



# NATIONAL INSTITUTE OF TECHNOLOGY TIRUCHIRAPPALLI – 15

## Department of Electronics and Communication Engineering

Web : [www.nitt.edu](http://www.nitt.edu)

Phone : 0431 - 2503030

## TENDER DOCUMENT

Tender Notification No.: NITT/F-10/PLAN 2012-13/R&C

Dated: 18.01.2013

Name of the equipment/software & Quantity required : **Multiparty conferencing system**

S.No.	Name of the Component/Equipment/Software Tools	Required Quantity
1.	<b>Multipoint System</b> - 4 ports on one server in IP @ 4Mbps or more on each port with Adaptation on each port (frame rate matching & resolution matching), CP and VA Layouts with 1080p or higher resolution for each and every port. <b>Users</b> - System should support registration of upto 50 users. System should support a total of 4 concurrent Endpoints to be connected in either point to point or multi-point calls. <b>No.of simultaneous calls recorded</b> <ul style="list-style-type: none"><li>It should be possible to establish 1-2 parallel calls and it should be possible to record each and every call for playing back later.</li><li>Typically This would be used for lectures delivered by 2 teachers in parallel for students located in two different class rooms.</li></ul> Each teacher should be able to start, pause, resume and stop the recording of the lectures at the click of a button.	1no
2.	<b>Multipoint Server</b> - This appliance should provide a centralized, web based, simple, enterprise-wide conference and user management. It includes a web server, Database and should be based on a hardened operating system.	1no
3	<b>USB HD PTZ CAMERA FOR DESKTOP USERS</b> USB based HD Web Camera and necessary software drivers for Windows XP/Vista/Windows 7 to support live video capture at 720p at 30 frames per second. Optical zoom 10X or higher, PAN 360 degrees	1-4 no
4	<b>PTZ CAMERA WITH S VIDEO OUTPUT AND USB CAPTURE CARD</b> PTZ 1/4" CCD camera with 500-570 TVL resolution/640X480 resolution, optical zoom 10X or higher, 360 degrees zoom, 180 degrees tilt, S video output along with S video to USB capture card camera	1-4 no
5	<b>USB DESKTOP HANDS FREE MICROPPHONES FOR DESKTOP USERS</b> USB based hands free Microphone and Speaker Device having embedded DSP and built-in Echo cancellation, Noise cancellation, De-Reverb, Microphone Mute/Un-mute and Volume Control buttons for full Duplex Audio and hands free operation. It should have built-in ringer and good pickup of audio for normal conversation even from a distance of 8 feet.	1-4no

**EMD**

Cost of the Tender Document

: **Rs. 14, 000/-.**

: **Rs. 150/-**

Delivery

Address for submission of Tender :

: **45 days**

The Director,

National Institute of Technology,

Tiruchirappalli 620015, Tamilnadu.

**ATTN to:** Dr.B.Venkataramani / R&C

**E-mail** : [bvenki@nitt.edu](mailto:bvenki@nitt.edu)

Last Date of submission of Tender : **01.02.2013 up to 3.00 p.m.**

Date of opening of Technical Bid : **01.02.2013 at 4.00 p.m.**



**NATIONAL INSTITUTE OF TECHNOLOGY  
TIRUCHIRAPPALLI – 15**

**OFFICE OF RESEARCH AND CONSULTANCY**

Tender Notification No.: NITT/F-10/PLAN 2012-13/R&C

Dated: 18.1.2013

**NOTICE INVITING TENDER**

The National Institute of Technology, Tiruchirappalli (NITT) is an autonomous body under MHRD, GOI, imparting Technical Education and engaged in Research Activities. It is proposed to procure the following component for the institute academic/research activities.

Sealed Quotations under **two cover system** are invited for the following Equipments and software for multiparty conferencing system for the R&C office subject to the following terms and conditions, from the reputed manufacturers or their authorized dealers so as to reach this office on or before scheduled date and time. See section 6 for the details of the proposed multiparty conferencing system .

S.No.	Name of the Component/Equipment/Software Tools	Required Quantity
1.	Multipoint System - 4 ports on one server in IP @ 4Mbps or more on each port with Adaptation on each port (frame rate matching & resolution matching), CP and VA Layouts with 1080p or higher resolution for each and every port. Users - System should support registration of upto 50 users. System should support a total of 4 concurrent Endpoints to be connected in either point to point or multi-point calls. No.of simultaneous calls recorded <ul style="list-style-type: none"><li>• It should be possible to establish 1-2 parallel calls and it should be possible to record each and every call for playing back later.</li><li>• Typically This would be used for lectures delivered by 2 teachers in parallel for students located in two different class rooms.</li></ul> Each teacher should be able to start, pause, resume and stop the recording of the lectures at the click of a button.	<b>1no</b>
2.	Multipoint Server - This appliance should provide a centralized, web based, simple, enterprise-wide conference and user management. It includes a web server, Database and should be based on a hardened operating system.	<b>1no</b>
3	<b>USB HD PTZ CAMERA FOR DESKTOP USERS</b> USB based HD Web Camera and necessary software drivers for Windows XP/Vista/Windows 7 to support live video capture at 720p at 30 frames per second. Optical zoom 10X or higher, PAN 360 degrees	<b>1-4 no</b>
4	<b>PTZ CAMERA WITH S VIDEO OUTPUT AND USB CAPTURE CARD</b> PTZ ¼”CCD camera with 500-570 TVL resolution/640X480 resolution, optical zoom 10X or higher, 360 degrees zoom, 180 degrees tilt, S video output along with S video to USB capture card Camera	<b>1-4 no</b>
5	<b>USB DESKTOP HANDS FREE MICROPPHONES FOR DESKTOP USERS</b> USB based hands free Microphone and Speaker Device having embedded DSP and built-in Echo cancellation, Noise cancellation, De-Reverb, Microphone Mute/Un-mute and Volume Control buttons for full Duplex Audio and hands free operation. It should have built-in ringer and good pickup of audio for normal conversation even from a distance of 8 feet.	<b>1-4no</b>

- **All the bidders are required to give the demo and presentation on the products to be quoted before the submission of the quote. Please contact Prof. B. Venkataramani (bvenki@nitt.edu) for fixing up the appointment.**
- **A prebid meeting is proposed to be held on 24<sup>th</sup> JAN 2013 at 3 PM .** Proceedings of the prebid meeting would be put in the NITT web site. It is mandatory for the bidders to go through these proceedings and give their quotes taking this into account.
- The bidders should provide a list of institutions (IITs/NITs) where the quoted products are already supplied by them and operational. POs and the contact numbers of the purchaser should be provided. In addition to this, a certificate from the purchasers that these items are performing satisfactorily should be enclosed.
- The bidders should give a declaration that they have quoted for all the items. Only the price bids of the bidders meeting the technical compliance bid would be opened.

**EMD** : **Rs. 14, 000/-.**  
 Cost of the Tender Document : **Rs. 150/-**

Time for completion of supply after placing purchase order : **45 days**  
 Tender to be submitted at the following address : The Director,  
 National Institute of Technology,  
 Tiruchirappalli– 620015, Tamilnadu, India.  
**ATTN** : Dr. B.Venkataramani /ECE  
**E-mail** : [bvenki@nitt.edu](mailto:bvenki@nitt.edu)

**Last Date of submission of Tender** : **01.02.2013 upto 3.00 p.m.**

**Place, Date and time of opening of Technical Bid** : **01.02.2013 4.00 p.m.** **Venue:** Main Store room

Bidders or their authorized agents may be present at the time of opening the technical bids

**Note** : The Institute shall not be responsible for any postal delay about non-receipt / non delivery of the bids or due to wrong addressee.

## INSTRUCTIONS TO BIDDERS

**BIDDER'S COPY**

1. This document set contains the following:
  - a) Terms and conditions of the Tender
  - b) Details of the Firm offering this Quote
  - c) Technical Compliance Form
  - c) Quotation form (Price Bid and Technical bid)
  - d) Currency Form (quoted on behalf of the foreign suppliers)
  - d) NIT-T's check list copy
2. The bidder's copy is for your future records. Please fill in and return only NIT-T's copy.
3. The bidder should give details of their technical soundness and provide list of customers of previous supply of similar items to Universities, Institutes or Government Departments/Undertakings/public sectors with contact details. The details of the agency/profile should be furnished along with the copy of all related documents.
4. Read through the terms and conditions given and affix your signature and seal if you find them acceptable. Any deviations may be recorded. Read carefully list of specifications that we have enclosed.
5. Fill in the questionnaire regarding the Firm.
6. The downloaded documents '**Technical Compliance Form**' and '**Quotation Form (Price Bid)**' should be **TYPE WRITTEN USING CAPITAL LETTERS ONLY**. At the time of filling the "**Quotation Form (Price Bid)**" make sure that you have not missed anything. Specify the model number & specification for each item. The form should be filled item-wise. Do not leave blank fields. If you are not quoting for a specific item, you should specify "**NOT QUOTING**".
7. **Do not use** ambiguous terms like "**yes**", "**complied**" or "**available**". Specifically mention the matching specification of the product offered by you. Make sure that you have affixed your signature with date and seal on all the documents.
8. Please send the tenders in a sealed envelope super scribed as "**QUOTATIONS AGAINST TENDER NOTIFICATION NO: NITT/F-10/PLAN 2012-13/R&C dt 18.1.2013 Multiparty conferencing system :**" so as to reach "The Registrar, National Institute of Technology, Tiruchirappalli - 620 015, India" on or before **1.02.2013 up to 3.00 p.m. along with a Softcopy of the Technical Compliance form and Quotation Forms in MS-Excel file format in a CD/DVD or USB drive.**
9. For any further clarifications, contact by E-Mail: [bvenki@nitt.edu](mailto:bvenki@nitt.edu) or by written request to "The Registrar, National Institute of Technology, Tiruchirappalli - 620 015, India"
10. Prebid conference will be held on **24th JAN 2013** at 3 PM

**Last Date for receipt of tender at NIT-T : 01.02.2013 up to 3.00 p.m.**

**Opening Date for Tender : 01.02.2013 at 4.00 p.m.**

### **CHECKLIST TO BE FILLED IN BY BIDDER**

List of documents to be enclosed	Completed & Signed
1. Terms and Conditions form	YES / NO
2. Details of the Firm offering this Quote	YES / NO
3. NIT-T's Quotation form (Technical & Price Bid)	YES / NO
4. Currency Form(quoted on behalf of the foreign suppliers)	YES / NO
5. Other technical specifications & pamphlets	YES / NO

- Note:** 1. "Cover" should contain the following:
- a. Form of "**Acceptance of Terms and Conditions**".
  - b. Form of "**Firms details**"
  - c. Pamphlets, if any (in a separate sealed cover)
2. Quotation Form (Technical, Price Bid and Currency Form)

**Please retain this page with you for your future reference.**

Section 1. IN THE CASE OF TWO BID TENDERS

1.1 *Bids are to be submitted under two cover system.*

1.2 **Cover 1:**

**Cover 1 should contain the following:**

- a. *EMD - Earnest Money Deposit (EMD) is to be remitted by way of Demand Draft drawn on any Nationalised bank in India by Demand Draft drawn on any scheduled bank in favour of “The Director, NIT, Trichy” payable at Trichy should be submitted. EMD shall bear no interest. Any bid not accompanying with EMD is liable to be treated as non-responsive and rejected.*
- b. *Technical pamphlets*
- c. *Detailed technical specification*
- d. *The agency should furnish copy of license certificate for manufacture/supply of the item\**
- e. *The agency should furnish Income Tax PAN number & TIN number.\**
- f. *The agency should furnish the last three years balance sheet approved by the CA and the IT clearance certificate.\**
- g. *Warranty period offered for the tendered item to be specified. If the warranty period is not conforming with the schedule of requirements given in section 3 of the document, the bid is liable to be treated as non-responsive and rejected.*
- h. *Duly filled up technical questionnaire, if any*
- i. *Duly filled up deviation schedules to technical specification*
- j. *Copy of supply orders completed during the last three years*
- k. *If the prices are revealed in the cover 1, the offer will be summarily rejected*

1.3 *The cover 1 shall be super scribed as ‘Technical cover’ duly indicating the Tender reference No. and the due date of opening.*

*\* Appropriately pertaining to the country of origin.*

1.3 **Cover 2:**

**Cover 2 should contain the following**

*Cover 2 shall contain Price only and shall be super scribed as ‘Price Cover’ duly indicating the Tender Reference No. and the due date of opening.*

*Each Cover shall be sent in a double sealed cover. The inner covers (Cover 1 and Cover 2) should be sealed individually with the Sellers’s distinctive seal and super scribed with the tender reference no. and due date of opening. Both the inner covers shall be placed in a common outer cover which shall also be sealed with seller’s distinctive seal and super scribed with the tender reference no. and due date of opening.*

*Mention “Kind Attention: Dr.B. Venkataramani, and submit at the address given in the Notice Inviting Tender.*

*Cover 1 will be opened on the scheduled date and time mentioned in the tender enquiry.*

*Cover 2 of the technically and commercially suitable offers alone will be opened on a date which will be intimated to the qualified bidders.*

## Section 2. “TERMS AND CONDITIONS FORM”

### **IMPORTANT: READ ALL THE FOLLOWING TERMS AND CONDITIONS AND SIGN THE ACCEPTANCE CLAUSE FOLLOWING IT**

1. The offers should be addressed to “The Registrar, National Institute of Technology, Tiruchirappalli 620015, India” and should be sent in a sealed envelope super scribed “**QUOTATIONS AGAINST Tender Notification No.: NITT/F-10/PLAN 2012-13/R&C** “**Multiparty conferencing system** ” so as to reach us **on or before 1.02.2013 up to 3.00 p.m.**
2. Each offer should be sent in a sealed cover with the tender documents. Tenders received through email or FAX will not be considered. **Softcopy of the Technical Compliance form and Quotation Forms should be submitted along with the tender in MS-Excel file format in a CD/DVD or USB drive. However, if there is any dispute between Hard copy and Soft copy, Hard copy will be taken.**
3. The tenders will be opened on **1.02.2013 at 4.00 p.m.** in the presence of the vendors present with authorization letter from the respective companies / firms. Suppliers intending to attend the tender opening should intimate us in advance.
4. Full technical specifications and pamphlets should be sent along with the tenders. **Offers without proper technical specifications will be rejected.**
5. The rate quoted should be on unit basis excluding Taxes. Taxes and other charges should be quoted separately, considering exemptions if any.
6. All offers should indicate the taxes and duties applicable, if any. Additional charges for packing, forwarding, freight, insurance etc., if any, should be clearly mentioned. Clearance at Customs will be arranged by us.
7. NIT-T is paying concessional Customs & Excise duty under Government of India Notification No.51/96 for Central Customs and 10/97 for Central Excise Duty vide Certificate No.TU/V/RG-CDE(183)/2011 dt.10.10.11. Currently the purchaser is paying 5% Basic Customs Duty, 2% Educational Cess on Basic Customs Duty, 1% Higher Education Cess on Educational Cess, and 4% Import Additional Duty.
8. The Institute is not authorized to issue C and D forms of Sales tax certificate.
9. In case the offered items are to be imported, the rates should be quoted in foreign currency on C.I.F. Chennai Airport basis, and it should include the Freight up to Chennai airport and the insurance cover should be up to National Institute of Technology, Tiruchirappalli. NIT-T shall pay Customs duty if any.
10. If the price quoted is in foreign currency and if the order value is more than US\$10,000 then 100% payment will be made through **Letter of Credit (LC) at sight on acceptance.** If the order value is less than US\$10,000 , then 100% payment will be through a Telegraphic Transfer (TT). **The bank charges outside India should be borne by the Supplier / Beneficiary. Part shipment not allowed.** If the price quoted is in Indian Rupees, then 100% payment will be made only after installation and commissioning. **No advance payment will be made.**
11. No revision of the price bid will be allowed once the price bids are opened. In case of foreign currency, the agency should mention the % of currency fluctuations they can bear.
12. No increase in price will be allowed after our firm orders are placed.
13. **Payment of excise duty and sales tax / VAT (on ultimate products)** as applicable on the closing date of tender will be to the supplier’s / contractor’s account. Any statutory variation (both plus and minus) in the rate of excise duty/sales tax/VAT after closing date of tender/revised price bid but before the expiry of the contractual delivery / completion period will be to the account of the office.  
The bidder(s) will indicate, in their bid, the amount with exact rate of the Excise and Sales tax/VAT on ultimate finished product, as applicable at tendering stage, separately in the bid. In case the above information subsequently proves wrong, incorrect or misleading (a) this Institute will have no liability to reimburse the excess in the difference in rates of the item under which the duty/tax assessed finally (b) this Institute will have the right to recover the difference in case the rate of duty / tax finally assessed is on the lower side.  
Any increase in excise duty, sales tax / VAT during extended period of the contract / supply order will be to supplier’s / contractor’s account where such extension in delivery of the materials/completion of the project was on the request of supplier / contractor. However, any decrease in excise duty/sales tax/ VAT during extended period of the contract / supply order, will be to the account of this Institute.

14. The warranty period should be clearly mentioned. The maintenance charges (AMC) under different schemes after the expiry of the warranty should also be mentioned.
15. Quote should come from authorized dealer or distributor or reseller for each of the product quoted. An authorization letter should accompany your quote for each product quoted; otherwise it may lead to rejection.
16. The delivery period and other terms should be clearly mentioned.
17. Eligibility: Quotation from registered firms/company's / manufacturer under TNGST/CST / other statutory bodies alone be considered. Any Manufacturer / Supplier / Dealer who has been declared ineligible by World Bank/government of India shall not be eligible to participate in this bid. Any fraudulent practices including concealing of facts at the time of submission of bid and there after shall lead to disqualification. List of beneficiaries especially from Educational Institutions / R & D Institutions should also be enclosed with the quotations.
18. For those instruments Cost exceeding 5,00,000/- the company should have (i) Three similar works, each of value not less than 40% of the estimated cost put to tender, or (ii) Two similar works, each of value not less than 50% of the estimated cost, or (iii) One similar work of value not less than 80% of the estimated cost, all amounts rounded off to a convenient full figure, in the last 7 years ending on the last day of the month previous to the one in which the tenders are invited.
19. Complete user, technical and service documentation, and spare parts catalogue are to be provided along with the supply of the item.
20. The vendors are informed that they should not call us over phone or contact us in person. All clarifications can be obtained through E-Mail/FAX/Post. Vendors shall not make attempts to establish unsolicited and un-authorized contact with us after the opening of the offers and prior to the notification of the award. Any attempt by any vendor to bring to bear extraneous pressures on us shall be sufficient reason to disqualify the vendor.
21. Delay / loss in postal transit or due to other reasons will not be NIT-T's responsibility.
22. We are not responsible for accidental opening of the covers that are not properly super scribed and sealed before the time scheduled for opening.
23. The tender should be made only on the "Technical compliance form" & "Quotation form" which is available in our website, otherwise it shall lead to rejection. The technical compliance form & PRICE BID FORM should be duly filled up (preferably **TYPE WRITTEN IN CAPITAL LETTERS**) and should clearly mention the features offered by the bidder against each specification.
24. Authorized signatory should sign on all the pages. Bids without authorized signatures will be rejected.
25. The manufacturers of the quoted make of the product must be of national / international repute and having ISO /BIS certificate.
26. **Liquidated damages:** If the bidder/supplier, after accepting the Purchase Order, fails to deliver any or all of the Goods within the period specified in the Order, NIT-T shall, without prejudice to its other remedies under the Rules of Purchase, proceed to cancel the order or agree to accept a delayed delivery on the condition of payment of liquidated damages by the bidder / supplier a sum equivalent to 0.50% of the total cost as indicated in the Purchase Order (which will be deemed as agreed price) for each week or part thereof of delay until actual delivery or performance is completed and such penal charges shall be limited to a maximum of 5% of the total cost. Once the maximum is reached NIT-T may proceed on its own to consider the termination / cancellation of the order.
27. **The vendors are informed that they should sign a stamp paper agreement with us, for Warranty, AMC, etc. before placing the final purchase order as per our terms & conditions and 5% -10% of purchase order value in the form of bank guarantee towards performance security. The bank guarantee will be returned to the supplier after the successful completion of supply, installation, and the warranty period.**
28. **The bidders are required to quote for all the items.**
29. **The bidders who quote for only some of the items would be disqualified.**
30. The bidders may procure the items from different manufacturers but should take the responsibility of demonstrating the compatibility before the submission of the bid.
31. Failure to comply with all the terms and conditions mentioned herein would result in the tender being summarily rejected.

32. Vendors are informed that once the companies are shortlisted based on the technical specification, only then the price bids of the firms that meet NIT-T's Technical specification / requirements would be compared.
33. The order will be based on the actual requirement at the time of ordering, optional items may also be ordered based on the actual requirements at the time of ordering. Not quoting for this may result in disqualification.
34. NIT-T reserves the right to modify or alter the specifications after short listing of tenderers.
35. NIT-T reserves the right to change the order quantity or split the orders among multiple vendors without assigning any reason(s) whatsoever.
36. NIT-T reserves the right to reject any or all the tenders without assigning any reasons whatsoever.
37. NIT-T reserves the right to purchase decreased number of quantity of the item to be purchased
38. The agencies should submit their rate as per the format given in Section 4 of the Notice Inviting Tender in this cover. All the pages of the bid should be signed affixing the seal. All corrections and overwriting should be initialed.
39. The tender will be acceptable only from the manufacturers or its authorized supplier.
40. The bid shall be in the format of price schedule given in Section 4. The contract form as per format given in section 5 shall be submitted. Incomplete or conditional tender will be rejected.
41. Details of quantity and the specifications are mentioned in Section 3 appended to this Notice Inviting Tender
42. The item to be used is strictly according to the specification and subject to test by the Institute/concerned authorities. It must be delivered and installed in good working condition.
43. The Contractor/Supplier shall have no claim to any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the work/supply in full but he did not derive in consequence of the foreclosure of the whole or part of the works.
44. In case of dispute, the matter will be subject to Tiruchirappalli, Tamil Nadu Jurisdiction only.

**Release of EMD:** The EMD shall be released after receipt of performance security from successful bidder.

**Validity of bids:** The rate quote should be valid for a minimum of 120 days. No claim for escalation of rate will be considered after opening the Tender.

**Imports:** In case, goods are to be imported, the Indian agent should furnish authorization certificate by the principles abroad for submission of the bid in response to this Notice Inviting Tender.

**Clarification of Tender Document:** A prospective bidder requiring any clarification of the Tender document may communicate to the contact person given in this notice inviting tender.

**Amendment of tender document:** At any time prior to the last date of receipt of bids, Institute may for any reason, whether at its own initiative or in response to a clarification requested by prospective bidder, modify the Tender document by an amendment.

***The Institute may at its own discretion extend the last date for the receipt of bids.***

The bids shall be written in English language and any information printed in other language shall be accompanied by an English translation, in which case for the purpose of interpretation of the bid, the English translation shall govern.

The Institute reserves the right of accepting any bid other than the lowest or even rejecting all the bids without assigning any reasons therefor. The decision of the Institute Purchase Committee is final in all matters of tender and purchase.

The bidder should give the following declaration while submitting the Tender.

## ACCEPTANCE

We accept the above terms and conditions and shall comply with them strictly.

**NAME OF THE VENDOR:**

**ADDRESS :**

### **“DETAILS OF THE FIRM OFFERING THIS QUOTE”**

**(Write or print or type in block letters and please answer all the questions)**

1. Name of the firm?

2. Date of incorporation?

3. Nature of the company - Government / Public / Private Company / Partnership / Proprietorship:

4. Specify the number of years in this line of activity by the Company :.

5. Quantity of sales in the last three years for the “.....” (same model that you have quoted)?

2009-2010	2010-2011	2011-2012

6. Turn over in the last three years (Figures should be in Indian Rupees in Lakhs):

2009-2010	2010-2011	2011-2012

7. Provide the postal address, telephone & fax numbers, and email address of the nearest service center.

8. A) Number of service engineers in the above location trained on the product quoted along with their educational qualification, certification and designation (applicable only for instruments) and B) Assured response time for service calls in hours:

A)

B)

9. What would be the delivery period in days from the date we place an official purchase order.

10. Enclose the list of customers to whom you have supplied “the multiparty conferencing system ” during the last 3 years ending 31/03/2012 with full postal address and name of the contact person with phone, FAX numbers, and E-Mail id. Certificate regarding satisfactory performance of the “the multiparty conferencing system” from the minimum three end users should be furnished.

11. Are you the authorized dealer or distributor or reseller for the products quoted:

12. Have you supplied “**the multiparty conferencing system.**” to National Institute of Technology, Tiruchirappalli in the last 3 years? If yes, specify the quantity supplied in the last 3 years and last PO reference

13. Was there any elapse or delay in supplying the goods ordered or any service related issue during the warranty period for the products ordered by NIT-T with your firm? If yes, provide details.

14. On Manufacturer’s Side to whom NITT have to contact in case of delayed supply and other issues committed by the authorized dealer / distributor / reseller :

Contact Person Name :	
Address :	
E-mail ID :	Telephone / Cell Phone :

**DECLARATION**

I/we have not tampered/modified the tender forms in any manner. In case, if the same is found to be tampered/modified, I/we understand that my/our tender will be summarily rejected and full Earnest Money Deposit (EMD) will be forfeited and I/we am/are liable to be banned from doing business with NIT, Trichy and /or prosecuted.

**Signature of the Bidder** : .....

**Name and Designation** : .....

**Business Address** : .....  
.....  
.....

**Place :**

**Date :**

**Seal of the Bidder’s Firm**

## SECTION : 3 SCHEDULE OF REQUIREMENTS, SPECIFICATIONS AND ALLIED DETAILS

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Name of the Component to be procured : **The multiparty conferencing system**

*Specification for*

Name of the Component to be procured : **The multiparty conferencing system**

Specifications : List attached in Section 6

Quantity : One

Any other details/requirement : Optional accessories - List attached

Warranty period required : One year or more

Delivery schedule expected after  
release of purchase order (in weeks) : 1 month

EMD (in Rupees) : **Rs. 14,000**

**SECTION : 4 PRICE SCHEDULE**

[ To be used by the bidder for submission of the bid ]

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- 1. Component Name :
  
- 2. Specifications (confirming to Section 3 of Tender document-enclose additional sheets if necessary) :
- 3. Currency and Unit Price(excluding Taxes) :
- 4. Quantity :
  
- 5. Item cost (Sl.No.3 & Sl.No.4) (in Indian Rupee) :
  
- 6. Taxes and other charges :
  - (i) Specify the type of taxes and duties in percentages and also in figures
  - (ii) Specify other charges in figures :
  
- 7. Warranty period (confirming to the Section 3 of Tender document. This should be mentioned in Technical bid also in order to get qualified for Financial bid) :
- 8. Delivery Schedule (confirming to the Section 3 of Tender document) :
- 9. Name and address of the firm for placing purchase order :
  
- 10. Name and address of Indian authorized agent (in case of imports only) :

**Signature of the Bidder** : .....

**Name and Designation** : .....

**Business Address** : .....  
.....  
.....

**Place :**

**Date :**

**Seal of the Bidder's Firm**

**SECTION : 5 CONTRACT FORM**

[ To be provided by the bidder in the business letter head ]

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1. {Name of the Supplier's Firm) hereby abide to deliver the **the multiparty conferencing system** by the delivery schedule mentioned in the Section 3 tender document for supply of the items if the purchase order is awarded.
2. The item will be supplied conforming to the specifications stated in the tender document without any defect and deviations.
3. Warranty will be given for the period mentioned in the tender document and service will be rendered to the satisfaction of NIT, Trichy during this period.

**Signature of the Bidder** : .....

**Name and Designation** : .....

**Business Address** : .....  
.....  
.....

**Place :**

**Date :**

**Seal of the Bidder's Firm**

## SECTION: 6: SPECIFICATIONS OF THE MULTIPARTY CONFERENCING SYSTEM

### 1. Multipoint HD Video Conferencing System to support 4 Desktop based Endpoints connected at the same time.

<b>Multipoint System: 4 ports on one server in IP @ 4Mbps or more on each port with Adaptation on each port (frame rate matching &amp; resolution matching), CP and VA Layouts with 1080p or higher resolution for each and every port.</b>	
<b>1.1 Users and Conference Management</b>	
Multipoint Server	This appliance should provide a centralized, web based, simple, enterprise-wide conference and user management. It includes a web server, Database and should be based on a hardened operating system.
Network Support	10/100 Mbps / 1Gbps interface
Real-time conference management	<ul style="list-style-type: none"> <li>• Operators should quickly and easily take control of a running conference and modify the following parameters:               <ul style="list-style-type: none"> <li>• Conference URL for Guest Web Access</li> <li>• Setting a PIN for the Conference</li> <li>• Lock/Unlock of the Conference</li> <li>• Mute/Unmute for audio and video streaming from all or selected participants</li> <li>• Disconnection of all or selected Participants</li> </ul> </li> </ul>
Users	System should support registration of upto 50 users. System should support a total of 4 concurrent Endpoints to be connected in either point to point or multi-point calls.
No. of simultaneous calls recorded	It should be possible to establish 1-2 parallel calls and it should be possible to record each and every call for playing back later. Typically This would be used for lectures delivered by 2 teachers in parallel for students located in two different class rooms. Each teacher should be able to start, pause, resume and stop the recording of the lectures at the click of a button
<b>1.2 Device Management</b>	
Centralized control of users	Centralized Registration and access control of all users via an easy to use web interface The administrator need to be able to perform group based provisioning to set restrictions on the Personal Meeting Room like: Maximum Number of Participants Maximum Upstream and Downstream Bandwidth
Centralized control of video conferencing network	<ul style="list-style-type: none"> <li>• Automatic software updates to networked video devices and Software clients to ensure hassle-free system upgrades.</li> </ul> <p>For the PC Based Clients: there should be the possibility to rollout new versions based on the Operating Systems (Windows, Optional: Mac, Linux)</p> <p>For Mobile Clients: the client should be downloadable on iOS and/or android based mobile devices</p> <p>For the Room systems: there should be the possibility to rollout new versions based on the model</p>
Comprehensive directory services	<ul style="list-style-type: none"> <li>• Real-time monitoring and remote network management insures video conferencing network integrity and helps minimize network downtime</li> <li>• Dialing is as simple as pushing a button with the user-centric Global Directory</li> </ul>
<b>1.3 Router/Bridge/MCU Functionality</b>	
High Performance Platform	The central server/MCU ( <b>which includes both hardware and software</b> ) should support 20 or more HD (1080p or higher) ports, with full rate & resolution matching, without any hardware upgrade

Capacity	<p>The MULTIPOINT solution should support 2 concurrent calls on IP up to 4 Mbps or more on each port with full rate &amp; resolution matching.</p> <p>It should support soft end points for Windows, (Optional::MAC, Linux, IOS &amp; Android licensed from the same OEM, Room Based system with Codec, PTZ Camera &amp; Telepresence Systems from day one.</p>
Video Support	<ul style="list-style-type: none"> <li>• H.264 SVC or higher</li> <li>• Up to 1080p or higher on all ports</li> <li>• 16:9 aspect ratio</li> <li>• Content sharing support</li> </ul>
Audio Support	<ul style="list-style-type: none"> <li>• 16 KHz or better audio</li> <li>• User managed mute control</li> <li>• In band DTMF support</li> </ul>
Management Tools	<p>Web-based management</p> <ul style="list-style-type: none"> <li>• Administrator and operator views</li> <li>• On board shelf management monitors and maintains hardware elements</li> </ul>
Network Support	<ul style="list-style-type: none"> <li>• Network Interface supporting 10/100 Mbps / 1Gbps interface</li> <li>• Upto 4 Mbps conference data rates</li> <li>• Support in built NAT traversal</li> </ul>
Rate & Resolution Matching	<ul style="list-style-type: none"> <li>• Low latency (&lt;20ms per server)</li> <li>• Resolution Matching</li> <li>• Frame rate Matching</li> </ul>
Security	<ul style="list-style-type: none"> <li>• It is required to be able to protect the Conferences by: <ul style="list-style-type: none"> <li>• Setting a Pin</li> <li>• Locking the Conference Users, and not only Administrators, need to be able to perform these actions via a Web Interface.</li> </ul> </li> <li>• GUI user authentication</li> </ul>
Conferencing Highlights	<ul style="list-style-type: none"> <li>• Personal layout, automatic and dynamic layouts, , Far-end camera control (FECC), Conference dial out and dial in</li> </ul>
GUI Permission Levels	<p>Three levels -</p> <p>Chair (user) Person – can start and manage a conference</p> <p>Operator – can manage conference and monitor the bridge (i.e. can see the device tree and the alarms)</p> <p>Admin – can manage conferences, configure, and monitor the bridge</p>
Integration	<p>Should be able to support to work H.323 and SIP devices either directly or via optional gateway</p>
Hardware Monitoring	<p>Control function to monitor the condition of the server via SNMP</p>
Application Highlights	<p>This system should Integrate with LDAP for automated user authentication against any LDAP Server or Microsoft Active Directory</p>
Intelligent Dialing	<p>This system should have provision for initiating a call from a video endpoint as easy as joining a web conference</p>
Integrated CDR Reporting	<p>Call Detail Records include parameters necessary to evaluate network utilization and facilitate charge-back billing.</p> <p>Report data can be exported for use in third-party applications like the Microsoft Office or OpenOffice Suites</p>
3rd Party Product Support	<p>This solution should have provision to support connectivity to H.323 based 3rd party IP endpoints, gateways, MCUs and gatekeepers, either directly or via a gateway in future.</p>
Accessories	<p>With all required connecting cables and accessories</p>

## 2. PC based Video conference Software

<i>Parameter</i>	<b>Required Specifications</b>
Platform Support	The desktop application must run on Windows XP, Windows Vista, Windows 7, (optional: Mac OSX & Linux)
BANDWIDTH	The software should support encoding up to 2 Mbps with 720P-30 and decoding up to 2 Mbps including the support for 1440p
VIDEO STANDARDS	H.264 SVC or higher
USER INTERFACE	<ul style="list-style-type: none"> <li>• The system should provide an easy to use install wizard when the client is first installed.</li> <li>• Dual monitor view must be supported for laptops or desktops using 2 screens</li> </ul>
BOTH NEAR AND FAR SITE VIDEO ON ONE MONITOR	<ul style="list-style-type: none"> <li>• It should be possible to see both the near and far site on One Screen thus making most efficient use of a single display area.</li> <li>• The preview should support both the Picture in Picture layout or appear as one of the participants of the conference.</li> </ul>
VIDEO INPUTS	The application should support standard USB Cameras which can be changed or switched on the fly.
AUDIO STANDARDS	<ul style="list-style-type: none"> <li>• The system should support Superior wideband audio of crystal clear audio</li> <li>• The application should support standard USB headsets or Microphones which can be changed or switched on the fly.</li> </ul>
AUDIO FEATURES	<ul style="list-style-type: none"> <li>• Should support Audio error concealment which Reduces audio drop-out on busy IP networks and smooth, consistent verbal communications without interruptions</li> </ul>
EMBEDDED ENCRYPTION (Optional)	<ul style="list-style-type: none"> <li>• The system should support 128 bit AES encryption</li> <li>• The system should support Secure password authentication</li> <li>• The system should have a unique factory default password</li> <li>• The system should support administrative password; dial-in meeting password should be supported. Encrypted password for Web UI should be supported.</li> </ul>
COLLABORATION OPTIONS	<p>It should be possible to share any application active on the computer or the entire screen. In a multiscreen setup the user should be able to select which is the screen that will be shared among the ones currently connected/active.</p> <p>It should be possible to view any shared application or screen by any other party via a simple button</p> <p>Each user, either in a Point to Point or multipoint, should be able to share at the same time.</p> <p>Every participant should be able to decide if they want to display a shared application/screen or not and from which Participant in the conference</p>
NETWORK FEATURES	<ul style="list-style-type: none"> <li>• The proposed system should support Audio Error Concealment</li> <li>• Packet and jitter control</li> <li>• Network Address Translation (NAT) support</li> <li>• Automatic NAT discovery</li> <li>• Asymmetric speed control</li> <li>• Fixed-Port TCP-Based Tunneling Protocol for firewall traversal support engaged automatically by the client whenever the network setup/condition requires.</li> </ul>

ETHERNET / INTERNET / INTRANET CONNECTIVITY	<p>Desktop should run on any IP networks ranging from 3G+, A/S-DSL, T1, and Ethernet..., in either full TCP or TCP/UDP mixed modes.</p> <p>NAT and Firewall traversal should be an integral part of the solution allowing automatic fallback to a TCP Based tunneling to overcome network restrictions.</p> <p>Such a tunneling should also be possible via Web Proxies</p>
Usability	The application must be very easy to use; calling other parties should be extremely simple and intuitive.
SYSTEM MANAGEMENT	<p>The Desktop application must be centrally deployable</p> <p>Upgrade must be automatic</p> <p>Desktop sessions can be started from a Web Based Portal application.</p>
DIRECTORY SERVICES	The desktop should be able to authenticate either through a DB or an LDAP directory with support for Secure LDAP too.
Multipoint features	The Desktop application, should be able to join both Multipoint and Point to point calls, ranging from audio only to HD multipoint
Interoperability	The Desktop must be able to reach both SIP, H.323 and Other room systems seamlessly from a web based interface either directly or via optional Gateway.
AUTOMATICALLY ANSWER INCOMING CALLS and Automatic Full Screen Mode.	<p>The system should be able to auto answer calls regardless of what page the user is on at the time.</p> <p>The user should be able to set the software to automatically switch to full screen mode when a call is answered manually or automatically.</p>

### **3. Mobile Software Client for Smart phone / Tablet**

Parameter	Required Specifications
Video Standards	H.264 SVC or higher
Audio Standards	SPEEX Wideband Audio, up to 32 Khz sampling rate
Live Resolutions	<p>Based on the Capacity of the Device</p> <ul style="list-style-type: none"> <li>● Transmitting : Up to 480 x 270</li> <li>● Receiving: Up to HD 720p</li> </ul>
Encryption	AES , TLS, SRTP, HTTPS
Firewall and Nat Traversal	Inbuilt NAT/Firewall Traversal Mechanism
Supported Operating Systems	<p>The application has to support the following platforms:</p> <ul style="list-style-type: none"> <li>● Apple IOS: <ul style="list-style-type: none"> <li>○ Ipod Touch</li> <li>○ Iphone 4 or later</li> <li>○ Apple Ipad 2 or later</li> </ul> </li> <li>● Google Android</li> </ul>

### **OPTIONAL ITEMS:**

#### **4. USB HD PTZ Camera for Desktop Users**

USB based HD Web Camera and necessary software drivers for Windows XP/Vista/Windows 7 to support live video capture at 720p at 30 frames per second. Optical zoom 10X or higher, PAN 360 degrees

#### **5. PTZ camera with S Video output and USB capture card**

PTZ ¼" CCD camera with 500-570 TVL resolution/640X480 resolution, optical zoom 10X or higher, 360 degrees zoom, 180 degrees tilt, S video output along with S video to USB capture card camera

## 6. USB Desktop Hands free Microphone for Desktop Users

USB based hands free Microphone and Speaker Device having embedded DSP and built-in Echo cancellation, Noise cancellation, De-Reverb, Microphone Mute/Un-mute and Volume Control buttons for full Duplex Audio and hands free operation. It should have built-in ringer and good pickup of audio for normal conversation even from a distance of 8 feet.

### COMPLIANCE FORM

#### Multipoint HD video conferencing system to support 4 desktop based endpoints connected at the same time.

Parameter	NIT'T Specification	Company Specification	Reason for Difference
<b>USERS AND CONFERENCE MANAGEMENT</b>			
➤ <b>Multipoint System</b>	4 ports on one server in IP @ 4Mbps or more on each port with Adaptation on each port (frame rate matching & resolution matching), CP and VA Layouts with 1080p or higher resolution for each and every port.		
➤ <b>Multipoint Server</b>	This appliance should provide a centralized, web based, simple, enterprise-wide conference and user management. It includes a web server, Database and should be based on a hardened operating system.		
➤ <b>Network Support</b>	10/100 Mbps / 1Gbps interface		
➤ <b>Real-time conference management</b>	Operators should quickly and easily take control of a running conference and modify the following parameters: <ul style="list-style-type: none"> <li>• Conference URL for Guest Web Access</li> <li>• Setting a PIN for the Conference</li> <li>• Lock/Unlock of the Conference</li> <li>• Mute/Unmute for audio and video streaming from all or selected participants</li> <li>• Disconnection of all or selected Participants</li> </ul>		

➤ <b>Users</b>	System should support registration of upto50 users. System should support a total of 4 concurrent Endpoints to be connected in either point to point or multi-point calls.		
➤ <b>No.of simultaneous calls recorded</b>	It should be possible to establish 1-2 parallel calls and it should be possible to record each and every call for playing back later. Typically This would be used for lectures delivered by 2 teachers in parallel for students located in two different class rooms. Each teacher should be able to start, pause, resume and stop the recording of the lectures at the click of a button		
<b>DEVICE MANAGEMENT</b>			
➤ <b>Centralized control of users</b>	Centralized Registration and access control of all users via an easy to use web interface The administrator need to be able to perform group based provisioning to set restrictions on the Personal Meeting Room like: Maximum Number of Participants Maximum Upstream and Downstream Bandwidth		
➤ <b>Centralized control of video conferencing network</b>	<ul style="list-style-type: none"> <li>• Automatic software updates to networked video devices and Software clients to ensure hassle-free system upgrades.</li> </ul> <p>For the PC Based Clients: there should be the possibility to rollout new versions based on the Operating Systems Windows, Optional Mac, Linux)</p> <p>For Mobile Clients: the client should be downloadable on iOS and/or android based mobile devices</p>		

	For the Room systems: there should be the possibility to rollout new versions based on the model		
➤ <b>Comprehensive directory services</b>	• Dialing is as simple as pushing a button with the user-centric Global Directory		
<b>Router/Bridge/MCU Functionality</b>			
➤ <b>High Performance Platform</b>	The central server/MCU (which includes both hardware and software) should support 20 or more HD (1080p or higher) ports, with full rate & resolution matching, without any hardware upgrade		
➤ <b>Capacity</b>	The MULTIPOINT solution should support 2 concurrent calls on IP up to 4 Mbps or more on each port with full rate & resolution matching.  It should support soft end points for Windows, (Optional: MAC, Linux) IOS & Android licensed from the same OEM, Room Based system with Codec, PTZ Camera & Telepresence Systems from day one.		
➤ <b>Video Support</b>	<ul style="list-style-type: none"> <li>• H.264 SVC or higher</li> <li>• Up to 1080p or higher on all ports</li> <li>• 16:9 aspect ratio</li> <li>• Content sharing support</li> </ul>		
➤ <b>Audio Support</b>	<ul style="list-style-type: none"> <li>• 16 KHz or better audio</li> <li>• User managed mute control</li> <li>• In band DTMF support</li> </ul>		
➤ <b>Network Support</b>	<ul style="list-style-type: none"> <li>• Network Interface supporting 10/100 Mbps / 1Gbps interface</li> <li>• Upto 4 Mbps conference data rates</li> <li>• Support in built NAT traversal</li> </ul>		

<p>➤ <b>Rate &amp; Resolution Matching</b></p>	<ul style="list-style-type: none"> <li>• Low latency (&lt;20ms per server)</li> <li>• Resolution Matching</li> <li>• Frame rate Matching</li> </ul>		
<p>➤ <b>Security</b></p>	<p>It is required to be able to protect the Conferences by:</p> <ul style="list-style-type: none"> <li>• Setting a Pin</li> </ul> <p>Locking the Conference Users, and not only Administrators, need to be able to perform these actions via a Web Interface.</p> <ul style="list-style-type: none"> <li>• GUI user authentication</li> </ul>		
<p>➤ <b>Conferencing Highlights</b></p>	<ul style="list-style-type: none"> <li>• Personal layout, automatic and dynamic layouts, , Far-end camera control (FECC), Conference dial out and dial in</li> </ul>		
<p>➤ <b>GUI Permission Levels</b></p>	<p>Three levels -</p> <p>Chair (user) Person – can start and manage a conference</p> <p>Operator – can manage conference and monitor the bridge (i.e. can see the device tree and the alarms)</p> <p>Admin – can manage conferences, configure, and monitor the bridge</p>		
<p>➤ <b>Integration</b></p>	<p>Should be able to support to work H.323 and SIP devices either directly or via optional gateway</p>		
<p>➤ <b>Application Highlights</b></p>	<p>This system should Integrate with LDAP for automated user authentication against any LDAP Server or Microsoft Active Directory</p>		
<p>➤ <b>Intelligent Dialing</b></p>	<p>This system should have provision for initiating a call from a video endpoint as easy as joining a web conference</p>		

➤ <b>Integrated CDR Reporting</b>	Call Detail Records include parameters necessary to evaluate network utilization and facilitate charge-back billing.  Report data can be exported for use in third-party applications like the Microsoft Office or OpenOffice Suites		
➤ <b>3rd Party Product Support</b>	This solution should have provision to support connectivity to H.323 based 3rd party IP endpoints, gateways, MCUs and gatekeepers, either directly or via a gateway in future.		
➤ <b>Accessories</b>	With all required connecting cables and accessories		

### **PC based Video conference Software**

<i>Parameter</i>	<b>NIT'T Specifications</b>		
➤ <b>Platform Support</b>	The desktop application must run on Windows XP, Windows Vista, Windows 7, (optional: Mac OSX & Linux )		
➤ <b>BANDWIDTH</b>	The software should support encoding up to 2 Mbps with 720p-30 and decoding up to 2 Mbps including the support for 1440p		
<b>29. VIDEO STANDARDS</b>	H.264 SVC or higher		
<b>30.USER INTERFACE</b>	<ul style="list-style-type: none"> <li>• The system should provide an easy to use install wizard when the client is first installed.</li> <li>• Dual monitor view must be supported for laptops or desktops using 2 screens</li> </ul>		
<b>31. BOTH NEAR AND FAR SITE VIDEO ON ONE MONITOR</b>	<ul style="list-style-type: none"> <li>• It should be possible to see both the near and far site on One Screen thus making most efficient use of a single display area.</li> <li>• The preview should support both the Picture in Picture layout or</li> </ul>		

	appear as one of the participants of the conference.		
<b>32. VIDEO INPUTS</b>	The application should support standard USB Cameras which can be changed or switched on the fly.		
<b>33. AUDIO STANDARDS</b>	<ul style="list-style-type: none"> <li>• The system should support Superior wideband audio of crystal clear audio</li> <li>• The application should support standard USB headsets or Microphones which can be changed or switched on the fly.</li> </ul>		
<b>34. AUDIO FEATURES</b>	<ul style="list-style-type: none"> <li>• Should support Audio error concealment which Reduces audio drop-out on busy IP networks and smooth, consistent verbal communications without interruptions</li> </ul>		
<b>35. EMBEDDED ENCRYPTION (Optional)</b>	<ul style="list-style-type: none"> <li>• The system should support 128 bit AES encryption</li> <li>• The system should support Secure password authentication</li> <li>• The system should have a unique factory default password</li> <li>• The system should support administrative password; dial-in meeting password should be supported. Encrypted password for Web UI should be supported.</li> </ul>		
<b>36. COLLABORATION OPTIONS</b>	<p>It should be possible to share any application active on the computer or the entire screen. In a multiscreen setup the user should be able to select which is the screen that will be shared among the ones currently connected/active.</p> <p>It should be possible to view any shared application or screen by any other party via a</p>		

	<p>simple button</p> <p>Each user, either in a Point to Point or multipoint, should be able to share at the same time.</p> <p>Every participant should be able to decide if they want to display a shared application/screen or not and from which Participant in the conference</p>		
<b>37. NETWORK FEATURES</b>	<ul style="list-style-type: none"> <li>• The proposed system should support Audio Error Concealment</li> <li>• Packet and jitter control</li> <li>• Network Address Translation (NAT) support</li> <li>• Automatic NAT discovery</li> <li>• Asymmetric speed control</li> <li>• Fixed-Port TCP-Based Tunneling Protocol for firewall traversal support engaged automatically by the client whenever the network setup/condition requires.</li> </ul>		
<b>38. USABILITY</b>	<p>The application must be very easy to use; calling other parties should be extremely simple and intuitive.</p>		
<b>39. SYSTEM MANAGEMENT</b>	<p>The Desktop application must be centrally deployable</p> <p>Upgrade must be automatic</p> <p>Desktop sessions can be started from a Web Based Portal application.</p>		
<b>41. DIRECTORY SERVICES</b>	<p>The desktop should be able to authenticate either through a DB or an LDAP directory with support for Secure LDAP too.</p>		
<b>42. MULTIPOINT FEATURES</b>	<p>The Desktop application, should be able to join both Multipoint and Point to point calls, ranging from audio only to HD multipoint</p>		

43. <b>INTEROPERABILITY</b>	The Desktop must be able to reach both SIP, H.323 and Other room systems seamlessly from a web based interface either directly or via optional Gateway.		
44. <b>AUTOMATICALLY ANSWER INCOMING CALLS AND AUTOMATIC FULL SCREEN MODE.</b>	The system should be able to auto answer calls regardless of what page the user is on at the time.  The user should be able to set the software to automatically switch to full screen mode when a call is answered manually or automatically.		

**MOBILE SOFTWARE CLIENT FOR SMART PHONE / TABLET**

<b>Parameter</b>	<b>NIT-T Specifications</b>		
45. <b>VIDEO STANDARDS</b>	H.264 SVC or higher		
46. <b>AUDIO STANDARDS</b>	SPEEX Wideband Audio, up to 32 Khz sampling rate		
47. <b>LIVE RESOLUTIONS</b>	Based on the Capacity of the Device <ul style="list-style-type: none"> <li>• Transmitting : Up to 480 x 270</li> <li>• Receiving: Up to HD 720p</li> </ul>		
48. <b>ENCRYPTION</b>	AES , TLS, SRTP, HTTPS		
49. <b>FIREWALL AND NAT TRAVERSAL</b>	Inbuilt NAT/Firewall Traversal Mechanism		
50. <b>SUPPORTED OPERATING SYSTEMS</b>	The application has to support the following platforms: <ul style="list-style-type: none"> <li>• Apple IOS: <ul style="list-style-type: none"> <li>○ Ipod Touch</li> <li>○ Iphone 4 or later</li> <li>○ Apple Ipad 2 or later</li> </ul> </li> <li>• Google Android</li> </ul>		
<b>OPTIONAL ITEMS</b>			
51. <b>USB HD PTZ CAMERA FOR DESKTOP USERS</b>	USB based HD Web Camera and necessary software drivers for Windows XP/Vista/Windows 7 to support live video		

	capture at 720p at 30 frames per second. Optical zoom 10X or higher, PAN 360 degrees		
<b>52. PTZ CAMERA WITH S VIDEO OUTPUT AND USB CAPTURE CARD</b>	PTZ 1/4" CCD camera with 500-570 TVL resolution/640X480 resolution, optical zoom 10X or higher, 360 degrees zoom, 180 degrees tilt, S video output along with S video to USB capture card camera		
<b>53. USB DESKTOP HANDS FREE MICROPHONE FOR DESKTOP USERS</b>	USB based hands free Microphone and Speaker Device having embedded DSP and built-in Echo cancellation, Noise cancellation, De-Reverb, Microphone Mute/Unmute and Volume Control buttons for full Duplex Audio and hands free operation. It should have built-in ringer and good pickup of audio for normal conversation even from a distance of 8 feet.		