



ASTI – FM 03-17  
REV 2 / 31 January 2020

**PURCHASE ORDER**

<b>Supplier:</b>	<b>Microdata Systems Management, Inc.</b>	<b>PO No.:</b>	<b>21-09-166</b>
<b>Address:</b>	<b>199 CM Recto Cor. A. Mabini St., Brgy. Addition Hills, San Juan City</b>	<b>PO Date:</b>	<b>September 28, 2021</b>
<b>TIN:</b>	<b>000-132-948-000</b>	<b>Mode of Procurement:</b>	<b>Competitive Bidding</b>

Gentleman:

Please furnish this Office the following articles subject to the terms and conditions contained herein:

<b>Place of Delivery:</b>	<b>ASTI Bldg., C.P. Garcia Ave., U.P. Technology Park Complex, U.P. Campus, Diliman, Quezon City 1101</b>	<b>Delivery Term:</b>	<b>Sixty (60) Calendar Days upon issuance of NTP</b>
<b>Date of Delivery:</b>		<b>Payment Term:</b>	<b>Government Terms</b>
		<b>Warranty Term:</b>	

Stock / Property No.	Unit	Description	Quantity	Unit Cost	Amount
1	Lot	<p><b>Network Equipment (ie. line cards, cpe/edge routers, network switch, network server, and UPS batteries)</b></p> <p>I. Supply and Delivery of Network Equipment The specifications written herein are of minimum requirements, unless otherwise stated.</p> <p>1. Switches</p> <p>1.1. Two (2) Units Switch</p> <p>1.1.1. Ports: 64x 100G QSFP28 1.1.2. CPU: Quad-core processor, 1.5GHz 1.1.3. Switching Capacity: 12.8 Tbps 1.1.4. Forwarding Rate: 9.52 Bpps 1.1.5. SDRAM: 4GB 1.1.6. Flash Memory: 8GB 1.1.7. Packet Buffer: 42MB 1.1.8. Hot-swappable AC Power Supplies: 2 (1+1 Redundancy) 1.1.9. Hot-swappable Fans: 3 (2+1 Redundancy), Front-to-Back 1.1.10. Dimensions (HxWxD): 3.46"x 17.4"x 17.7" (88x 442x 450mm) 1.1.11. Switch Chip: BCM56970 1.1.12. Number of VLANs: 4000 1.1.13. MAC Address: 72000 1.1.14. Jumbo Frame: 9216 1.1.15. ARP Entries: 90000 1.1.16. Latency: &lt;1µs 1.1.17. Max. Power Consumption: &lt;600W 1.1.18. Layer Type: Layer 3 1.1.19. MTBF: 390,000 Hours 1.1.20. Warranty: 3 Years 1.1.21. Support line-rate IPv4/IPv6 dual-stack multi-layer switching 1.1.22. Support IPv4 router protocol static routing 1.1.23. Support RIP, OSPFv2, IS-ISv4, BGP4, RIPng, OSPFv3, ISISv6, and BGP4+ 1.1.24. Supports IPv6 addressing, ICMPv6, Path MTU Discovery</p>	1	<b>P19,336,681.00</b>	<b>P19,336,681.00</b>

Postal Address : ASTI Bldg., U.P. Technology Park Complex,  
CP Garcia Ave., Diliman, Quezon City 1101  
Website : www.asti.dost.gov.ph  
Email : info@asti.dost.gov.ph

Tel No. : +632 8249-8500  
+632 8426-9755;  
Fax No. : +632 8426-9764

1.1.25. Support 2 units stacking simplified network topology

1.1.26. Support 50-200ms link failure fast recovery

1.1.27. Support PFC, ECN, DCBX

1.1.28. Realized lossless Ethernet low-latency forwarding based on RDMA (Remote Direct Memory Access)

1.1.29. Support the Spanning Tree Protocols (IEEE802.1d STP, IEEE802.1w RSTP, standard 802.1s MSTP)

1.1.30. Support Virtual Router Redundancy Protocol (VRRP)

1.1.31. Support Rapid Link Detection Protocol (RLDP)

1.1.32. Support Rapid Ethernet Uplink Protection Protocol (REUP)

1.1.33. Support the IPv4 and IPv6 multicast functions

1.1.34. Support IGMP snooping, IGMP, MLD, PIM, MSDP

1.1.35. Support IGMP source port and source IP check function

1.1.36. Support hardware-based IPv6 ACLs

1.1.37. Support hardware CPU protection mechanism

1.1.38. Support DHCP snooping

1.1.39. Support the source IP-based Telnet device access control

1.1.40. Support the Secure Shell (SSH) and SNMPv3

1.1.41. Support Network Foundation Protection Policy (NFPP)

1.1.42. Support SNMP (SNMPv1,v2c,v3), RMON, GRPC, OAM and Syslog

1.1.43. Support Telnet, SSHv1/v2

1.2. Twelve (12) Units Switch

1.2.1. Ports: 48x 10G SFP+, 2x 40G QSFP+, 4x 100G QSFP28

1.2.2. Switching Capacity: 1.92 Tbps

1.2.3. Forwarding Rate: 1071.4 Mpps

1.2.4. RAM: 1GB

1.2.5. Flash Memory: 2GB

1.2.6. Max./Min. Latency: 6.35us/6us

1.2.7. Packet Buffer: 9MB

1.2.8. Hot-swappable Power Supplies: 2 (1+1 Redundancy)

1.2.9. Hot-swappable Fans: 4 (3+1 Redundancy)

1.2.10. Airflow: Front-to-Back

1.2.11. Total Number Of IPv4/IPv6 Routes: 8K

1.2.12. MAC Address: 65K

1.2.13. ARP Table: 4096

1.2.14. Input Voltage: 100-240VAC, 50-60Hz

1.2.15. Typical/Max. Power Consumption: 160W/200W

1.2.16. Rack Space: 1U

1.2.17. Dimensions (HxWxD): 1.72"x17.32"x18.5" (43.6x440x470mm)

1.2.18. Operating Temperature: 32°F to 113°F (0°C to 45°C)

1.2.19. Storage Temperature: -40°F to 158°F (-40°C to 70°C)

1.2.20. Warranty: 3 Years

1.2.21. VLAN, QoS, IGMP Snooping, Link Aggregation

1.2.22. Static Routing, RIP, OSPF, IPv6 support

1.2.23. VxLAN/MPLS/EVPN, Advanced Routing Protocol (BGP/ISIS)

1.2.24. Stacking or MLAG

1.2.25. 1+1 Hot-swappable Power Supplies

2. Transceivers

2.1. Ten (10) Units Transceiver

- 2.1.1. Cisco Compatible: QSFP-100/112G-LR4-20
- 2.1.2. Form Factor: QSFP28
- 2.1.3. Wavelength: 1310nm
- 2.1.4. Max Cable Distance: 20km
- 2.1.5. Connector: LC Duplex
- 2.1.6. Transmitter Type: 4 x LAN WDM DML TOSA
- 2.1.7. DDM/DOM: Supported
- 2.1.8. TX Power(100G): -1.0~4.5dBm
- 2.1.9. TX Power(112G): 0~4dBm
- 2.1.10. Power Consumption: ≤3.5W
- 2.1.11. Modulation Format: NRZ
- 2.1.12. Transmit and Dispersion Penalty: 2.2dB
- 2.1.13. Packaging Technology: BOX Packaging
- 2.1.14. EMC (Electro Magnetic Compatibility): Supported
- 2.1.15. Application: 100GBASE Ethernet, Telecom, 5G Network Mid/Backhaul
- 2.1.16. Data Rate: Dual Rate 103.1Gbps and 112Gbps
- 2.1.17. Cable Type: SMF
- 2.1.18. Receiver Type: 4 x PIN ROSA
- 2.1.19. Commercial Temperature Range: 0 to 70°C (32 to 158°F)
- 2.1.20. Receiver Sensitivity(100G): <-9.5dBm
- 2.1.21. Receiver Sensitivity(112G): <-9.0dBm
- 2.1.22. Extinction Ratio: >4dB
- 2.1.23. CDR (Clock and Data Recovery): TX & RX Built-in CDR
- 2.1.24. Powerbudget: 8.5dB
- 2.1.25. Host FEC: Supported
- 2.1.26. Protocols: 100G Ethernet, 25G Ethernet, OTN OTU4 411-9D1F
- 2.1.27. Warranty: 1 Year

2.2. Forty (40) Units Transceiver

- 2.2.1. Cisco Compatible: QSFP-100G-LR4-I
- 2.2.2. Form Factor: QSFP28
- 2.2.3. Wavelength: 1310nm
- 2.2.4. Max Cable Distance: 10km
- 2.2.5. Connector: LC Duplex
- 2.2.6. Transmitter Type: LAN WDM EML
- 2.2.7. DDM/DOM: Supported
- 2.2.8. TX Power: -4.3~4.5dBm
- 2.2.9. Powerbudget: 6.3dB
- 2.2.10. Power Consumption: ≤4W
- 2.2.11. Modulation Format: NRZ
- 2.2.12. Packaging Technology: BOX Packaging
- 2.2.13. EMC (Electro Magnetic Compatibility): Supported
- 2.2.14. Transmit and Dispersion Penalty: 2.2dB
- 2.2.15. Application: 100GBASE Ethernet, Telecom, 5G Wireless Network
- 2.2.16. Max Data Rate: 103.125Gbps (4x 25.78Gbps)
- 2.2.17. Cable Type: SMF
- 2.2.18. Receiver Type: PIN
- 2.2.19. Industrial Temperature Range: -40 to 85°C (-40 to 185°F)
- 2.2.20. Receiver Sensitivity: <-10.6dBm
- 2.2.21. Receiver Overload: 4.5dBm
- 2.2.22. Extinction Ratio: >4dB
- 2.2.23. CDR (Clock and Data Recovery): TX & RX Built-in CDR
- 2.2.24. Host FEC: Supported

2.2.25. Bit Error Ratio (BER): 1E-12 (without FEC)  
2.2.26. Protocols: IEEE 802.3ba 100GBASE-LR4, IEEE 802.3bm, QSFP28 MSA Compliant  
2.2.27. Warranty: 1 Year  
2.2.28.  $\leq 4W$  low power consumption  
2.2.29. Dual CDR (TX and RX)  
2.2.30. Stainless steel material, anti-corrosion, and salt spray resistance  
2.2.31. Fully compatible with almost all Cisco devices  
2.2.32. Widely used on 100G switches, routers, servers, NICs and other transmission equipment  
2.2.33. Suitable for telecom, service provider applications and 5G wireless network  
2.2.34. IEC60825-1 Class 1 laser safety compliant  
2.2.35. UL 94 V-0 Flammability Rating  
2.2.36. Class B EMC, IEC 61000-4-2 Anti Electro-Static Discharge and IEC61000-4-3 Radiation Resistant  
2.2.37. Compliant with IEEE 802.3ba 100GBASE-LR4 and IEEE 802.3bm CAUI-4 standard  
2.2.38. Wavelength:  
2.2.38.1.: 1295.56nm  
2.2.38.2.: 1300.05nm  
2.2.38.3.: 1304.58nm  
2.2.38.4.: 1309.14nm  
2.2.39. Transmitter Type: LAN WDM EML  
2.2.40. TX Power: -4.3~-4.5dBm  
2.2.41. Receiver Sensitivity: <-10.6dBm  
2.2.42. Receiver Overload: 4.5dBm  
2.2.43. Power Consumption: 4W  
2.2.44. Modulation Format: NRZ

### 2.3. Five Hundred (500) Units Transceiver

2.3.1. Cisco Compatible: SFP-10G-LR-I  
2.3.2. Form Factor: SFP+  
2.3.3. Wavelength: 1310nm  
2.3.4. Max Data Rate: 10.3125Gbps  
2.3.5. Max Cable Distance: 10km  
2.3.6. Connector: LC Duplex  
2.3.7. Transmitter Type: DFB  
2.3.8. DDM/DOM: Supported  
2.3.9. TX Power: -8.2~-0.5dBm  
2.3.10. Power Consumption: <1W  
2.3.11. Bit Error Ratio (BER): 1.00E-12  
2.3.12. Extinction Ratio: >3.5dB  
2.3.13. EMC (Electro Magnetic Compatibility): Supported  
2.3.14. Protocols: IEEE 802.3ae, SFF-8472, SFF-8431, SFF-8432, SFP+ MSA Compliant, CPRI, eCPRI  
2.3.15. Media: SMF  
2.3.16. Receiver Type: PIN  
2.3.17. Industrial Temperature Range: -40 to 85°C (-40 to 185°F)  
2.3.18. Receiver Sensitivity: <-14.4dBm  
2.3.19. Receiver Overload: 0.5dBm  
2.3.20. MTBF: 1,000,000 Hours  
2.3.21. Warranty: 1 Year  
2.3.22. Low power consumption <1W, saving power  
2.3.23. 2ns typical latency, MTBF over 1 million hours  
2.3.24. -40°C~85°C operating temperature  
2.3.25. Stainless steel material, anti-corrosion and salt spray resistance  
2.3.26. Fully compatible with almost all Cisco devices  
2.3.27. Widely used on 10G switches, routers, servers, NICs and other transmission equipment

2.3.28. Suitable for telecommunication, data processing, automation and other harsh industrial environments

2.3.29. IEC60825-1 Class 1 laser safety compliant

2.3.30. Class B EMC, IEC 61000-4-2 Anti Electro-Static Discharge and IEC61000-4-3 Radiation Resistant

2.3.31. Compliant with IEEE 802.3ae, SFF-8472, SFF-8431, SFF-8432, SFP+ MSA, CPRI, eCPRI

3. Transceiver Firmware Upgraders

3.1. One (1) Unit Transceiver Firmware Upgrader

3.1.1. Configure Transceiver to Support 200+ Vendors within Seconds Online

3.1.2. Multi-Functional Box Supports Transceiver Monitoring, Diagnosing and Troubleshooting

3.1.3. Wavelength Tuning for Tunable DWDM

3.1.4. Small and Robust Mobile Tool to Travel Anywhere

3.1.5. Support Windows & Mac OS Operating Systems

3.1.6. BOX Pro Function to Customize Configuration According to Request

3.1.7. Configure Transceiver Compatibility to Save Costs

3.1.8. Supported Operating Systems: Windows (10 or newer), Mac OS (10.13 or newer)

3.1.9. Connector: USB Type-C

3.1.10. Operating Temperature: -10°C~ +60°C

3.1.11. Dimensions (HxWxD): 0.81"x2.87"x5.71" &#039; (20.5x73x145mm)

3.1.12. Supported Form Factors: SFP, SFP+, XFP, SFP28, QSFP+, QSFP28

3.1.13. Supported Browsers: Chrome (68 or newer)

3.1.14. Input Voltage: 5V

3.1.15. Case Material: 6061 Aluminum Alloy & Acrylonitrile Butadiene Styrene

3.1.16. Weight: 164g

3.1.17. Warranty: 1 Year

3.2. One (1) Unit Transceiver Firmware Upgrader

3.2.1. Supported Operating Systems: Windows (10 or newer), Mac OS (10.13 or newer)

3.2.2. Connector: USB Type-C

3.2.3. Operating Temperature: -10°C~ +60°C

3.2.4. Dimensions (HxWxD): 0.81"x2.83"x5.7" &#039; (20.6x72x145mm)

3.2.5. Supported Form Factors: SFP, SFP+, SFP28, XFP, QSFP+, QSFP28

3.2.6. Supported Browsers: Chrome (69 or newer)

3.2.7. Input Voltage: 5V

3.2.8. Case Material: 6061 Aluminum Alloy

3.2.9. Weight: 220g

3.2.10. Warranty: 1 Year

4. One (1) Unit Line Card for Core Router

4.1. Module for upgrading Cisco 9006 as the existing end-user equipment

4.2. Compatible with the Cisco ASR 9006, ASR 9010, ASR 9904, ASR9906, ASR 9910, ASR 9912, and ASR 9922 chassis

4.3. 24 ports of 10 Gigabit/1 Gigabit Ethernet ports per line card

4.4. 10-Gbps IEEE 802.3ba compliant

4.5. 10 Gigabit Ethernet PHY monitoring

4.6. IEEE 802.x flow control

	<p>4.7. Full-duplex operation  4.8. Per-port byte and packet counters for policy drops; oversubscription drops; cyclic redundancy check (CRC) error drops; packet sizes; and unicast, multicast, and broadcast packets  4.9. 24-port dual-rate 10GE/1GE line card: 200-Gbps line-rate throughput, 240:200 oversubscription  4.10. 24-port 10 Gigabit Ethernet Line Card: 14.5 x 1.63 x 22.02 in.; 18.3 lb (est.)  4.11. (368.3 mm x 41.4 mm x 559.3 mm; 8.3 kg)  4.12. Warranty: 1 Year</p> <p>I. Terms of delivery  1. Prices inclusive of Government fees, VAT, taxes and duties  2. Delivery period: within 60 calendar days after issuance of NTP  3. With seven (7) days testing period to check for manufacturers defect before the acceptance  4. Warranty Support shall also include on-site services, parts and labor  5. Service Request  5.1. End-user must be able to request technical support by phone, email or through a website  5.2. Onsite technical support may be requested for special cases or critical severity issues  6. Response Time  6.1. Four (4) business hours, and updates every 3 business days for critical severity issues that impact a high number of staff  6.2. Eight (8) business hours, and updates every 5 business days for high severity issues that incurs serious degradation to application performance or functionality  6.3. Twenty-Four (24) business hours, and updates by request for medium severity issues that moderately impact user operations  6.4. Forty-Eight (48) business hours, and updates by request for low priority issues such as inquiries or issues with limited impact to user operations  7. Proof of ISO compliant / RoHS Compliant in ensuring manufacturer has established a comprehensive quality management system based on the most well-known methods and standards  8. The obligation for warranty shall be submitted upon delivery. It shall be covered by either retention money in an amount equivalent to at least five percent (5%) of every progress payment, or a special bank guarantee equivalent to at least five percent (5%) of the total contract price.</p> <p><i>(Please see attached offer.)</i></p>			
			<b>TOTAL:</b>	<b>₱19,336,681.00</b>
<b>(Total Amount in Words)</b>	<b>Nineteen Million Three Hundred Thirty Six Thousand Six Hundred Eighty One Pesos Only</b>			

The contract price is inclusive of taxes and other fees or charges. In case of failure to make the full delivery within the time specified above, a penalty of one-tenth (1/10) of one percent for every day of delay shall be imposed on the undelivered item/s. Once the cumulative amount of liquidated damages reaches ten percent (10%) of the amount of the contract, DOST-ASTI may rescind or terminate the contract, without prejudice to other courses of action and remedies available under the circumstances and in accordance with the provisions of the latest implementing rules and regulations of RA 9184.

Conforme:

Very Truly Yours,

\_\_\_\_\_  
(Signature over Printed Name of Supplier)

\_\_\_\_\_  
**FRANZ A. DE LEON, Ph.D.**  
Director, DOST-ASTI



\_\_\_\_\_  
(Date)

<b>Fund Cluster:</b>	<u>01</u>	ORS / BURS No.:	<u>011011012021-09-000570</u>
		ORS / BURS Date:	<u>September 29, 2021</u>
<b>Funds Available:</b>	<u>Php 19,336,681.00</u>	Amount:	<u>₱ 19,336,681.00</u>
 <b>GAY CONCEPCION S. BUGAGAO</b> _____ Accountant III			



28 September 2021

**NOTICE TO PROCEED**  
**PUBLIC BIDDING**

**Ms. ROSEMARIE L. TRINIDAD**  
 Solutions Consultant  
**Microdata Systems Management, Inc.**  
 199 CM Recto Cor. A. Mabini St.,  
 Brgy. Addition Hills, San Juan City

Dear Ms. Trinidad,

Notice is hereby given to **Microdata Systems Management, Inc.** that work/delivery may proceed for the following procurement details:

Contract Name	:	<b>Supply and Delivery of One (1) lot Network Equipment</b>
Purchase Request No.	:	<b>GAA-21-05-11417</b>
Purchase / Work Order No.	:	<b>21-09-166</b>
Total Contract Price	:	<b>Php 19,336,681.00</b>
(inclusive of taxes, import duties and all other charges or fees)		
Total Contract Price in Words	:	<b>Nineteen Million Three Hundred Thirty Six Thousand Six Hundred Eighty One Pesos</b>

Upon signing receipt of this Notice, you are responsible for performing the services under the terms and conditions of the Agreement/Purchase Order/Work Order and in accordance with the schedule of requirements/delivery schedule.

You are also hereby required to file a Warranty Security for a minimum period of three (3) months, in the case of Expendable Supplies, or a minimum period of one (1) year, in the case of Non-Expendable Supplies, after acceptance by the Procuring Entity of the delivered supplies. It shall be either retention money in an amount equivalent to at least Five percent (5%) of every progress payment, or a special bank guarantee equivalent to at least Five percent (5%) of the total contract price. The said amounts shall only be released after the lapse of the warranty period or, in the case of Expendable Supplies, after consumption thereof: Provided, however, That the supplies delivered are free from patent and latent defects and all the conditions imposed under the contract have been fully met.

Note that failure to comply with the above requirements and failure to perform the services under the terms and conditions of the Agreement/Purchase Order/Work Order may constitute grounds for its forfeiture.

Please acknowledge receipt and acceptance of this Notice by signing in the space provided below. There are two (2) copies of this document; you may keep one copy and return the other to the Bids and Awards Committee (BAC) Secretariat of the Advanced Science and Technology Institute. Should you have any questions or clarifications, you may reach us at bac-sec@asti.dost.gov.ph.

Respectfully,

**FRANZ A. DE LEON, Ph.D.**  
 Director



<b>DATE OF ISSUANCE:</b>	<b>RECEIVED BY:</b>	<b>WARRANTY SECURITY</b>
_____	_____ (Signature over Printed Name)	Type of Warranty Security: _____
	_____	Amount of Warranty Security: <b>P</b> _____
	_____ (Date and Time)	O.R. No.: _____