

CORRIGENDUM TO REQUEST FOR PROPOSAL (RFP) FOR SUPPLY, INSTALLATION, IMPLEMENTATION AND SUPPORT OF CTS-DEM (CHEQUE TRUNCATION SYSTEM-DATA EXCHANGE MODULE) FOR THREE GRIDS (WESTERN (MUMBAI), SOUTH (CHENNAI) AND NORTH (DELHI)) ON CAPEX MODEL

RFP Ref.No.252018 Dated 27.03.2019

With reference to RFP Ref.No.252018 Dated 27.03.2019 published on our website <https://www.bankofmaharashtra.in>, following amendments to the RFP document are made with immediate effect.

1. Bid Collection and Submission schedule stands revised as under:

RFP Reference Number	252018
Cost of RFP document	Rs.17,700/- (Rs. Seventeen Thousand and Seven Hundred Only) inclusive of applicable GST
Earnest Money Deposit (EMD) amount	Rs. 5,00,000/- (Rs. Five Lacs Only)
Date of commencement of sale of RFP document	27.03.2019
Last Date of Sale of RFP Document	24.04.2019 14:00 Hours
Queries to be mailed by	03.04.2019 23:59 Hours
Pre-Bid meeting	04.04.2019 11:00 Hours
Last Date and time for Bid Submission (Soft copy and hard copy)	24.04.2019 14:00 Hours
Date of Opening of Eligibility Bid and Technical Bids	24.04.2019 15:00 Hours
Place of opening of RFP Offers	THE DEPUTY GENERAL MANAGER, INFORMATION TECHNOLOGY, HEAD OFFICE, BANK OF MAHARASHTRA, 1501, 'LOKMANGAL', SHIVAJINAGAR PUNE-411005
Address for Communication	As Above
Contact Telephone/ Fax Numbers	020 – 25614423 020 – 25614350
Email address (For any correspondence related to this RFP)	akshay.bansod@mahabank.co.in sweety.ratner@mahabank.co.in anuradha.palnitkar@mahabank.co.in abhishek.lal@mahabank.co.in cmrecondg@mahabank.co.in agmitd@mahabank.co.in
Website	https://www.bankofmaharashtra.in

* Bidders have to purchase tender document to participate in pre-bid meeting.

Exemption for Price for Tender Copy & EMD for Eligible Bidders as mentioned in Eligibility Criteria.

2. Technical and functional specification of DEM solution shall be as per **Annexure-A** of this document

3. Commercial Bid Format (Annexure-8 of the RFP document) stands revised as **Annexure-B** of this document
4. Any other clarifications can be sought from following officers, who have been authorized to accept the tender documents:
 - a. Shri. Abhishek Narayan Lal, Sr. Manager- Head Office Pune
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ANNEXURE A: Technical and functional specifications of DEM

1. The technical specifications will be as per the updated DEM specifications document released by NPCI vide circular no. NPCI/2018-19/CTS/027 dated 15.10.2018 with subsequent updates, if any.
2. The DEM software should support separate user login and access rights management.
3. The DEM solution should be in Active-Active configuration. This means the DEM server at DC and the DEM server at DR should be able to process clearing simultaneously.
4. The DEM solution will also have an Active Local redundant at Primary (DC) as well as secondary (DR) site.
5. DEM solution should support switch over of all traffic to DR from primary site during and between sessions in case of any issue in primary site and Vice Versa.
6. In case of a switch-over, DEM software should replicate all necessary data between servers/sites.
7. In case, the DEM solution needs to be reinstalled/configured, the same shall be the responsibility of the successful bidder.
8. In case, NPCI issues change(s) in technical or functional specifications of DEM solution during the entire contract period, the same shall be provided by the bidder to the Bank free of any costs.

9. FUNCTIONAL REQUIREMENTS OF DEM:

a. Registration of DEM

- i. Submission of registration request for each DEM installation with mandatory fields filled in. Following is the list of fields for registration of a DEM installation. Mandatory fields are denoted by *.
 1. DEM Name
 2. DEM ID
 3. Bank Routing Number *
 4. Access Identifier *
 5. Access Type *
 6. IP Address *
 7. Primary & Secondary PKI certificates *
 8. SFTP login credentials *
 9. Contact details: *
 - a. Name
 - b. Email
 - c. Phone Number
 - d. DEM Vendor
- ii. After the installation and configuration is completed at bank premises, bank must access the unique URL to activate the registration. DEM cannot exchange data with CH unless the installation is activated. It is mandatory to access the URL from the IP address provided during registration process. ***The URL provided is unique per registration request and can be used only once.***
- iii. Requisite details to be configured in DEM for future usage as under:
 1. IP address to send HTTPS message to Primary CH
 2. IP address to send HTTPS message to Secondary CH

3. List of IP addresses to send SFTP requests to Primary CH
4. List of IP addresses to send SFTP requests to Secondary CH
5. SFTP folder name at remote location to exchange inward and outward files(CHM) file
6. URL to access CH for HTTPS messages and key exchange in the format: "https:\\CH/token 1 /token2....
 - a. Same URL needs to be used to communicate to CH by replacing "CH" with primary or secondary CH IP, as applicable

b. Submitting Outward Files

- i. DEM will receive the outward files from Capture System.
- ii. DEM shall have no or minimum delay to pick up the files from Capture
- iii. DEM shall digitally sign the entire contents of individual file using bank"s private key*
- iv. After successful signing, the entire contents including the digital sign shall be encrypted using public key of CH
- v. After encryption, the file is ready to send. To initiate transmission, DEM must send a HTTPS message as per NPCI format.
- vi. This HTTPS request must be sent to the CH HTTPS URL received during registration process.
- vii. DEM shall wait for response of this message before initiating SFTP transmission.
- viii. DEM shall not proceed with transmission if any of the following is true:
 1. The HTTPS request timed out
 2. Errcode has a non-zero value
 3. Filetype and Reqtype values are not as expected
 4. Ftphostname is not one of the SFTP server IP addresses provided by CH during registration process
- ix. After receiving valid response from CH, DEM shall establish the SFTP connection using login credentials set during registration process.
- x. Upon successful connection, DEM shall send files listed in the initiation message
 - xi. to CH over SFTP with a temporary name.
- xii. Files received at CH are mapped against the names received in the corresponding message. Files not listed in the message will be ignored by CH
- xiii. After each file is transmitted successfully, DEM shall rename the file to its original name
- xiv. It is advised to use temporary name by appending ".tmp" at the end of original file name. The ".tmp" string can be removed during the rename operation.
- xv. The file upload must be done to the folder location for file exchange received during registration process.
- xvi. After successful upload of files, the SFTP connection must be closed after logging out. Also, a timeout of 5min shall be set for idle/non-responding sessions.

- xvii. Not closing the login session and SFTP connection can result in exhausting SFTP connections which will prohibit the DEM from sending files for duration set by NPCI.
- xviii. It is recommended that DEM shall implement timeout and retries for HTTPS messages and SFTP connection and transmission requests.
- xix. It is advised to send corresponding CXF, CIBF and .DONE files in a single HTTPS message to avoid delay in processing.
- xx. It is advised that DEM should keep a local backup of all uploaded files as CH may request them in future again.

c. Retrieving Inward Files

- i. Periodically, DEM shall check for un-retrieved inward files to be present at primary and secondary CH and shall retrieve them, if present. To do so, DEM must follow following steps.
- ii. It is important that DEM should check and retrieve files from primary and secondary CH to support disaster or switchover scenario
- iii. To initiate retrieval, DEM must send a HTTPS message as per NPCI format. For sample content of a file after signature and encryption refer NPCI technical specification document
- iv. This HTTPS request must be sent to the CH HTTPS URL received during registration process.
- v. DEM shall wait for response of this message before initiating SFTP transmission.
- vi. DEM shall not proceed with transmission if any of the following is true:
 - 1. The HTTPS request timed out
 - 2. Errcode has a non-zero value
 - 3. Filetype and Reqtype values are not as expected
 - 4. Ftphostname is not one of the SFTP server IP addresses provided by CH during registration process
- vii. After receiving valid response from CH, DEM shall establish the SFTP connection using login credentials set during registration process.
- viii. Upon successful connection, DEM shall check if there are any files present at the FTP folder locations received during registration process (for file exchange and for CHM) matching with file name pattern as given in the CHI specification document for inward files.
It is recommended to match maximum possible file name pattern to avoid overheads on DEM
- ix. It is mandatory to have the file types and paths configurable to ensure extensibility of the application. E.g., in future, DEM can be configured to transmit new file types as well or the folder structure can be changed.
- x. In case any such files are present, DEM shall download all files to local directory.
- xi. DEM must download the files efficiently. Ideally, DEM shall retrieve one file in one FTP session. In case of multiple files per FTP session, the number of files to be retrieved per session must be configurable.
- xii. Total count of FTP sessions a DEM can open with CH must be configurable and shall be set to the value advised by NPCI.

- xiii. DEM must scan through all remote folders and subfolders to identify files to download
- xiv. DEM shall decrypt and verify signature of all files before making the files available to Capture System
 Decryption and Signature verification operations shall be configurable per file type. This is required to support zero KB files (e.g. EOS files) and other file types such as PDF and CSV.
 Note: NPCI reserves the right to change the file types, naming convention and applicability of signing, encryption (one or both) for any inward or outward file type. Hence, this must be configurable.
- xv. After making each file available to Capture System, DEM must send HTTPS message as per NPCI format.
- xvi. As a response to above HTTPS message, DEM must wait for following response before marking the retrieval as complete:

```
<handshake>
<errcode>0</errcode>
<filetype> I N</filetype>
<reqtype>A</reqtype>
</handshake>
```
- xvii. DEM must ensure that above HTTPS message is sent and response with errcode zero is received. This is required to ensure that same file(s) is/are not available for duplicate download. Any failure in this confirmation message exchange may keep the file available for download and result in downloading same file(s) multiple times.
- xviii. After successful download of files, the SFTP connection must be closed after logging out. Also, a timeout of 5min shall be set for idle/non-responding sessions.
Not closing the login session and SFTP connection can result in exhausting SFTP connections which will prohibit the DEM from sending files for duration set by NPCI.
- xix. DEM shall perform download activity sequentially in such a way that only one download is in progress for one file type at a given point in time. Parallel download may result in corruption of files on disk
- xx. It is recommended that DEM shall implement timeout and retries for HTTPS messages and SFTP connection and transmission requests.
- xxi. It is recommended to have the time between two successive checks for inward files as configurable

d. Switchover of CH

- i. During retrieval of inward files, DEM shall also check for switchover files at primary as well as secondary CH. A switchover file is a zero-kb file with naming convention "DEM_ID_switchover.txt."
- ii. As and when the switchover file is received, DEM shall swap the IP addresses between primary and secondary CH. This shall result into DEM pointing to the secondary CH.

Note: Secondary CH is the CH to which DEM is not sending outward files. E.g., if a DEM in Western GRID is sending outward to Mumbai, the DR site i.e. Hyderabad becomes secondary. Similarly, when

DEM is sending outward files to Hyderabad, Mumbai site becomes secondary.

- iii. After swapping the IP addresses, DEM shall rename the remote file by appending “.processed” at the end of name of the file.
- iv. The switch of IP addresses shall be applicable for HTTPS IP and SFTP server IP addresses.

e. Resend of Files

- i. DEM shall retrieve files to be resent and process as per NPCI specifications / process flow.

f. Data Reconciliation

- i. For reconciliation, DEM must send count of presented and retrieved files to CH periodically.
- ii. It is required to send the reconciliation file, as per NPCI format at the end of each presentment or retrieval cycle.
- iii. Optionally, DEM can have an independent routine executed periodically to send the reconciliation file
- iv. It is recommended to send reconciliation file every 30 seconds.

10. SECURITY REQUIREMENTS

a. Secure Exchange

- i. It is a must for DEM to use HTTPS protocol for message exchange. HTTP protocol will be blocked at CH.
- ii. It is must for DEM to use SFTP for file exchange. FTP and FTPS will be blocked at CH
- iii. It is must for DEM to use Hardware Security Module (HSM) for key storage, signing and encryption.
- iv. In memory encryption is not permitted for security reasons. The application is expected to send data to HSM card for signing and encryption on HSM card.
- v. The port numbers for HTTPS and SFTP communication must be configurable at DEM.
- vi. DEM must support communication using TLS 1.1 and above.

b. PKI for Data in Transit

i. Outward Files

- 1. DEM shall have
 - a. security algorithms and topologies as per NPCI specifications
 - b. Digital Signature header as per NPCI format
 - c. Encryption header information as Per NPCI format
- 2. Following outward file types are required to have signing and encryption:
 - a. CXF
 - b. CIBF
 - c. RRF
- 3. Following outward file types does not require signing and encryption:

- a. Reconciliation file
- ii. **Inward Files**
 - 1. Encryption Header as per NPCI format
 - 2. Digital Signature header as per NPCI format
 - 3. Following inward file types are required to have signature verification and decryption:
 - a. RES
 - b. OACK
 - c. PXF
 - d. PIBF
 - e. RF6. EF
 - 4. Following inward file types does not require signature verification and decryption:
 - a. EOS
 - b. RESEND
 - c. SWITCHOVER
 - d. PDF
 - e. CHM
- iii. **Dynamic Key Seeding and Revocation**
 - 1. DEM requires following keys for various PKI operations:
 - a. Private key of DEM which is accessed by alias name created
 - b. Public key of CH
 - 2. At bank, the private keys for DEM are stored on HSM card / network HSM and the key alias name is stored at CH during certificate registration
 - 3. At application startup, DEM shall make a HTTPS call to retrieve the CH public key and key alias name for bank key.
 - 4. The URL to send the HTTPS request will be provided by NPCI at later stage.
 - 5. Request format will be as per NPCI specification
 - 6. DEM shall stop processing of files in case the HTTPS call fails or error code is non-zero.
 - 7. At CH,
 - a. Public key is refreshed at interval of 4hours
 - b. Certificate Revocation List (CRL) are updated at interval of 4hours
 - 8. Hence, it is mandatory for DEM to refresh the keys every 4hours minimum to ensure un-interrupted operation of DEM.
 - 9. It is recommended to have automated key exchange at DEM.

11. NON FUNCTIONAL REQUIREMENTS

a. Performance

- i. DEM shall be designed to process required daily volumes for the bank.
- ii. As a standard design basis for CTS, DEM shall be capable of processing 40% of daily volume of the bank in one hour. This shall include processing from sending the initiation HTTPS message till closure of SFTP session.

b. Architecture

- i. DEM shall support scalable architecture. This should include vertical as well as horizontal scaling. The proposed solution should support multiple DEMs, as required by the Bank and support Load Distribution, Data Segregation etc.
 - ii. The file exchange with CH shall be unattended and shall not require any manual intervention after the files are available from capture.
- c. **High Availability**
 - i. DR DEM shall be registered at CH with distinct DEM ID
 - ii. DEM must be capable of replicating the retrieved files from one DEM to corresponding DR site. Files downloaded once will not be available for download again from CH.
 - iii. Primary and DR DEM cannot process same file(s) in parallel as it will lead in corruption of files at CH. However, banks can have multiple DEM dedicated per branch or per city
- d. **Resilience**
 - i. DEM shall be capable of processing the data 24 hours on a business day
 - ii. DEM application shall sustain data processing for minimum of 24 hours without any restart or errors
 - iii. The resource consumption of DEM shall be below 60% (or bank's corporate guideline, whichever is lower) of available resources.
 - iv. DEM shall facilitate automated data and log clean-up.
- e. **Auditing and Logging**
 - i. DEM shall create an audit log as per NPCI and Bank's specifications
 - ii. All audit logs must have details of DEMID, IP address, User ID, timestamp (up to seconds) as applicable.
 - iii. DEM application shall log all errors occurred along with details of the operation and/or file being processed.

ANNEXURE B: Commercial Bid Format

For arriving at the TCO, the following table will be considered:

1. Name of Bidder :

2. COST OF CTS PROJECT:

Schedule-I (Bill of Material)				
Sl. No.	Item Description	Qty	Unit Price/Rate	Total Price
1	License for DEM Software at Primary Site including 1. Local Active Redundant (Redundant DEM software at Primary site) 2. License for DEM Software at Secondary Site including Local Active Redundant (Redundant DEM software at Secondary site) 3. 1 Year Warranty & ATS 4. Customization and implementation charges 5. All necessary 3 rd Party Software essential for functioning of DEM Solution except Hardware, OS and Database.	3(one for each Grid)		
2	Cost of CTS solution including 1. Customization and implementation costs 2. 1 Year Warranty & ATS 3. Implementation of primary site along with its local redundant. 4. Implementation of secondary site. 5. All necessary 3 rd Party Software essential for functioning of CTS Solution except Hardware, OS and Database.	1(CTS solution shall be single among all three grids)		
3	AMC/ATS of DEM software (shall be in % of the line item No.1 of this Schedule)	4 Years. X 3(one for each Grid)	%	
4	AMC/ATS of CTS software (shall be in % of the line item No.1 of this Schedule)	4 Years X 1(CTS solution shall be single among all three grids)	%	

5	Annual FM Charges as per Schedule II	5 Years		
TCO(Total Cost Of Ownership)				

Note: All prices mentioned herein are inclusive of all taxes/charges except GST

Schedule II (Annual FM Charges)				
Sl. No.	FM Description (eg. L1 Resource, L2 Resource etc.)	Qty	Monthly Charges	Total Prices (=Qty X Monthly Charges X12)
1	Project Manager/L3 Resource	1		
2	L2 Resource	1		
3	L1 Resource	2		
GRAND TOTAL				