

Report: Root Certificate Authority Procurement Process

Prepared by NENA Staff
For the NG9-1-1 Interoperability Oversight Commission (NIOC)
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Document Purpose

This document provides an overview of the selection process for awarding a contract to operate the root certificate authority for the NG9-1-1 Public Key Infrastructure (PKI). No proprietary or competitive information has been included in this document.

Background

The i3 NGCS standard¹ includes in its security architecture a root of trust called the PCA, or PSAP Credentialing Agency (originally “PSAP Certificate Authority”), which is the root certificate authority for a PKI envisioned for NG9-1-1. An RFP was developed with support from NENA Development Group (NDG) membership originally dated August 2016 to contract with a third-party vendor to operate this certificate authority. NENA staff updated and published the RFP on June 10, 2019 and conducted a sealed, competitive bid and assembled an RFP review panel from NDG to review responses and make a recommendation to award to one of the proposers.

NIOC approved of the award on April 15, 2020, directing NENA and NIOC’s treasurer to negotiate a contract with DigiCert. NIOC approved of the Master Services Agreement (MSA) on July 8, 2020, and the NENA board agreed to enter into contract on July 17, 2020.

Methodology

NENA staff established a selection panel to assist with review of proposals. Members were taken from volunteers within NDG and represented interests in both public and private employment and active contributors to the i3 standard that had no material conflict of interest with the subject of the RFP. Though the panel came to a decision within a couple of months and notified the incumbent vendor of their apparent award, NENA did not make a formal contract award until NIOC could begin meeting and approve of the award and selection process. Panelists included the following individuals:

- Brandon Abley, NENA
- Steve McMurrer, Fairfax County, Virginia

¹ See NENA STA-010 at https://www.nena.org/page/i3_Stage3

- Jerry Eisner, Red Sky Technologies
- Guy Caron, Bell Canada²

The review panel included four individuals that reviewed and scored proposals. Each reviewer reviewed proposals independently and awarded a total of 40 points in each of the following four areas:

- Technical Quality (10 points)
- Prior Experience (10 points)
- Quality of Processes (10 points)
- Ability to establish Certificate Authorities (CAs) under root (10 points)

The panel shared notes and met several times to discuss findings. The panel also executed a formal Question and Answer with candidate vendors to clarify aspects of their proposals.

Panelists were not allowed to see pricing information until scores were final so as not to bias their review of the proposals themselves; a total of 20 points were withheld to be assigned on the basis of cost. Once scores were finalized, cost was evaluated, and a final score was awarded to each of the candidate vendors. Scores were not allowed to be adjusted after pricing was revealed.

Scores (without attribution) per reviewer are in the table below.

Table 1: Review Scores for PCA RFP

Reviewer 1	Technical Quality	Prior Experience	Quality of Processes	Ability to Establish CAs under Root
Vendor A	10	10	9	9
Vendor B	9	8	8	7
Vendor C	7	6	6	9
Reviewer 2				
Vendor A	8	8	6	5
Vendor B	7	6	5	4
Vendor C	8	5	7	7
Reviewer 3				
Vendor A	9	9	8	8
Vendor B	7	7	6	9
Vendor C	7	8	7	7
Reviewer 4				
Vendor A	9	10	8	10
Vendor B	6	5	7	5
Vendor C	8	9	9	10

² Participation in the RFP process is as a NENA volunteer expert and should neither be construed as an endorsement of the USA PCA by Bell Canada nor inferring its adoption in Canada.

The selected vendor was found to have the best technical scores overall. The review panel had strong confidence in their proposal and significant experience operating CAs and PKIs, even though the selected vendor did not have as much public safety or 9-1-1 experience as the other two. Ultimately, the panel felt that PKI experience and stability as a CA trumped public safety experience. The selected vendor was by far the most established among all candidates, being one of the world’s largest and most established commercial CAs, leaving the panel confident that the selected vendor could handle the scale and mission-criticality of operating the root CA for the NG9-1-1 PKI.

Cost

Cost proposals were to be based on one-time startup costs, annual operating costs billed to NIOC/NENA and incremental costs to implement issuing certificate authorities with 5-year validity periods. Vendors were to assume 100-200 issuing certificate authorities (e.g., approximately one per ESInet). Though the RFP requested that proposers include a business model, program income to NIOC/NENA was not considered a positive scoring factor in reviews; reviewers assigned value based only on the total cost of the program.

The review panel found that the selected vendor not only had the best technical proposal, but the lowest price, both in terms of both the cost to establish and operate a root certificate authority but also in terms of cost to credential an issuing certificate authority. Furthermore, the selected vendor offered the lowest risk, assessing no annual fees back to the NIOC/NENA to operate the PKI, with all costs included in certificate issuance. The other two vendors had higher startup costs, higher annual costs to NIOC/NENA and higher costs to establish a five-year ICA.

The vendor offering the best cost was awarded the full 20 points for the cost category, and the other vendors were awarded proportional costs based on the following formula:

$$(\text{best score} / \text{score } n) * 20$$

Scores (without attribution) for cost category are in the table below:

Table 2: Scoring by Price by Vendor for PCA RFP

Total Scores	Price (Fixed Only)	Price (5 years)
Vendor A	20	20
Vendor B	11.17	0.97
Vendor C	5.41	0.8

The fee schedule for the production PKI shall be available at <https://ng911ioc.org/finances>.

Award

NIOC approved of the contract award to DigiCert on April 15, 2020, determining that the RFP process was handled fairly and appropriately, and that a provider was selected that provides the best value for NG9-1-1. This NIOC approval compels NENA staff to enter into contract negotiations with the selected vendor. The MSA, which contains provisions for creating and maintaining a root certificate and establishes a formal contract relationship with the selected vendor, was approved by NIOC on July 8, 2020.

NENA functions as NIOC's legal entity under oversight direction from NIOC, as NIOC cannot enter into contracts on its own. However, NENA requires NENA board approval to enter into large contracts. Accordingly, staff brought this selection to the duly elected NENA board, who affirmed the selection and approved entering into contract on July 15, 2020.

Next Steps

While creation of the root certificate is a significant milestone, it is the first step of many prior to going to production with the NG9-1-1 PKI. In addition to the MSA, the following must be completed prior to the issuance of the first end-entity certificate in the PKI:

- The Certificate Policy for all Certificate Authorities in the PKI
- The Validation Policy for approving entry to the PKI (such as issuing certificates)
- Fee schedules for securing certificates in the PKI
- A Certificate Practice Statement for each entity proposing to operate an issuing Certificate Authority