based (Detailed requirements

can be found in Appendix A - 3.3.3)

Acknowledged and agreed.

3.4.2.3 Implement redundancy for internet connectivity (Detailed requirements can be found in Appendix A - 3.3.5)

Acknowledged and agreed.

3.4.2.4 (Optional) Firewall and Content Filtering appliance hardware Refresh and implementation (Refer to requirements in Appendix A - 3.3.4)

Acknowledged and agreed.

3.4.2.5 Implementation of VMware NSX Overlay Network
VMware NSX is the City's Software Defined Network (SDN) solution and its ability to integrate closely with L4 – L7 services to support programmatic access to NSX such as SDK python. The City will provide compute resources required to deploy NSX and also provide the VMware licenses required.

Acknowledged and agreed.

3.4.2.5.1 Implement VMware networking components such as NSX, vRealize Network Insight, and App Defense)

Acknowledged and agreed.

3.4.2.5.2 Implement Micro segmentation of East West Traffic using distributed Firewalls for up to 10VMs.

Acknowledged and agreed.

3.4.2.5.3 Implement Edge Services Gateway for firewall, NAT, DHCP, Remote Access VPN, load balancing, and high availability for up to 10 ESG's or ESG cluster

Acknowledged and agreed.

3.4.2.5.4 Implement cross data center VXLAN extension within NSX

Acknowledged and agreed.

3.4.2.5.5 Implement dynamic routing between NSX environment and physical datacenter network

Acknowledged and agreed.

3.4.2.6 All wiring and network items should be installed and thoroughly tested by vendor and City technology support staff at the time of installation. The City can provide new additional multi-mode distribution if required for its existing structured horizontal cabling.

Acknowledged and agreed.

3.4.2.7 Primary installation crew(s) must be the same group of individuals for the entire implementation process for all sites.

Acknowledged and agreed.

Training and Documentation

As a part of the network installation process, designated City technology staff members will be required to be an integral part of the configuration and installation process by having the ability to observe the configuration of core networking and other hardware components. This will enable the appropriate transfer of knowledge to take place in order for City technology staff to properly maintain all networking components implemented.

3.4.3.1 All associated costs for formal training classes; training and reference materials, travel and expenses, and any other associated costs must be included in the submitted proposal.

Acknowledged and agreed.

3.4.3.2 Deliver training necessary for 5 City employees to fully administer the device and device policies on City premises prior to equipment being placed in production.

Cadenza LLC will provide deployment specific training to up to 5 City employees prior to the proposed solution being placed into production. Cadenza's training will be delivered either on site or with Columbus based on the City's preference.

3.4.3.3 Deliver vendor symposiums summaries related to the technology implemented for City employees on City premises; or include vendor symposium event registration for up to 5 City employees as part of their proposal

Cadenza will notify City of Columbus staff of upcoming symposiums from both Juniper Networks and VMware. For the duration of this deployment Cadenza LLC will provide summaries of relevant technology sessions at vendor symposiums.

3.4.3.4 For each aspect of the proposed solution, provide a detailed description of the training the vendor will provide along with pricing and syllabus.

Syllabus for each technology area are below. Pricing has been provided in the RFP Cost Proposal Spreadsheet at $19,800.

Intro to Juniper Networking (1 Day)
Juniper Hardware Platform Intro
EX
QFX
SRX
MX
NFX

Junos Deep Dive
Architecture
CLI Primer
Operational Mode
Configuration Mode
Troubleshooting Tools
Advanced Configuration Management

Junos Switching (2 Days)
LAN Switching Configuration
VLANs and Trunks
LACP
STP variants
MC-LAG
Virtual Chassis
Automating EX Configuration
QFX Family Deep Dive
QFX Virtual Chassis
QFX Virtual Chassis Fabric
MC-LAG on QFX
IP Fabric Fundamentals
VXLAN Configuration
Junos Space Network Director

Junos Security (1 Day)
SRX Platform Introduction
Flow Module Deep Dive
Security Zones
Layer 4 Security Policy
Network Address Translation
IPSec Configuration
Logical Tunnels and Virtual Routers

Advanced Junos Security (1 Day)
AppSecure
Enhanced Web Filtering
Intrusion Prevention
Inline Anti-Virus Filtering
Sky ATP
Junos Space Security Director

Vmware NSX Basics (2 Days)
Vmware NSX Architecture Overview
Deploying Vmware NSX core components
VXLAN Deep Dive
Logical Switching
Logical Routing
Edge Services Gateway Configuration
Dynamic Routing on ESGs and the underlay
Depying Distributed Firewall
NSX Packet flow troubleshooting

NSX SSL VPN
NSX Load Balancing
NSX Integration with Network Director
NSX Integration with Security Director

3.4.3.5 Provide a physical and logical diagram of the proposed solution architecture. This must include all aspects of the underlay and overlay design

Detailed physical and logical diagrams have been provided as part of our RFP response. These diagrams will be further enhanced and expanded over the course of the deployment leaving City staff with a written "as built" documentation.

3.4.3.6 Provide configuration documentation pertaining to all critical aspect of the solution and access to knowledge systems for the duration of the warranty
Acknowledged and agreed. Thorough documentation of the design, key architectural decisions, and configuration standards is part of our normal implementation process.

Implementation and Post Implementation Support

3.4.4.1 Offerors shall provide details of all maintenance and switch over activities and how assistance will be provided to City users.
Acknowledged and agreed. Cadenza staff will work through the City's normal change management process to provide written change implementation plans, verification plans, and back out plans.

3.4.4.2 The installer will be made aware, in writing, of any outstanding problems with an installation within fourteen days of the presentation of the installation for acceptance. The installer will correct any outstanding problems within thirty days from the date of notification. No payment will be made until the City accepts the installation according to proposal specifications.

Acknowledged and agreed.

3.4.4.3 Provide up to 90 day post implementation support and engineering review to assist the city with additional troubleshooting or performance tuning.

Acknowledged and agreed.

3.4.4.4 Provide City staff with documentation on standard operating procedures required to operate the new solution (Examples – Software updates, New ESG, Routing Policy Updates). The City will need all drafts reviewed prior to final acceptance on the documentation provided.

Acknowledged and agreed.

3.4.4.5 New feature testing, failover performance testing validation and documentation

Acknowledged and agreed.

3.4.4.6 Onsite support staff must pass the City background checks

Acknowledged and agreed.

Financial Information (Section 2.2.4)

Financial Information

The offeror shall provide a complete set of audited financial statements for the past three years. All financial statements should be prepared to generally accept accounting principles. Each offeror should note that the City reserves the right to purchase credit reports and additional financial information as it deems necessary. The offeror shall also provide a copy of its corporate annual report. (Section 2.2 of Appendix C)

Cadenza LLC is a privately held company operating as an Ohio Limited Liability Company. We have attached audited financial statements for 2015, 2016, 2017, and 1H18.

Cost Proposal Sheet (Section 2.2.5 / Cost Proposal Spreadsheet)

Cost Proposal Sheet

Detailed Breakdown and Summary of Costs to provide the proposed Equipment, Software, Licenses, Implementation, Professional Services, Training and Maintenance up to 5-years. Pricing quote shall be good for a minimum of one (1) year from the date of contract execution. The estimated budget by the City to plan, design, configure, test, and install the solution (hardware, software, licenses, solution implementation, maintenance and training) is 1.6 million dollars ($1,600,000.00). The City will consider proposals above the planned budget amount but may disqualify proposals from further consideration should offeror proposed investment requirements exceed 10% of planned allocations. The final selection of the selected offeror's proposal will be awarded to the solution providing the best capability at the lowest overall total cost of ownership. The final offer will be awarded to the best/lowest proposal meeting the City's requirements and investment objectives. (See Attached Cost Proposal Spreadsheet)

Cost Proposal Spreadsheet attached.

Company/Product Questions (Appendix C)

APPENDIX C

COMPANY/PRODUCT QUESTIONAIRE

2.1 General Questions

2.1.1 Company name and address

Cadenza LLC

7965 North High Street

Suite 160

Columbus, Ohio 43235

2.1.2 Total number of years in business

9 Years, formed in April 2009.

2.1.3 Total number of years providing the business/service requested

Cadenza has been providing network design and engineering services to enterprise networks since 2009.

2.1.4 Total number of employees

5 full time employees.

2.1.5 Total number of employees dedicated to the type of business/services requested

4 full time technical design and engineering staff.

2.1.6 Total number of current clients (all services)

30

2.1.7 Current number of clients for this type of business/service

8

2.1.8 Public Corporation Y/N; if yes what is stock symbol and on what exchange is it traded?

Cadenza LLC is a privately held company operating as an Ohio Limited Liability Company.

2.1.9 Is your most recent annual report available online? If so please provide Web address. If not please include as attachment.

Cadenza LLC is a privately held company operating as an Ohio Limited Liability Company. We have attached audited financial statements for 2015, 2016, 2017, and 1H18.

2.1.10 Duns Number (If available)

Cadenza LLC's Duns Number is 849326629.

2.1.11 Total Revenues

Revenues for CY17: $1,339,316

Revenues for 1H18: $1,454,643

2.1.12 Please provide 3 current references that we may contact, that have or use the products or services included in this response

References have been included in section 3.2.2 of our RFP response.

2.1.13 Is your company a "Minority Business Enterprise (MBE)?" If so, please send all appropriate certifications along with your response to this document. Cadenza is not certified as a MBE. Cadenza is 50% woman owned.

2.1.14 Please describe any existing or pending business arrangements your firm may have with City or any of its personnel

In the past, Cadenza LLC has provided network consulting services to the City of Columbus. Cadenza LLC does not currently have any active or pending business with the city.

2.1.15 Do you use sub-contractors and/or 3rd party companies in your implementation or installations? If yes, please list the name(s), address(es) and contact information. Cadenza LLC's proposal is being delivered directly, without sue of sub-contractors or 3rd party companies.

2.2 Licensing Methods, Pricing and Costs

2.2.1 Please list the different ways that you license your hardware solution along with the standard pricing applicable for each type.

Our proposal includes products from Juniper's EX, QFX, and SRX product lines. The licensing model for each platform is listed below:

EX: Hardware interfaces are not limited by licensing. The EX platform has two levels of licensing, Enhanced Feature License (EFL) and Advanced Feature License (AFL).

An EFL is required to enable the following features: BFD, CFM 802.1ag, IGMP, MSDP, OSPF, PIM, Real-time Performance monitoring (RPM, RIPng, RPF, virtual router, VRRP.

An AFL is required to enable the following features: MBGP, IS-IS. List price for an EX4300 EFL is EX4300-48-EFL $1,395.

List price for an EX4300 AFL is EX4300-48-AFL $5,995. Full documentation is available here:
https://www.juniper.net/documentation/en_US/junos/topics/concept/ex-series-software-licenses-overview.html

QFX: Hardware interfaces are not limited by licensing on any of the equipment in our proposal. The QFX platform has two levels of licensing, Premium and Advanced.

A Premium license is required to enable the following features: BGP, IS-IS, VXLAN, OVSDB.

An Advanced license is required to enable Premium features as well as MPLS.

List price for Premium and Advanced QFX licenses vary by QFX model. All QFX devices in our proposal carry Premium licensing and pricing for those licenses have been included in our pricing sheet.

SRX: The following features can be licensed on a subscription or perpetual basis:

AppSecure Suite consisting of:

AppTrack – The ability to identify over 4,000 applications base on a layer 7 deep inspection of the packet.

AppFW – The ability to block traffic on a per application bases regardless of transport protocol and port being used.

AppQoS – The ability to shape, police, and remark traffic on a per application basis.

AppRoute – The ability to route traffic out different interfaces based on

application and current network performance levels.

The following features are available on a subscription only basis in 1, 3, or 5 year terms:

IPS – Intrusion Prevention services provided by Juniper's in house maintained IPS signature database.

Enhanced Web Filtering – Web and content filtering based on the Websense / Forcepoint security platform.

Anti-Virus and Anti-Span – Inline scanning and block of network traffic based on the Sophos AV/AS engine.

Sky Advanced Threat Prevention – SkyATP is Juniper's next generation automated malware analysis engine providing protection from zero day exploits.

All SRX devices in our proposal carry a perpetual AppSecure license (Junos Secure Edge / JSE) and a 5 year subscription to IPS, Enhanced Web Filtering, Anti-Virus, Anti-Spam, and SkyATP. Pricing for those licenses have been included in our pricing sheet.

2.2.2 Is there any 3rd party software required? If so please list the software and applicable pricing. Our proposal is all inclusive and does not require 3rd party software outside of the VMware NSX the city has committed to providing.

2.2.3 Please give a listing of your standard Professional Service per hour costs. (i.e. Project Manager - $XXX, Network Engineer - $XXX, etc.)

Cadenza Project Manager $110/hr

Cadenza Resident Engineer $125/hr

Cadenza Resident Architect $165/hr

Cadenza Time and Materials $175/hr

2.2.4 Provide information on pricing for yearly support and/or maintenance. What services and software does the yearly support and/or maintenance include?

Juniper Networks provides six levels of J-Care support as described below. All Juniper Networks products in our proposal carry 5 years of Juniper Care next-Day Delivery coverage.

	Juniper Care Core	Juniper Care Core Plus	Juniper Care Next-Day Delivery	Juniper Care Next-Day Onsite	Juniper Care Same-Day	Juniper Care Same-Day Onsite
Unlimited JTAC 24x7	X	X	X	X	X	X
Software releases	X	X	X	X	X	X
CSC online E-Support	X	X	X	X	X	X
Junos Space Service Now/Service Insight	X	X	X	X	X	X
Return-to-factory		X				
Next-business day-advanced replacement parts delivery			X	X		
Same-day advanced replacement parts delivery					X	X
Onsite technician				X		X

2.2.5 Please provide a soft copy of your standard, Software License Agreement, Maintenance Services Agreement and Service Level Agreements

Juniper Network's current End User License Agreement (including Software Licensing) is published here:
https://www.juniper.net/support/eula/

Juniper Network's current J-Care Maintenance Agreement is published here:

https://www.juniper.net/assets/de/de/local/pdf/service-descriptions/9060093-en.pdf

2.3 Product Background

2.3.1 Partnerships

Juniper Networks maintains Technology Alliances with the following Data Center, Compute and Storage organizations:

VMware, Panduit, EMC, Intel, Nutanix, Red Hat, Ubuntu, Ansible, Puppet Labs, and Opscode.

2.3.2 Industry Partners

Juniper Networks maintains Technology Alliances in the areas of Automation and Virtualization, Cloud and NFV Orchestration, Compute and Storage, HCI, Network Analytics, Physical Infrastructure, and VNF Technology. A complete list is available here:

https://www.juniper.net/us/en/partners/technology-alliances/data-center/

2.3.3 Consulting Partners

Juniper Networks leverages its Channel Partner network of partners to provide consulting services. Cadenza LLC maintains the highest available level of Juniper Partner status, Elite.

2.3.4 Market Position

Juniper Networks is positioned as a Data Center Leader in both the Gartner 2018 Data Center Magic Quadrant and the Forrester Q1 2018 Wave for Hardware Underlay for SDN.

2.3.5 Number of Installations in production

Juniper Networks maintains over 3,000 data center customers.

2.3.6 Approximate market share

Gartner, Inc estimates Juniper Networks accounted for 5% of total data center ports shipped in 2017.

2.3.7 Approximate market share last year

Gartner, Inc estimates Juniper Networks accounted for 5% of total data center ports shipped in 2017.

2.4 Product Maturity

2.4.1 How long has the product been available?

Platform	Release Date
QFX10008	March 2015
QFX5210	Feb 2018
QFX5200-48Y	Feb 2018
QFX5100-48S	October 2014
EX4300	July 2015
SRX4100	October 2016

2.4.2 Describe the history of the product's code base

Juniper Networks's Junos Operating System is the only network operating system providing a common interface across routing, switching, data center, optical, security, and cloud networking platforms. Junos releases are provided on a quarterly basis, four times a year. A Junos release is easily identified by the version (for instance "18.1") as being release in 2018 during the first quarter.

In addition to providing a standardized quarterly release cycle, Juniper's JTAC organization publishes "JTAC Recommended Software Versions". These releases are recommended by JTAC for customers requiring the highest levels of stability. This takes the guesswork out of picking a software version and expedites JTAC support. JTAC's recommendations are published here: https://kb.juniper.net/InfoCenter/index?page=content&id=kb21476

2.4.3 How many outstanding defects exist against the current version?

Outstanding software defects will vary by platform and code release. Additionally, this list will change as existing defects are continually being fixed and new features are being added to the code base. As part of Cadenza's proposed deployment process, the JTAC recommended code at the time of deployment will be scrubbed, tested, and performance documented prior to being placed into production.

Software defects (bugs) can be found per device per release by:

1. Select the desired platform and JTAC Recommended Software Version.

2. Select the Documentation Tab.
3. Under Software Documentation select, Release Notes.
4. Navigate to the "Known Issues" section.

2.4.4 Describe the strategic direction for the product line including any planned major enhancements? Include product roadmap for the duration of warranty and product life with life cycles of all equipment provided.

Cadenza LLC is happy to provide multi-year roadmaps for the EX, QFX, and SRX product lines once a non-disclosure agreement (NDA) has been executed between Juniper Networks and the City of Columbus.

2.4.5 Provide the product patch and upgrade frequency

As stated in 2.4.2, Junos is released on a quarterly schedule for all platforms. In addition to quarterly releases, Juniper Networks will release patch or new technology releases to address critical defects or speed new feature adoption.

2.4.6 Industry Awards, Articles, Third Party Evaluations

Gartner 2018: Juniper Networks Named Leader in Data Center

Forrester Wave: Hardware Platforms For Software-Defined Networks, Q1 2018: Juniper Networks Named Leader

2.4.7 Please attach a copy of any articles or third party evaluations of your product

Third Party Evaluation reports attached as PDF documents.

2.5 Dependencies on other technologies

2.5.1 Identify those products that are not included with your product but are required for normal operation and functionality (e.g. VMWare NSX, Dark Fiber Infrastructure, etc.)

Our solution will require two pairs of dark fiber at 102,383 feet -10.2 dB loss or better between each data center compatible with the 100G-ER4L standard.

Our solution will require VMware ESX, NSX, and vCenter licensing as required to build OVSDB / VXLAN overlays as requested by this RFP.

Our solution will require at least one NSX ESG to support termination of remote access VPN connections to replace the legacy ASA remote access connections.

Our solution will require 4 virtual machines to host the Junos Space Network Director, Security Director, and Cloud Analytics Engine appliations:

Primary Space Node: 4 vCPU, 32GB RAM, 200GB Disk, OVA

Secondary Space Node: 4 vCPU, 32GB RAM, 200GB Disk, OVA

Log Director Node: 4 vCPU, 32GB RAM, 500GB Disk, OVA

Cloud Analytics Engine (CAE): 2 vCPU, 8GB RAM, 200GB Disk, CentOS 6.5 or later

Our solution will require API access to vRealize, vCenter, and (depending on

deployment mode) CAE agents installed on ESXi hosts to provide automated underlay to overlay tracing.

2.5.2 Please indicate any technology that is bundled with your solution but is made by a third party

Our proposal only includes products from Juniper Networks. There are no third party products included in our proposal.

2.6 Third Party Offerors Integration

2.6.1 Indicate any offerors and their products that integrate or provide add-on functionality to your product

Cadenza LLC does not offer any commercial products that integrate with our proposal. We do routine use the open source Ansible automation framework to further enhance the efficiency of our solution.

2.6.2 OEM Relationships

Cadenza LLC does not currently OEM any third party products.

2.6.3 Indicate any offerors and the related product lines that are currently integrating your products into their solution offerings

None at this time.

2.7 Product Architecture Overview

Offeror should provide an architectural solution overview, including:

Please see the attached Technical Design Visio attached to our proposal.

2.7.1 A high-level network architecture/design description. This includes categorizing the architecture as traditional switching infrastructure, fabric, programmable fabric, SDN or SDN overlay.

Our high-level architecture is divided into three distinct technology areas:

Spine Leaf – Green Field: The Green Field portion of our proposal is based on the industry standard 3 Stage CLOS IP Fabric. Uplinks between data center leaves and spines are routed allowing all uplinks to be active, enable sub-second failover, and provide vendor interoperability with other switching vendors.

Spine Leaf – Brown Field: The Brown Field portion of the network will be deployed as a transitional layer 2 trunked design to facilitate maximum compatibility for legacy end hosts. MC-LAG will be leveraged to achieve a Spanning Tree Protocol (STP) free design, eliminate all single points of failure, and allow all switch uplinks to be active.

SDN Overlay: VMware NSX's OVSDB / VXLAN control plane will be deployed across both green and brown field areas of the network enabling DCI, security, and full SDN application services across all hypervisors. VMware NSX will be augmented by the Juniper QFX platforms native hardware VXLAN Tunnel Endpoint (VTEP) support, allowing physical hosts to seamlessly participate in the NSX VXLAN overlay. Juniper's SRX platform can optionally be integrated into NSX to augment NSX's native security to support a fully NGFW feature set of IPS, Web Filtering, and malware analysis. Finally, spine to spine VXLAN will be used during the transition to SDN to replace the City's legacy FabricPath

deployment.

2.7.2 A reference architecture on which the design is based. This should include references to documentation that is publicly available on the vendor's website.

The physical underlay portion of our proposal is based on Juniper's "Clos IP Fabrics with QFX5100 Switches" architecture. Note that QFX5200 switches are used in our proposal to provide the 25G/100G densities requested that are not available on first generation QFX5100s. The white paper for this underlay design is available here:

https://www.juniper.net/assets/us/en/local/pdf/whitepapers/2000565-en.pdf

The SDN overlay portion of our proposal is based on the VMware NSX Brown field Design and Deployment Guide 2018 available here: https://www.vmware.com/content/dam/digitalmarketing/vmware/en/pdf/whitepaper/products/nsx/vmware-nsx-brownfield-design-and-deployment-guide-white-paper.pdf.

We have also included both deployment guides in PDF format in our response.

2.7.3 Description of the network topology being proposed. This includes the topology type (e.g., Spine/Leaf CLOS, ring, full-mesh or 3-tier) and number of physical and virtual tiers.

The data center spine / leaf portion of our design is built as a classic 3 stage CLOS fabric. In line with VMware's NSX Deployment Best Practices, high density leaves will be deployed as pairs and connected via MC-LAG to provide ESXi hosts the ability to deploy LACP on all interfaces.

In its entirety, each data center is built as a loose 5 stage CLOS fabric. The data center is segmented into modular fault domains (spine/leaf, MAN, Internet, core) to reduce complexity, increase resiliency, and allow for easy expansion.

2.7.4 Identify whether the solution uses a top-of-rack (ToR), end-of-row (EoR) or alternative design.

Our solution as proposed can concurrently support both ToR and EoR style deployments. Our design assumes leaf switches will generally be deployed in pairs as ToR but may also be deployed in the middle of a row or EoR style for lower density areas of the data center. As our solution is based on open standards, the only limitations are physical port availability and forwarding table (routing, ARP, MAC, etc) scalability.

2.7.5 Identify the primary elements of the solution and whether they are physical, virtual or software-based (e.g., physical switches, virtual switches, controllers and software).

The primary elements of our proposal can be broken into underlay and overlay:

Underlay: Physical QFX switches running BGP, ECMP, and BFD to achieve a non-blocking IP fabric with sub-second failover. QFX switches integrated with NSX as hardware VTEPs to support bare metal end points. QFX 5210 spines leveraging VXLAN to replace legacy FabricPath DCI. MC-LAG leveraged to

support legacy 1G brownfield devices during the migration to NSX.

Overlay: NSX OVSDB / VXLAN for true software defined networking and programmability.

2.7.6 Description of the logical topology of the network being proposed. Vendor should clearly indicate where Layer 3 routing/switching is delineated from Layer 2 switching, as well as the protocols that are used at both Layer 3 and Layer 2.

Please refer to attached Visio detailing physical and logical topologies.

2.7.7 Description of the primary control plane protocols proposed and/or supported for the proposal (Spanning-Tree, TRILL, SPB, Layer 3 ECMP, SDN or a proprietary approach, etc.).

Our proposal is based on open standards protocols. Routing is accomplished with BGP, ECMP, and BFD. A simple VXLAN control plane is provisioned between the QFX5210 spine switches in each data center for DCI. MC-LAG is leveraged to provide a Spanning Tree free design for brown field devices.

The overlay control plane is completely run by NSX as a best practice NSX OVSDB / VXLAN control plane. Underlay QFXes can integrate with NSX as hardware VTEPs, however we are not recommending a full EVPN-VXLAN implementation in the underlay due to the operational complexity of running VXLAN overlay tunnels through VXLAN tunnels in the underlay. Our design adheres to VMware's best practice recommendations to keep the physical underlay networks as simple as possible and move control plane functions into NSX.

2.7.8 A high-level overview of the management capability of the proposed solution.

Junos Space Network Director with Cloud Analytics allows for full life cycle management of the underlay network but also supports flow mapping between underlay and overlay. Network Director provides the following as proposed:

Fabric automation
fully automates the provisioning, configuration, and deployment of complex underlay and virtualized fabric topologies, providing comprehensive pre- and
post-deployment support and management for Layer 2 and Layer 3 fabrics, as well as Junos Fusion Enterprise and Junos Fusion Data Center fabrics. Junos Fusion is a single-
tier architecture that allows an enterprise network to be managed as a single system.

•
Zero touch provisioning
(ZTP) simplifies the deployment of networks without requiring user intervention, providing policy-driven plug-and-play provisioning and network bring-up operations for both fabrics and individual devices.

•
Bulk provisioning
enables faster service rollout and activation while protecting against configuration errors with profile-based and pre-validated configurations. Bulk
operations can be performed at logical (access, aggregation, core) or location (site, building, floor, rack) levels.

•
Automated access port provisioning supports plug-and-play operations. Network Director detects the end point device types (such as wireless access points and VoIP
phones) that are plugged into ports and automatically provisions all port-related parameters including VLAN, 802.1x, and security policies to comply with port profiles.

Performance Analyze
r provides real-time and trended monitoring of tenants, hosts, VMs, fabrics, and ports, as well as high-

frequency monitoring that gathers valuable
performance data for tracking queue depth and heat-map visualization. Network Director analyzes the entire network, using heat-maps to identify over- and under-utilized ports, latency, and top VMs, users, devices, and ports.

•
Network Traffic Analyzer
proactively monitors network usage to find the sources of network traffic spikes. Incorporating an automated policy-driven sFlow collector and flow analysis, Network Traffic Analyzer quickly identifies and isolates users, applications and protocols consuming the most bandwidth.

•
Flow Path Analyzer
provides operational and diagnostic capabilities that trace connectivity between applications and flows by correlating network telemetry data with the application. Flow Path Analyzer visualizes network
paths between leaf and spine switches for a given flow/application, correlating congested ports with high-latency events and identifying impacted or unhealthy VMs, applications, and hosts.

•
Overlay and Underlay Analyzer
provides full visibility, performance management, and troubleshooting capabilities for physical and virtualized overlay networks in VMware Virtual Extensible LAN (VXLAN) and controller-less environments. It provides a consolidated and correlated
view of VMs, hosts, fabrics, and overlay and underlay networks with full end-to-end network and flow visibility and analysis.

•
VM Analyzer
provides real-time physical and virtual topology views, tracks vMotion activity including virtual machine creation, deletion, and moves, and maintains complete virtual network inventory.

•
Fabric Analyzer
monitors and analyzes the health of the entire network fabric, including IP Fabric, Virtual Chassis Fabric configurations, and Juniper Networks QFabric® System, increasing service availability.

2.7.9 A high-level summary of the key differentiating aspects of the vendor's solution versus other leading vendors.

Juniper Networks is uniquely positioned to bring the City of Columbus into the next chapter of technology adoption:

- Juniper Networks is the only manufacturer offering a single operating system (Junos) solution spanning data center, routing, switching, and security.
- Junos is the only platform to support both data center and security integration points with VMware.
- Junos's unique ability to safely pre-test configuration changes provides instant operational efficiency improvements to the City.
- Juniper Networks' s support of open standards is exemplified in our proposal. Our proposal is based on open standards. The City could elect at a future date to deploy non-Juniper data center network equipment and it would integrate seamlessly through industry standard BGP, BFD, and VXLAN.
- Juniper Networks' s SRX firewall platform is the only platform in the industry capable of support In Service Software Updates (ISSU) allowing code upgrades for security patches or maintenance to be performed without downtime.

2.7.10 The number, type and speed of physical interfaces included in the proposal. Specify whether the interfaces support multiple speeds (1G/10G/25G/40G/50G/100G) and what the process is to convert a port between speeds (e.g., if a switch reboot is required).

A reboot is not required to convert ports between different speeds where supported by the platform. Below is a summary of the port speeds included in our proposal:

Platform	Interface Support as Proposed
QFX10008	60 x 1G/10G, 6 x 40G, 30 x 100G. 6 x 40G ports can be converted to 2 x 100G.
QFX5210	64 x 40/100G ports. 40/100G port can use 4 x 10G or 4 x 25G break out cables.
QFX5200-48Y	48 x 10G/25G ports. 6 x 40/100G ports.
QFX5100-48S	48 x 1/10G SFP+, 6 x 40G. 40G ports can use 4 x 10G break out cables.
EX4300	48 x 1G Copper, 4 x 40G QSFP, 4 x 1/10G SFP+ with expansion module
SRX4100	8 x 1/10G SFP+

2.7.11 Specify physical form-factor of devices required (chassis, stackable, appliances, etc.). Identify which "if any" of these network devices can optionally be delivered via software or virtual machine versus proprietary hardware (e.g., virtual editions or virtual network functions).

Platform	Form Factor
QFX10008	Chassis - supports dual routing engines and up to 8 modular line cards.
QFX5210	Fixed 2U form factor.
QFX5200-48Y	Fixed 1U form factor.
QFX5100-48S	Fixed 1U form factor. Capable of stacking up to 10 over distances of 80km.
EX4300	Fixed 1U form factor. Capable of stacking up to 10 over distances of 80km.
SRX4100	Fixed 1U form factor.
Network Director	Vmware ESXi compatible OVA
Security Director	Vmware ESXi compatible OVA
Cloud Analytics Engine	Linux application package compatible on CentOS 6.5+

Juniper Networks has the vQFX platform to allow lab testing and simulation of QFX switches in a virtual environment. Juniper Networks also has the vSRX virtual version of the SRX platform that scales from 10mbps – 100gbps and can run on VMware ESXi, KVM, AWS, and Azure as well as natively integrates with VMware NSX.

2.7.12 Identify the hypervisors that are supported.

Network Director and Security Director require VMware ESXi or Linux KVM.

2.7.13 Describe how growth is accounted for and identify additional access interface capacity included in the proposal (e.g., for devices such as servers to plug in).

Used vs. available port counts are indicated on the Physical Topology Visio

included as an attachment in our proposal.

2.7.14 Describe how growth is accounted for in the overall system design (e.g., scale-out versus scale-up) and how many network nodes can be added before new devices or modules must be added.

Used vs. available port counts are indicated on the Visio diagram included as an attachment to our proposal. The following two platforms in this proposal can be expanded via field installable modules:

QFX10008: As proposed 2 slots in use with 6 slots available.

EX4300-48T: As proposed, 1G Copper leaf EX4300-48T switches can support a 4 x 1/10G SFP+ module.

2.7.15 Include data specification sheets for each class of hardware included in the proposal (as an appendix).

We have included hyperlinks to the publicly available data sheets for all hardware platforms at the end of this section.

2.7.16 Specify the degree of redundancy for the individual device components (power supplies, fans, supervisors, etc.).

All devices in our proposal have dual power supplies and fans. Additionally the QFX10008 platform is equipped with dual routing engines.

2.7.17 Specify the switching fabric capacity and the forwarding capacity of the individual network devices proposed (e.g., whether they are line-rate or oversubscribed) and of the overall topology proposed in the solution.

Platform	Physical Specifications
QFX10008	Non-blocking, 7.2 tbps per slot
QFX5210	Non-blocking, 12.8 tbps backplane
QFX5200-48Y	Non-blocking, 1.8 tbps backplane
QFX5100-48S	Non-blocking, 1.44 tbps backplane
EX4300	Non-blocking, 320 gbps backplane

Please see our attached Visio for topology details.

2.7.18 Specify whether the devices proposed use a centralized, decentralized or hybrid forwarding plane. Identify which major functions and operations are performed in hardware versus software.

Control plane functions (routing and switching protocols) are computed in software on the routing engine and then programmed into the hardware ASIC of the dataplane.

2.7.19 Specify the interface packet buffers and the degree to which they are shared or dedicated.

Platform	Buffering
QFX10008	Juniper developed Q5 ASIC with HCM Memory. Up to 100msec of buffering per port

QFX5210	Shared Buffer, 42M
QFX5200-48Y	Shared Buffer, 22M
QFX5100-48S	Shared Buffer, 12M
EX4300	Shared Buffer, 12M

2.7.20 Specify the key physical operating characteristics of the device models proposed, including size, height, weight, airflow, power consumption, operating temperature and overall mean time between failure (MTBF) of the entire device.

Juniper does not publicly publish MTBF numbers.

Platform	Physical Specifications
QFX10008	13U, 17.4 x 22.55 x 32 in, 6 x 2700W AC power supplies
QFX5210	2U, 17.26 x 3.45 x 24.1 in, dual 850W AC power supplies
QFX5200-48Y	1U, 17.36 x 1.70 x 20.28 in, dual 650W AC power supplies
QFX5100-48S	1U, .72 x17.36 x 20.48 in, dual 650W AC power supplies
EX4300	1U, .41 x 1.72 x 16.43 in, dual 350W AC power supplies
SRX4100	1U, 17.48 x 1.7.x.25 in , dual 650W AC power supplies

2.7.21 Specify the expandability of the devices — are they modular or upgradable from an interface and/or fabric perspective.

All devices in this proposal are fixed with the exception of the EX4300 which can support an optional 4 x 1/10G SFP+ module and the QFX10008 which has 8 modular slots for line cards.

2.7.22 Describe the cabling supported and required for the devices (e.g., copper, Fiber) and any transceivers required.

Please reference our included Visio for cable types in use and our BOM in the pricing spreadsheet for exact optic specifications proposed.

2.7.23 Identify port-to-port latency between for individual devices (intra switch latency) and within the physical data center solution proposed (i.e., best- and worst-case server to server latency within the proposed solution).

Best case latency scenario is two ports on the same module of a QFX10008 (2.5 microseconds). Worst case latency would be from a brown field EX4300 leaf -> QFX5210 spine -> QFX10008 core -> SRX4100 firewall -> EX4300 DMZ switch would could be up to 2ms depending on what security services were enabled.

2.7.24 Describe the CPU and memory of the devices, if not provided in the specifications literature.

These are published in the platform datasheets (links included in our response) however Juniper generally favors a Routing Engine built on a multi-core Intel CPU.

2.7.25 Describe any “green” initiatives or solutions included in the proposal.

Juniper Networks complies with the following environment initiatives:
Restriction of Hazardous Substances (ROHS) 6/6
China Restriction of Hazardous Substances (ROHS)

Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)
Waste Electronics and Electrical Equipment (WEEE)
Recycled material
80 Plus Silver PSU Efficiency

2.7.26 Describe any differentiating or highly innovative hardware capabilities compared with leading competitors.

Juniper Networks is uniquely positioned to bring the City of Columbus into the next chapter of technology adoption:

- Juniper Networks is the only manufacturer offering a single operating system (Junos) solution spanning data center, routing, switching, and security.
- Junos is the only platform to support both data center and security integration points with VMware.
- Junos's unique ability to safely pre-test configuration changes provides instant operational efficiency improvements to the City.
- Juniper Networks' s support of open standards is exemplified in our proposal. Our proposal is based on open standards. The City could elect at a future date to deploy non-Juniper data center network equipment and it would integrate seamlessly through industry standard BGP, BFD, and VXLAN.
- Juniper Networks' s SRX firewall platform is the only platform in the industry capable of support In Service Software Updates (ISSU) allowing code upgrades for security patches or maintenance to be performed without downtime.

2.7.27 Describe the capabilities of the management system, including the major functions provided (e.g., network fault management, network performance, monitoring and diagnostics, and network automation).

Please reference our earlier response covering Junos Space Network Director and Security Director.

2.7.28 Describe the supported methods for integrating with virtualization software and cloud management platforms (standardized protocols, scripting tools and/or APIs, etc.).

Juniper provides native API integrations for both data center switching and security with VMware's NSX and vCenter platforms. From a standards perspective NETCONF is universally supported on Junos while REST is also supported on the QFX family.

2.7.29 Describe how access and authentication to the NMS is achieved, and is there integration with Active Directory or LDAP services?

The Junos Space Platform supports Active Directory and LDAP for single sign on.

2.7.30 What are the options to achieve network segmentation (e.g., VRF, VLANs, VXLAN)?

The QFX family as configured supports VRFs, VLANs, VXLAN, as well as routing instances.

2.7.31 Describe how your solution can be integrated into an existing SPLUNK logging solution and include the log formatting options.

All Junos devices support standards SYSLOG, structured SYSLOG, and binary logging formats. Juniper Networks also maintains a Juniper app for Splunk to enable out of the box dashboards and reports.

2.7.32 Describe the procedures for software updates and upgrades; detail what, if any, costs would be associated with upgrades.

All software upgrades are included at no cost to the City for five years as part of our proposal. All devices will be configured with Graceful Routing Engine Restart (GRES) and Nonstop Forwarding (NSF). These technologies allow the control plane to restart while the data plane continues forwarding traffic. These features are enable in the configuration file and the automatically invoked during a normal code upgrade process. The code upgrade process itself consists of copying a single binary image file to the target devices and schedule it for upgrade.

Additionally the SRX4200 in our proposal supports In Service Software Update (ISSU).

2.7.33 Describe overlay/underlay integration that is available, including VTEPs and associated management.

OVSDB / Hardware VTEP is fully supported on all QFX hardware in our proposal. This can be managed from the CLI or from Network Director.

2.7.34 Describe hardware/software integrations that are supported and certified.

Juniper and VMware have co-authored and certified data center switching and security integrations between Network Director, Security Director, QFX, NSX, and vCenter.

2.7.35 Describe the specifics of the integration with VMware Virtualization.

Please see our response to 2.7.34.

2.7.36 Describe your product's support to achieve high availability

Juniper relies on a combination of industry standard techniques like GRES and NSF minimize or eliminate downtime. For platforms such as the SRX4200 or QFX10008 this is further minimized through the use of redundant routing engines in hardware or software.

2.7.37 Specify the number of route entries supported,maximum routed throughput IPv4 & IPv6, and if forwarding occurs in hardware versus software.

Routing tables are computed in software and then downloaded to hardware ASICs for traffic forwarding.

Platform	**Routing Scalability**

QFX10008	IPv4 2,000,000 / IPv6 2,000,000
QFX5210	IPv4 262,140 / IPv6 172,016
QFX5200-48Y	IPv4 128,000 / IPv6 98,000
QFX5100-48S	IPv4 128,000 / IPv6 64,000
EX4300	N/A Not being used for routing.

2.7.38 Discuss any known limitations of the product

All the equipment in our proposal is currently shipping and has a stable JTAC Recommended code release. We are not aware of any limitations as it would impact the City's technical requirements.

2.7.39 Please list all blocked or inactive links in your proposed design and explain?

Our design has no blocked or inactive links.

2.8 System Monitoring and Management

2.8.1 Please describe your systems management approach including the console and what can be monitored

Junos exposes all system internals including CPU, memory, disk, high CPU watermarks, microbursts, and packet loss via SNMP and API. These are automatically correlated by the Cloud Analytics Engine to enable rapid root cause analysis of network and application events. While all devices in our proposal have a physical console port, the console port is not required from a monitoring perspective.

2.8.2 What enterprise management standards do you support (e.g. SNMP, API)?

SNMP v2C, v3. API: NETCONF on all Junos platforms. NETCONF and REST on QFX platforms.

2.8.3 How are errors such as hardware failures or software failures handled by the system?

Junos Space Service Now Service Insight can proactively diagnose failing hardware and open JTAC cases on the device's behalf. In the event a device is simply hard down, Space will send alerts for log, email, or SNMP to the configured address(es).

2.9 Consulting Services

2.9.1 Describe the types of consulting services that your company offers

Please reference our response in section 3.4 of Appendix B.

2.9.2 Describe the types of consulting services offered by your consulting partners
Currently Cadenza does not partner or subcontract any consulting services. All services in this proposal are quoted to be delivered by Cadenza employees.

2.9.3 Please describe your engagement methodology, typical milestones, and standard deliverables

Please reference our attached project plan and response in section 3.4 of Appendix B.

2.9.4 Provide a definition for a small, medium, and large consulting engagement and indicate the length of each and the number of consultants typically engaged?

Small: > 400. 1 consultant.

Medium: 400-1000 hours: Typically, 1 – 2 consultants.

Large: 3,000+ hours. Typically, 3 consultants engaged over the course of 12-18 months.

2.10 Support

2.10.1 Describe the local technical support options available and the related cost structure

Cadenza LLC is located in Columbus, Ohio with 4 technical resources within less than 30 minutes from the City's data centers. Cadenza provides consultative support, design, and engineering on an hourly or fixed scope basis per a client's unique requirements.

2.10.2 Do you have any local technical support resources?

Yes – we have four local technical support resources.

2.10.3 Describe how the City will obtain direct access to the offeror's standard Tier-II or Tier-III resources when needed.

The City is free to engage Cadenza on an ad-hoc basis by simply calling into our office at 614-495-9300 or emailing us at contact@cadenzallc.com. While we make every effort to be responsive, we cannot always guarantee that a technical resource will be available on less than 72 hour notice.

Cadenza does also offer SLA back support services with strictly defined response times.

2.10.4 Describe offeror's helpdesk availability during normal and extended business hours, and whether the City's Staff will have access to dedicated offeror support resources when the offeror's helpdesk is closed, and network or implementation related incidents occur.

During all critical change activities of this engagement, the City will be supported directly by the Cadenza project team. At the conclusion of this engagement the City may contract with Cadenza for additional support services (ad-hoc or SLA backed) if it desires.

2.11 Training

2.11.1 Please describe your training offerings – including course descriptions, locations, and costs

Please reference our response in section 3.4 of Appendix B.

2.11.2 Is any 3rd party training available?

Juniper Networks provides the JumpStart Junos training program free of charge. The program can be access here https://www.juniper.net/us/en/dm/jump-start-junos-webinars/ and covers over 50 hours of remote training ranging from Fundamentals to Advanced topics.

2.11.3 Please describe the training typically required for users, developers, administrators, and technical support personnel.
Typical training when new to Juniper Networks are guided hands on learning session a we have included with our proposal. Experienced network engineers will typically pick up the new operating system within 2 – 3 week or part time work with it.

2.12 Data Center Facilities

2.13.1 Provide the physical dimensions of the proposed equipment and/or the Rackspace required to house the equipment for all sites.

Platform	Physical Specifications
QFX10008	13U, 17.4 x 22.55 x 32 in, 6 x 2700W AC power supplies
QFX5210	2U, 17.26 x 3.45 x 24.1 in, dual 850W AC power supplies
QFX5200-48Y	1U, 17.36 x 1.70 x 20.28 in, dual 650W AC power supplies
QFX5100-48S	1U, .72 x17.36 x 20.48 in, dual 650W AC power supplies
EX4300	1U, .41 x 1.72 x 16.43 in, dual 350W AC power supplies
SRX4100	1U, 17.48 x 1.7.x.25 in , dual 650W AC power supplies

2.13.2 Provide all power requirements, including any special conditioning or grounding requirements.

QFX10008 AC power supplies require 16A circuit. Power cords are modular and can support NEMA 6-20, NEMA L6-20P, or C19-C20 style connections.

All other equipment support NEMA 5-15 C13-14 style connections.

2.13.3 Provide all equipment Airflow directions and BTU outputs.

Platform	BTU / Cooling
QFX10008	Maximum BTU: 48,156 BTU/hr. Port side cool air intake.
QFX5210	Maximum BTU: 3,276 BTU/hr. Port side cool air intake.
QFX5200-48Y	Maximum BTU: 1,467 BTU/hr. Port side cool air intake.
QFX5100-48S	Maximum BTU: 2,218 BTU/hr. Port side cool air intake.
EX4300	Maximum BTU: 1,200 BTU/hr. Port side cool air intake.
SRX4100	Maximum BTU: 685 BTU/hr. Port side cool air intake.

2.13.4 Provide a list of any new equipment that does not have dual power supplies (100-250VAC) and dual fans

All devices in our proposal are equipment with dual power supplies and dual fans

that are field replaceable.

2.13.5 Provide a complete list of all supported transceiver types for all equipment in your proposal

Supported transceiver types can be found in the platform datasheets listed in the appendix at the end of this section.

Appendix: Datasheets:

Platform	Datasheet
QFX10008	https://www.juniper.net/assets/us/en/local/pdf/datasheets/1000529-en.pdf
QFX5210	https://www.juniper.net/assets/us/en/local/pdf/datasheets/1000633-en.pdf
QFX5200-48Y	https://www.juniper.net/assets/us/en/local/pdf/datasheets/1000560-en.pdf
QFX5100-48S	https://www.juniper.net/assets/us/en/local/pdf/datasheets/1000480-en.pdf
EX4300	https://www.juniper.net/assets/us/en/local/pdf/datasheets/1000467-en.pdf
SRX4100	https://www.juniper.net/assets/uk/en/local/pdf/datasheets/1000600-en.pdf
Network Director	https://www.juniper.net/assets/us/en/local/pdf/datasheets/1000428-en.pdf
Security Director	https://www.juniper.net/assets/us/en/local/pdf/datasheets/1000332-en.pdf
Cloud Analytics Engine	https://www.juniper.net/assets/us/en/local/pdf/datasheets/1000528-en.pdf