RURAL ELECTRIFICATION CORPORATION LIMITED
IT Division
CORPORATE OFFICE

TENDER NO: REC/IT/93(S)/05/-ERP/SERVER/1 DATED 19th JANUARY, 2008

Supply, Installation, Configuration, Testing, Commissioning, Training, Maintenance and System Integration of Servers, various Equipments and/or Products and on-site Facilities Management for ERP at RECL, Corporate Office, Core 4, Scope Complex, Lodi Road, New Delhi – 110 003

PRE-BID CLARIFICATION/MODIFICATION

The following is the clarifications/modifications of the above tender after the pre-bid session held on 23.01.2008. This will be treated as a part of the original RFP.

TECHNICAL:

SL No	Relevant Clause	Clarifications/ modifications sought for	Clarifications/modifications by RECL
1	3.23.6 (IX) Pg. 42	Provision for a standby server within 2 weeks of raising purchase order	The clause to be re-read as "The bidder should provide and install standby server within 1 week of raising purchase order .."
	Annexure-K		
2	Required H/W specification (Serial 1-7) Internal Disk (RISC/EPIC) Pg 97 – 103	All the servers mentioned in Annexure K (Technical Specifications) mention SCSI/ FC-AL disks. SAS is the latest technology available in HDD, and maximum RPM speed is 10K. Results show that 10K SAS provides better or equal to SCSI 15K rpm. Suggest vendors be allowed to quote servers with SAS drives also.	The clause should be re-read as "3 * 146 GB (15 K SCSI/FC-AL **OR** 10 K SAS/FC-AL) disks"
3	Required OS specification (Serial 1-7) (RISC/EPIC) Pg 97-103	Suggested to include: "Need to offer enterprise or mission critical category of OS which ever is higher with RISC and RISC/EPIC Servers, in case multiple category of OS are available" This will be helpful for better manageability and monitoring.	The following additional clause is introduced "The bidder should offer latest mission critical version of OS which is capable of running oracle based ERP (version 11i or above) application. Documentary proof on same to be submitted."
4	QA DB server Sl no 3 Processor Pg No.99	In QA Database Server SpecJBB benchmark is mentioned. Request it be changed to SpecJBB 2005 as in Production Server.	The clause should be re-read as "Estimated Spec JBB 2005 40000 per server, should be supported by 3rd party audited

			benchmark results"
5	Required H/W specification Application Servers. Processor. (Sl-1 & 4) "jops" Pg 97, 100	In all the servers where jops benchmark is mentioned, please mention which benchmark it refers to. We request it should refer to the SPECjAppServer 2004 benchmark, which is the latest available to date.	The benchmark refers to SPECjAppServer benchmark.
6	Serial No. 2 : Production Database Server. Processor. Pg : 98	Request to change the SpecJbb2005 rating in the Production DB (Page 98) to 100,000 upgradeable to 190,000 in equivalence to 100,000 tpmc upgradeable to 190,000 tpmc as asked. This is also in conjunction with the tpmc & specjbb2005 results, asked for other RISC servers.	No change
7	Serial No. 6 : Discoverer Server. Processor. Pg : 102	Request to change the SpecJbb2005 rating in the Discoverer Server to 50,000 in equivalence to 50,000 tpmc as asked. This is also in conjunction with the tpmc & specjbb2005 results, asked for other RISC servers.	No change
8	(Sl-1 to 7) Application servers (Prod & QA) – Processor. 3rd Party audited benchmark results for RISC servers Page-97-103	In case the stated 3rd party audited benchmark results in RISC servers not available, then request to allow OEM lab certificate or reference 3rd party in place of 3rd party audited benchmark results.	No change
9	I/O subsystem (RISC/EPIC servers) Serial no.1-7 Page-97-103	DVD ROM – Drive , keyboard mouse & 2 * 4 GB Fiber channel HBA adapter These classes of servers are designed for remote monitoring or KVM connect. Request to remove keyboard and mouse requirement.	Clause should be re-read as "DVD ROM – Drive & 2 * 4 GB Fiber channel HBA adapter"
10	Serial 1 & 3 RISC server Page – 97, 99	HBA card not required on application server, as per tender, and so server will not attach with storage	No Change
11	Serial 2 & 3 RISC/EPIC Data base Servers	All server should be RISC based server but as per tender document ask EPIC options in Production database server and a database server, when all the vendors have RISC	No change

	Page – 98,99	server, EPIC should be removed from specification	
12	Serial 1 to 7 (RISC/EPIC Servers) – Internal disk Page-97-103	An internal disks are required for OS and application only , rest of the data will be at SAN storage , request you to change the no. of drives to two	No change
13	Serial No. 11 & 8: LDAP Server/Backup Server. SL.4-Slots Pg No:104	In LDAP Server/ Backup Server; request that the number of slots should be changed to minimum 3 PCI-E slots; 2 would be required for HBA connection to storage, 1 would be free as per requirement mentioned in RFP. Also PCI-E is the latest in PCI technology which is being adopted by all vendors.	The clause to be re-read as "Minimum 3 nos. of 64-bit Active PCI-E or PCI-X Slots with at least one free slot"
14	Serial No. 11 & 8: LDAP Server/Backup Server SL.16 - "Video" Pg No:104	In LDAP Server/ Backup Server, Request that the option should be ATI Radeon 7000/ on board graphics. Not only is ATI Radeon a proprietary video card, a video card is also not required in the server, as server does not do any graphics intensive work.	The clause to be re-read as "16MB DDR memory and Video should be able to display complex graphics"
15	Serial No. 11 & 8: LDAP/ Backup Server SL.17 - "Power Supply & Fans" Pg No:104	In LDAP Server/ Backup Server, request that the number of cooling fans should not be mentioned as they are according to the cooling requirements of different servers, and do not impact the performance of the server. Instead it should mention redundant fans for cooling.	The clause to be re-read as "Should have redundant Power Supply Units and adequate number of Fans with N + 1 redundancy for cooling"
16	Serial No. 11 & 8: LDAP/ Backup Server SL.11- "Hard disk bays" Pg No:104	In LDAP Server/ Backup Server, request that the Hard Disk Bays be mentioned as: Minimum of 4x3.5" SAS/ 4x2.5" SAS Hot-Swap Hard Disk front accessible bays. Most of the vendors offer 2.5" SAS drives.	The clause to be re-read as "Minimum of 4 x 3.5" SAS **OR** 8 x 2.5" SAS Hot-Swap Hard Disk front accessible bays "
17	Serial No. 11 & 8: LDAP/ Backup Server SL.12 - "Hard disk drives" Pg No:104	In LDAP Server/ Backup Server, request that the Hard Disk Drives be mentioned as 3x146GB 10k Hot-Swappable 2.5" SAS Hard Disk Drives. Most of the vendors have 146 GB SAS drives.	The clause to be re-read as " 3 x 300 GB 15k Hot-Swappable SCSI 3.5" HDD **OR** 6 x 146 GB 10 k Hot-Swappable SAS 2.5" HDD"
18	Serial No.11 & 8 (LDAP/	Keyboard & optical mouse	This clause is deleted.

	BACKUP servers) SL.23 - Input Devices Page-104	These classes of servers are designed for remote monitoring or KVM connect. Request to remove keyboard and mouse requirement.	
19	Serial 11 & 8 LDAP/ Backup server SL.6 – System Management processor Pg-104	IPMI 2.0 Compliance is no more industry standard because so much power management included in the system. Request to remove IPMI 2.0 Compliance.	The clause should be re-read as " "….Graphical user interface & IPMI 2.0 compliance or equivalent features including remote power control"
20	Serial 11 & 8 – LDAP/ Backup server SL.8 - Max Memory Page -104	Max 32 GB (using 4 GB DIMMs for 12 DIMM slots) Request to remove 12 DIMM slots from the clause as 32 GB requirement can be met with 8 DIMM slots	The clause to be re-read as "32 GB (using 4 GB DIMM)"
21	Serial 11 & 8 – LDAP/ Backup server SL.18 – Ports Page - 104	5 USB ports are high for this class of server. Request you to change this to 3 USB 2.0 ports.	The clause to be re-read as "Should have at least 3 nos. of USB 2.0 or more ports ……"
22	Serial No. 9: External SAN Storage Pg : 106	In external SAN Storage, request that the RAID Controller should mention "Dual active End-to-end 4 Gbps design". The latest technology in the industry is 4Gbps technology.	The complete revised External SAN storage specification is given as an annexure to this corrigendum.
23	Serial No. 9: External SAN Storage Pg : 106	In external SAN Storage, request that the Drive Interface should mention "At least 2 no's of 4Gbps FC ports per controller". 4Gbps FC ports would help in achieving end-to-end 4 Gbps connectivity.	
24	Serial No. 9: External SAN Storage Pg : 106	In external SAN Storage, request that the Disk Space should mention "Min 4 TB raw disk space (Using 4Gbps 146GB FC disks, 4 Gbps of 15k rpm in end to end 4Gbps architecture). The total disk space should be extendable up to at least 50 TB". This is to ensure an end – toend 4Gbps architecture.	
25	Serial 12 - External SAN storage – Cache Page - 106	1 GB cache per storage controller is not sufficient with the asked IOPS. Request to change the cache as 2GB per controller from the day	The complete revised External SAN storage specification is given as an annexure to this corrigendum.

		one	
26	Serial 12 - External SAN storage – scalability Page-106	To reduce the disk scalability to 95 disks	The complete revised External SAN storage specification is given as an annexure to this corrigendum.
27	Serial 12 - External SAN storage – Additional features (should support) Page-	Dynamic RAID migration / Virtual LUN migration. When applications are Online. Request to remove the word online.	No change
28	Serial 12 - External SAN storage – Management. Page - 106	The storage system should be supplied with The license shall be provided for both features and for full proposed storage array.	The complete revised External SAN storage specification is given as an annexure to this corrigendum.
29	Serial 12 - External SAN storage – Support drives & Miscelleneous Page-107	"3 GBPS SATA II or equivalent ". Request to modify this as SATA II / FATA drives.	No change
30	Serial 12 - External SAN storage – Miscellaneous Page-107	Performance monitoring of the SAN has to be provided once in 6 months	The complete revised External SAN storage specification is given as an annexure to this corrigendum.
31	Serial 20 - LTO Tape library – number of drives Page - 122	4 extendable to 6 with multi streaming , multiplexing and for restore to optimize the drives scalable up to 18/12 Specification scalability is not clear. Please specify scalability is 6,12 or 18	The complete revised Tape Library specification is given in enclosed annexure with this corrigendum.
32	Serial 20 - LTO Tape library – number of tape cartridges Page - 122	Minimum 30/15 scalable up to 80/40. Slots requirement is not clear from this. Please clarify	The complete revised Tape Library specification is given in enclosed annexure with this corrigendum.
33	Logical diagram Page - 95	What does SA mean in the logical diagram	Modified diagram is enclosed in annexure with this corrigendum.
34	Logical diagram Page - 95	As the database server has to be in HA mode , both the server should be connected to SAN switch and in turn SAN box should be connected to	Modified diagram is enclosed in annexure with this corrigendum.

		both the switch for NSPOF	
35	Clause no. 3.8 (XXIV) – Technical Bid, SL. (i) - Servers and storage Page No 30	To clarify the desired level of RTO and RPO required so that solution to of all vendors be common all platforms	It will be decided in BCP-DRP policy, which is yet to be finalised
36	Clause No. g page no. 96	AAA authentication server, specifications are not mentioned in the tender document	Modified diagram is enclosed in annexure with this corrigendum.
37	External SAN storage	To incorporate Drive interface " Atleast 2 nos. of 2 Gbps per control , one no. of 4 Gbps per controller" having said so the availability and performance of SAN	The complete revised External SAN storage specification is given as an annexure to this corrigendum.
38		Minimum performance of 8 Gbps to the disk system as well as support of 1,10,000 jops , we confirm that the same is being achieved as per EMC drive interface design of " One no. of 4 Gbps disk interface port per controller"	The complete revised External SAN storage specification is given as an annexure to this corrigendum.
39	Server Requirement SNO.12 Page - 93	LTO Tape cartridge	Quantity to be changed to 100
	GENERAL		
1	Clause no. 4.6 (IV) page no. 53	In case of Sight not ready case, bidder has to install the items within three week of receipt of SNR notice. Please clarify	The clause to be re-read as ".. 3 (three) weeks of receipt of Site Ready notice from User/Project Co-ordinator else it .."
2		Purchase order for certification of training examination included in single order or separate order	As per discretion of REC
3	Annexure J Price Schedule, Table-1, Sl.No.12 Page – 89	Price item for 'LTO Tape cartridge'	Quantity to be changed to 100
	FMS		

Sl.No.	Clarification Sought for	Clarification by RECL
1	To provide the detailed list of "complete assets "(servers. desktops laptops etc)"	The two existing ERP servers are to be made within the FMS scope. Other existing systems are out of scope of the present tender. Specification for the same is given below:
	To provide the details of OS and critical applications installed	HP ML 570 G4 : RAM: DDR2 ECC 8 GB, HDD: 3 x 72 GB, OS : RH Linux ES 4.0 HP ML 350 G5 : RAM: DDR2 ECC 4 GB, HDD: 1 x 72 GB, OS: RH Linux ES 4.0
	Skill set required to provide the FMS	Level II
2	It is mentioned that monthly SLA compliance report needs to be submitted requesting to change to quarterly compliance report	No Change
3	The bidder is supposed to maintain an office at REC, what is the tenure (Clause 3.23.20, Page 45)	The partial clause to be re-read as "The contractor shall depute adequate number of personnel at the site at his cost, to receive .. "

4	Apart from the new set-up is there any existing infrastructure that would require facilities management	Existing 2 ERP servers and Integration with the existing set-up to be done
5	Total no. of users to be supported	Already mentioned in Page 5 of RFP
6	Please share connectivity details at the CO and other locations	Given in annexure of this corrigendum
7	Level of support required at locations other than CO. if hands and legs support is to be provided then will RECL pay for the on-call support?	CO & Annexe of CO (Palika Bhawan)
8	If certain critical activities require remote trouble shooting, will that be allowed?	Remote trouble shooting will be allowed within RECL network
9	Any specific concerns going ahead with a hybrid support model for facilities management	Integration and resolving of conflict issues proposed to be taken care by OLA (Operation Level Agreement)
10	How many users are working on Oracle Apps?	Already mentioned in Page 5 of RFP
11	What is the peak no. of users?	80% concurrency
12	At (during) what time is the peak load expected?	Working hours
13	Are there any remote users/ web based users	Yes
14	What is the backup policy?	Not yet finalized
15	What are the tools used for backup activity?	Presently manual. To be offered as per RFP
16	What is the disaster recovery / business continuity setup/plan	Not yet framed
17	Is the database shared with any other application?	No
18	Are there multiple database in use? (Oracle, MSSQL, DB2 etc)	No
19	How many support personnel is required and at what location for server only	As already specified in RFP
20	What is the current technical escalation mechanism?	Through Existing Facility Management

ANNEXURE

Serial No. 9: External SAN Storage

External Storage	
RAID Controller	Dual Active-Active controller with end-to-end FC design. There should not be any single point of failure in the storage array.
Cache	Min 2 GB cache per storage controller up gradable to 4 GB per controller. The upgrade shall be either by upgrading cache on controller or by replacing the storage controller.
Host Interface	At least 2 nos. of 4 Gbps FC front end ports per controller to deliver 4 nos. of 4 Gbps front end ports in storage array. (or equivalent aggregate host aggregate bandwidth of 16 Gbps)
Drive Interface	Adequate nos. of 2/4 Gbps FC ports per controller to deliver disk aggregate bandwidth of 16 Gbps
Support Drives	73/146/300 GB Dual ported 4Gbps , 15000 RPM drives FC drives,73/146/300GB , 2Gbps, 10000rpm FC drives, /500GB or higher 3Gbps SATA II or equivalent drives
RAID Levels	0,1,5,10
San Supported	All Standard San Switch needs to be supported
Disk Space	Min 4 TB raw disk space (Using 4Gbps 146GB FC disks ,4 Gbps of 15k rpm in an end to end 2/4Gbps architecture). The total disk space should be extendable up to at least 50 TB.
Connectivity	Through SAN Switch with FC cables.
Availability	• Should offer dual active-active load-balanced and failover controllers • Should offer redundant power supplies and cooling units • Should support hardware based RAID 0, 1, 5 and 10 • Should support LUN Masking and software for the same should be configured for supporting at least 64 hosts • Storage controller should be able to support data replication
Scalability	• Should support at least 95 disks with the same base controller • Should be upgradeable to the next version by mere upgradation of the controllers and without requiring data migration (data in place upgrade)
Performance	• Should support a bandwidth of at least 16Gbps per controller to the SAN/hosts • Should support agreegate bandwidth of at least 16Gbps to the Disk Expansion • Should support iops of 1,10,000.
Management	• The management should be array based and should provide GUI and Web based management • The storage system should be supplied with Point in time copy both for snapshot as well as for full copies. The license shall be provided for both features and for capacity configuration of 20 TB for proposed storage array. The disk system should be capable of Remote

	copy functionality.
Operating System Support	Windows HPUX Sun Solaris IBM AIX Linux
Additional Features (should support)	• Dynamic Array Expansion/Online disk upgrade within array. • Dynamic Volume/LUN Expansion • Dynamic RAID migration/ Virtual LUN migration .when applicaions are online • On-line firmware upgrade for controllers and Disk drives
SAN Software	SAN management software shall have the following features. If any software module requires exclusive hardware, it may be indicated and included in the scope of supply. All SAN software modules shall be preferably GUI based. • Storage configuration and Management • Centralized storage management.
Miscellaneous	• Must be able to support intermix disk capacity 73GB; 146GB, 300GB FC in a single disk drive enclosure and FC and SATA II or equivalent drive within storage array. • Hot spares disk modules should be a standard feature. The same Global Hot Spare disk should be available to all the disks anywhere in the storage system belonging to any RAID group (RAID 10 or RAID 5). At least 2 Global Hot Spare should be configured in addition to the capacity asked in the tender. • Performance monitoring report of the SAN storage to be submitted once in three months

Serial No. 12: LTO Tape Cartridge

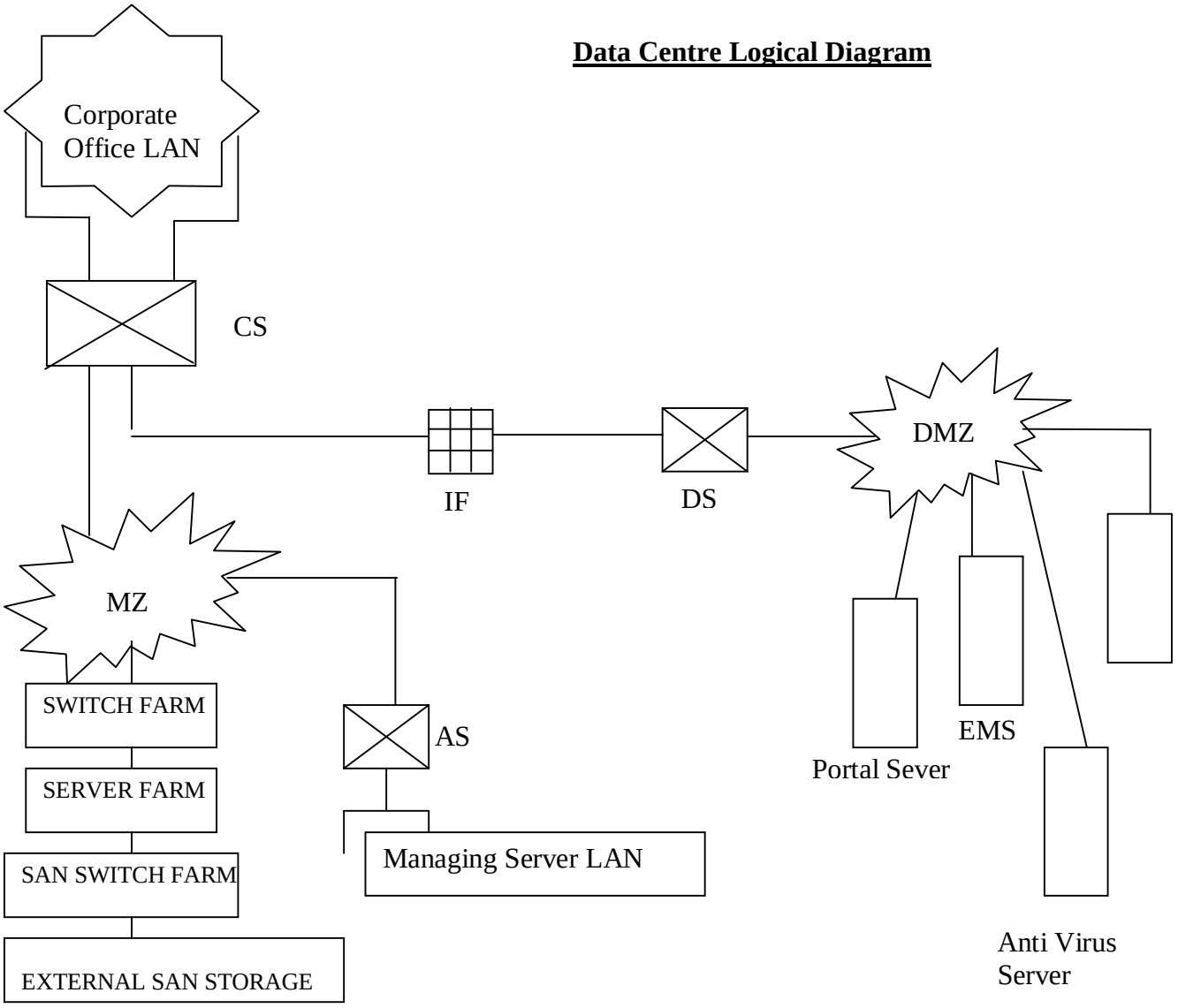
LTO Tape Cartridge	
Tape Drive Type	LTO Ultrium 4
Miscellaneous	Should Conform to the supplied LTO Tape Drive as per Serial no. 20.

Serial No. 20: LTO Tape Library

LTO Tape Library	
Tape Drive Type	LTO Ultrium 4, 4 Gbps native Fiber channel drive
Number of Drives	Min 2 extendable to 6 keeping in mind the backup window defined
Number of Tape Cartridges slots	Minimum 30 scalable upto 80
Number of Mail Slots	Minimum 2
Capacity	Min 800/1600 Gb native

Data Transfer Rate	At least 120 mbps native
San Supported	All Standard San Switch needs to be supported
O/S Supported	Windows / HP-UX / Solaris / AIX / RH Linux
Connectivity	Through SAN Switch with FC-AL cables.
Licensing	All related licensing including partitioning software should be supplied

Data Centre Logical Diagram



Abbreviations:

- CS-Central Switch
- AS-Access Switch
- IF-Internet Firewall
- DS-Distribution Switch
- MZ – Militarized Zone
- DMZ – De-Militarized Zone

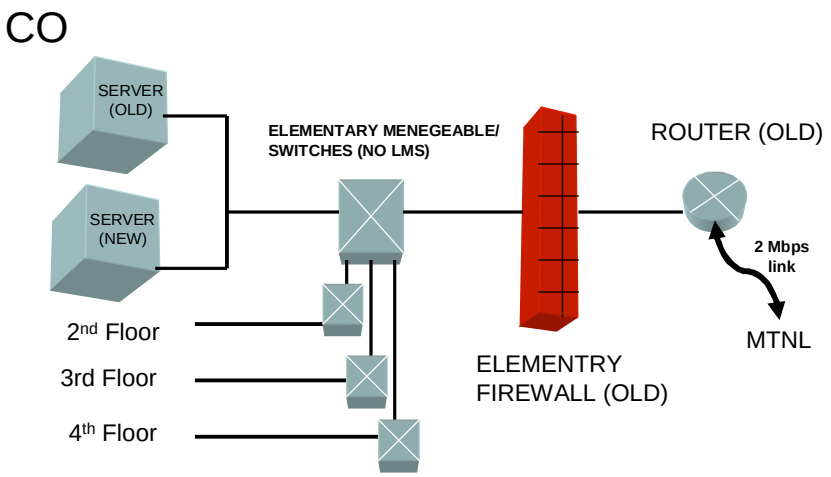
Severs in Server Farm:

a) Production Database Servers
b) Production Application Servers
c) Quality Assurance (QA) Database Servers
d) Quality Assurance (QA) Application Server
e) Development servers
f) Discoverer Server
g) Backup Server
h) Hardware Load Balancer

Servers in DMZ

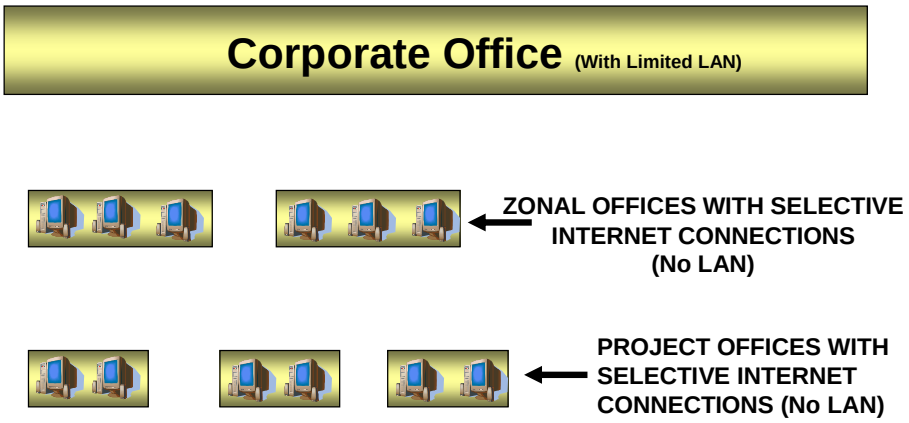
a) Portal Server
b) ITSM/ EMS Server
c) DNS, LDAP, DHCP Servers
d) Anti Virus Server
e) Any other

Existing IT Infrastructure



FOR ZO/PO

Existing IT Infrastructure



CO IT Infrastructure

- The present CO Local Area Network (LAN) is having un-managed/elementary managed switches connected through structured cabling.
- The existing applications like Financial Accounting Software, Loan Accounting Software, Payroll, CPF etc are running using this LAN

ZO/PO IT Infrastructure

- The ZOs/POs/CIRE are all working stand-alone
- The present IT infrastructure at ZO/PO consists of a number of desktop PCs, number varying depending on the size of the offices. All are working as stand-alone PC. There is no connectivity between these PCs except through internet.
- Each of these offices are connected to the internet through a MTNL/BSNL broadband connection.