NIST Requirements Document

Polatis Series 6000 Ultra Secure grade Switches: 16x16 and 8x8

I. Introduction/Background:

The NIST Quantum Information Group applies expertise in mathematical subdisciplines such as combinatorics, graph theory, network science, operations research, optimization, discrete nonlinear dynamics, computational geometry, quantum mechanics, and information theory. Researchers apply their knowledge and skills in areas such as the fundamental models of physics, chemistry, biology, and information systems, complex systems analysis, pattern recognition, and quantum computing and communications. In collaboration with NIST and outside scientists, the group develops, analyzes, and applies related mathematical methods and tools for critical problems of measurement science at NIST, and develops mathematical foundations for the measurement science of information systems. As part of this mission, our group is planning to develop new schemes and protocols for quantum networking and is planning to perform experiments to test these protocols in the newly developed NIST campus network (called NG-QNet) and a regional quantum network (called DC-QNet).

II. Purpose:

The purpose of this acquisition is to obtain a Polatis Series 6000 Ultra Secure grade All-Optical Switches, manufactured by Huber+Suhner. The switches will be used to route single and entangled photons around a quantum network testbed on the NIST campus and across the DC-region. The switch will be integrated into the existing infrastructure of the QN testbed at NIST and the infrastructure across the region. The network uses Polatis switches to manage the routing of quantum signals and a unique, NIST built Quantum Network Control Plane has been especially developed to manage this process. This control plane is written specifically for Polatis switches. For this reason, we require a BRAND NAME ONLY switch (manufacturer part number Polatis S-OST-08x08-LA1-HMHNS and S-OST-16x16-LA1-HMWNS) – although we do not specify the source from which this item can be purchased.

III. Minimum Requirements:

The Contractor shall provide a system that meets or exceed the salient characteristics identified below. **All items must be new. Used or remanufactured equipment will not be considered for award. Experimental, prototype, or custom items will not be considered. The use of "gray market" components not authorized for sale in the U.S. by the proposer is not acceptable.** All line items shall be shipped in the original manufacturer's packaging and include all original documentation and software, when applicable.

> The Contractor shall provide a Firm Fixed Price Quotation for the following CLINS.
> Contract Line Item 0001: Polatis S-OST-08x08-LA1-HMHNS Optical Switch, quantity one (1).
> Contract Line Item 0002: Polatis S-OST-16x16-LA1-HMWNS Optical Switch, quantity one (1).

This must be in accordance with the specification requirements identified in the following:

Part Number	Quantity	Description
S-OST-16x16-LA1-HMWNS	1	Polatis Series 6000 Ultra Secure grade 16x16 Switch
S-OST-08x08-LA1-HMHNS	1	Polatis Series 6000 Ultra Secure grade 8x8 Switch

EACH switch shall be a Polatis Series 6000 Ultra Secure grade Switch meeting the following specifications:

- SMF28 Optical Matrix Switch configured in a 1U high Rack-mount Tray
- 16x16 switch: 16 Input ports and 16 Output ports,
- 8x8 switch: 8 Input ports and 8 Output ports,
- LC/APC connectors
- Hot Swap Twin Gigabit Ethernet & serial comms
- Multiprotocol (TL1,SNMP,SCPI,SDN) & secure web GUI control interface
- Hot swap dual 100/240VAC power
- Firmware updates included.

IV. Delivery:

Delivery shall be FOB destination and shall occur within 75 days after contractor receipt of order. FOB Destination means: The contractor shall pack and mark the shipment in conformance with carrier requirements, deliver the shipment in good order and condition to the point of delivery specified in the purchase order, be responsible for any loss of and/or damage to the goods occurring before receipt and acceptance of the shipment by the consignee at the delivery point specified in the purchase order; and pay all charges to the specified point of delivery. The contractor shall deliver all Line Items to:

Delivery shall be made to the NIST Shipping and Receiving address identified below. The delivery will then be directed to the equipment's final destination, also identified below.

National Institute of Standards and Technology
Shipping & Receiving
100 Bureau Drive

Building 301
Gaithersburg, MD 20899-0001

NIST Final Equipment Destination
100 Bureau Drive
Building 220
Gaithersburg, MD 20899-1640

V. Inspection and Acceptance:

In addition to the inspection and acceptance terms articulated in 52.212-4, the Government reserves the right to perform such performance tests and evaluations as defined below to verify specified system performance. Such tests and evaluations, if performed, shall be conducted within the environment that the system is to be operated. The Contractor has the right to be present during the tests and evaluations, if performed, at the Contractor's expense.

The scope of general inspection included:

- Structural, mechanical, and electrical evaluation of product
- An operational evaluation of the fiber attenuator
- Evaluation of the system's performance and software interfacing

A visual inspection of the fiber attenuator will be performed by the NIST TPOC to identify defects or any form of indication that the fiber attenuator was damaged during transport to NIST. The Government shall have sole discretion to require repair or replacement of damaged and/or nonconforming supplies at no cost to the Government. The Government at any time prior to acceptance shall reject the fiber attenuator due to defects and/or nonconformance.

The vendor is responsible for latent defects discovered any time after final inspection. However, the extent of its liability shall be prorated over the useful life of the fiber attenuator.

The place of acceptance shall be:

100 Bureau Drive
Building 220
Gaithersburg, MD 20899

Ownership (title) of the fiber attenuator shall transfer to NIST upon acceptance.

The Government will test, inspect, and accept or reject the equipment within (30 working days) of the receipt of the equipment unless otherwise indicated above. The

Government reserves the right to conduct quality assurance testing to confirm that a given instrument(s) meets the manufacturer's and/or the Government's performance specifications. It is anticipated that the equipment will meet all manufacturer's specifications and/or the Government's performance specifications identified in the most recent operations and maintenance manual for each piece of equipment and/or in this document.

VI. Warranty

The contractor shall warrant the entire system in accordance with the Original Equipment Manufacturer's commercial item warranty terms and conditions, to include at minimum parts and labor for 12 months. Warranty shall commence upon acceptance of the system by the Government.

VII. Payment Schedule

Advance payment is not authorized. The Contractor shall be paid, in accordance with Net 30-day payment terms, upon receipt and acceptance of a proper invoice, in accordance with the following schedule:

1. 100% after receipt and acceptance of fully delivered system by the Contracting Officer Representative (COR).

   NOTE: Partial shipments and partial invoices will not be accepted, unless other-wise requested and accepted by the Contracting Officer prior to award offer. Proposed payment schedules shall be submitted with vendor's response to the RFQ for consideration.