



Government of Tamil Nadu
Directorate of Municipal Administration
Tamil Nadu Urban Development Project III
Ezhilagam Annexe, Chepauk, Chennai – 600 005
Phone No: (044) 28410363, 28549960, 28549921,
Fax: (044) 28549924, 1 E-mail: cma@cma.gov.in

INDIA
Tamil Nadu Urban Development Project III
Loan No: 4798-IN

Request for Expression of Interest

The State of Tamil Nadu, India, has received a loan from the International Bank for Reconstruction and Development (IBRD), and intends to apply a part of the loan proceeds to make payments under the contract for imparting training programmes for the Officials of the ULBs.

The services include; design and development of training modules, planning and implementing the following training programmes for the Officials of ULBs of Tamil Nadu.

1. Six days Advanced level training programme on **LINUX** for the IT Personnel of the ULBs covering 120 participants in 8 batches.
2. Twelve days training programme on **Oracle** for the IT personnel of the ULBs covering 120 participants in 8 batches

The Terms of Reference for the above assignments are available from the Directorate of Municipal Administration, Chepauk, Chennai – 05 and in the Website <http://www.tn.gov.in/cma>. (Please check in 'What is New' Section in the Website.)

Sd/- Dr.P.Senthilkumar
Director of Municipal Administration

/Forwarded by order/

For Director of Municipal Administration

The Director of Municipal Administration now invites Training Institutions, Consultancy firms and Individual Consultants to register their interest for providing the services by sending the following information.

a.	Name, address and fax number of Consultancy firm
b.	Ownership and Organizational Structure of the firm
c.	Financial Statement for the last three years
d.	Name and short CVs of Key Staff
e.	Details of Experience in Similar nature of the assignment.

Expression of Interest must be submitted separately for each training programme during office hours on or before **15.10.2010** to the above address. Documents received thereafter will not be accepted.

On the basis of obtained information from interested Consultants, the Director of Municipal Administration will prepare and short-list of Six Consultants who will be invited to submit their proposals.

Interested parties may obtain further information about the Consultancy assignment from the following officers at the address mentioned below:

Contact Person:

Thiru.V.Pitchai, Additional Director of Municipal Administration or
Thiru.R.Lingasamy, Procurement & Administrative Officer (i/c)
Mobile No: 9444343063

Thiru.M.Manikandan, Training and Institutional Development Specialist,
TNUDP-III at telephone no: 044-2855020.Mobile No: 8056166655

Contact hours: 10:00 am to 5.45pm

Sd/- Dr.P.Senthilkumar
Director of Municipal Administration

/Forwarded by order/

For Director of Municipal Administration

Terms of Reference

Training Programme on Linux : Basic, System, Network and Security Administration for IT Professionals of the ULBs.

1. Background:

To cope up with the increasing demand for basic services, the Urban Local Bodies (ULB's) need to strengthen their Financial, Technical and Managerial capacities.

The 74th (Decentralization) Constitutional Amendment provides for the devolution of additional functions and finances to the ULBs. However, most ULBs' are prepared to assume their new and expanded roles under the 74th Constitutional Amendment, to assist them in meeting these new challenges ICT, Computer Hardware, IT Manpower, Software, Peripherals and Application Modules of all aspects of Urban Management have been provided and introduced E-governance activities in 102 Municipalities and 5 Corporations in the State of Tamil Nadu. The E-governance activities are being implemented in recently upgraded 50 Grade III Municipalities.

At present, E-governance in Tamil Nadu Urban Local Bodies have been successfully implemented. The citizen centric services are being introduced at all urban local bodies. Day-by-day the volume of data transmitted over the ULB network is increasing and the System, Database and Network Management have become the critical issue. So, the training on Linux System Administration is very much essential for the System Administrators to manage the data and network.

2. Objectives:

The main objectives of these training programmes are:

- To train the IT Professionals of the ULBs in the concepts, of Linux System Administration and Maintenance.
- Managing and Maintaining a Linux environment
- Managing and maintaining Linux Security and Network Environment
- Planning, Implementing and Maintaining & Designing a Linux Directory Infrastructure

3. An outline of the tasks to be carried out:

The scope of training would include the following:

- 3.1 The training is designed to be imparted to the **IT Personnel** of the ULBs. There are about **120 persons** to be trained under this programme.
- 3.2 They need to be trained in **8 batches** of about **15 participants** per batch.
- 3.3 The duration of the training programme will be **6 days**

3.4 The training programme should ensure achievements of the objectives set out above.

3.5 The training would be through hands on and interactive discussions.

3.6 **Scope of work of the assignment shall include:**

- (i) Preparation of course material for the training programme and obtaining the approval of the same from the Director of Municipal Administration, TNUDP III, Chennai-05 prior to the commencement of the first batch of the training programme. At the end of the programme the course material and other reports should be submitted in the form of a CD for the purpose of information exchange and putting it in the website in addition to 5 hard copies of the course material for reference.
- (ii) Course materials to contain both reading material and hands out in the form of learners note, guidelines, quick reference guide etc. All the material developed as part of course kit should be in **English**
- (iii) You may offer comments, suggestions and improvements with justification on the TOR
- (iv) Each participant will be evaluated using a short test before and after the training (**pre and post evaluation**). The difference between the two tests can be considered as training gain.
- (v) Submission of documentation report at the end of the programme comprising the salient features of the training activity under this programme, suggestions and recommendations emerging from the participants, compilation and an analytical note of the evaluation sheet (pre evaluation and post evaluation) submitted by the participants and over all summary report on completion of the entire programme.
- (vi) The course materials should be provided to participants along with scribbling pad, pen, folders, bag etc
- (vii) Instructors / Coaches with relevant specific experience and expertise be selected for each specific session given in the training module.
- (viii) The session activities should provide more scope for teamwork, discussion and interaction of the participants.
- (ix) The presentation shall be made using Power Point slides / Overhead projector.
- (x) The participants should be exposed to a different and successful project sites and interaction with stakeholders directly.
- (xi) Arrangement of hall with training accessories and provision of working lunch (vegetarian and non-vegetarian) with tea and snacks in the morning and in the evening.
- (xii) Provision of A/c. accommodation on double occupancy basis for the outstation participants with arrangements for the breakfast and the

dinner. It is preferable to have these arrangements in the same institution where the training programme is held.

- (xiii) The consultant is to identify 3 to 5 prospective participants in each batch for further training and to utilize as TOT

4. **Schedule for completion of tasks:**

- 4.1 The training programme may commence in **December 2010** and be completed before **March 2011**. The duration of batch is **7 to 8 hours per day** with tea / lunch break.
- 4.2 The training shall be organized in a suitable training venue that may include training institutions provided necessary infrastructure available to the satisfaction of the officials of the TNUDP-III and the DMA.

5. **Data, services and facilities to be provided by the Director of Municipal Administration**

The Director of Municipal Administration shall furnish the list of participants for each batch to the consultancy firm.

6. **Final outputs required of the consultancy firm:**

- (i) The Consultancy firm / Institute is expected to give a set of course material comprising the reading material, brief summary note on each session for reference of the participants and trainers note for each session. This output should be produced and got approved by the Review Committee of the O/o. the DMA before commencement of the session.
- (ii) A report on the evaluation (including pre evaluation with a set of 'knowledge questions' and post evaluation to see 'knowledge gain') of each batch and a comprehensive evaluation report of the entire programme giving the evaluation of various aspects of the programme from the point of view of the participants emerged as part of feedback and various suggestions and comments which will be useful as input for the future programmes and improve their performance in the working environment.
- (iii) At the end of each training programme the Consultancy firm / the institute will identify **one or two trainers** from each batch who can be utilized as resource persons in future.

7. **Composition of the Review Committee and the review procedure to monitor the consultants work;**

- 7.1.1 The committee consisting of the following officers will review and evaluate the training proposal, the coverage and quality of course material, the

progress and the quality of training programme as and when necessary. (The firm or the institutions is expected to prepare a comprehensive feed back report of the participants with over all the final bill. The review committee will review the same before releasing the final payment. In case any deficiency found in the content of the course material, feed back and the course completion report the Consultant will be requested to revise it suitably).

- (1) Director of Municipal Administration or his nominee
- (2) Joint Commissioner of Municipal Administration, O/o.DMA
- (3) Managing Director & Chief Executive Officer, TNUIFSL or his Nominee.
- (4) Representative of NIC / ELCOT
- (5) Financial Adviser, O/o DMA.
- (6) ITS, TNUDP-III, O/o.DMA

7.2 The Director of Municipal Administration reserves the right to cancel the training programme at any point of time, if the performance is found to be not satisfactory.

7.3 **Terms of Payment**

The mode of payments to be made in consideration of the work to be performed by the consultant shall be as follows:

- (i) 40% of contract value - After acceptance of the Letter of Award and acceptance of the course material
- (ii) 20% of contract value - On successful completion of **3** batches of training programme.
- (iii) 20% of contract value - On successful completion of **6** batches of training programme
- (iv) 10% of contract value - On successful completion of all batches of the training and submission of all relevant reports / documents and after the Review Committee reviewed the comprehensive feed back of the participants.

8. List of Key positions:

The list of resource persons (for preparation of course material and of the session) whose CV and experience would be evaluated:

No	Key personnel	Minimum Qualifications	Minimum Experience
1.	Programmer coordinator - 1	Master Degree in Business Administration	Key personnel should be an individual having minimum 5 years experience in conducting / coordinating Training Programmes on various topics.
2.	Instructors (2 Nos)	B.E / B.Tech / MCA / MSc-IT With RHCE Certification	Key personnel should be an individual having minimum 3 years teaching experience in Linux and its supporting tools, System administration and Networking.

Note: The consultant is expected to provide minimum 2 Lab Assistant for Hands on Training.

9. Course Content:

Name of the Training Programme	:	Linux Administration of the ULBs
Duration	:	6 days
Batches	:	8 batches
Target Group	:	IT Professionals

DAY	SESSION	Topics
DAY - 1	1.	Introduction - an overview
	2.	Getting the feel <ul style="list-style-type: none"> Running Commands and Getting Help Browsing the File system Lab.
	3.	Working with Shells <ul style="list-style-type: none"> The Bash Shell Lab.
	4.	I/O Streams and Piping <ul style="list-style-type: none"> Standard I/O and Pipes Lab.
	5.	User Administration <ul style="list-style-type: none"> Users, Groups, and Permissions Lab.
	6.	File system Concepts <ul style="list-style-type: none"> The Linux File system In-Depth Lab.
	7.	GUI <ul style="list-style-type: none"> Configuring the bash Shell Configuring GNOME Lab

	8.	Advanced User administration <ul style="list-style-type: none"> Advanced Topics in Users, Groups, and Permissions Lab.
DAY - 2	9.	<ul style="list-style-type: none"> Editor - Advanced Uses of the vi and vim Editors Lab.
	10.	String Processing
	11.	File Processing <ul style="list-style-type: none"> Introduction to String Processing. String Processing with Regular Expressions Lab. Finding and Processing Files Investigating and Managing Processes Lab.
	12.	Process Management <ul style="list-style-type: none"> Investigating and Managing Processes Network Clients Lab.
	13.	Shell Scripting <ul style="list-style-type: none"> bash Shell Scripting Lab.
	14.	<ul style="list-style-type: none"> bash Shell Scripting (Continued) Lab.
	15.	<ul style="list-style-type: none"> bash Shell Scripting (Continued) Lab.
	16.	<ul style="list-style-type: none"> So...What now?
Day -3	17.	<ul style="list-style-type: none"> Installation Installation Lab.
	18.	<ul style="list-style-type: none"> Managing Services - System Initialization and Services Lab.
	19.	<ul style="list-style-type: none"> Managing Kernel - Kernel Services and Configuration Lab.
	20.	Managing File System
	21.	Networking Configuration <ul style="list-style-type: none"> Network Configuration Lab.
	22.	Installing Applications and automated Installation <ul style="list-style-type: none"> RPM and Kick start Lab.
	23.	Advanced User Administration <ul style="list-style-type: none"> User Administration Lab.
	24.	<ul style="list-style-type: none"> User Administration (Continued) Lab.
DAY - 4	25.	Managing Printing <ul style="list-style-type: none"> Printing and Administration Tools Lab
	26.	<ul style="list-style-type: none"> Printing and Administration Tools (Continued) Lab.
	27.	Advanced GUI Concepts <ul style="list-style-type: none"> The X Window System Lab.
	28.	Advanced File system Management <ul style="list-style-type: none"> Advanced File system Management Lab.
	29.	<ul style="list-style-type: none"> Advanced File system Management (Continued) Lab.
	30.	Troubleshooting Common problems
	31.	<ul style="list-style-type: none"> Troubleshooting (Continued) Lab.
	32.	Doubt Session... - Q & A
	33.	A review of system Services <ul style="list-style-type: none"> Introduction to System ServicesMLab.
	34.	Networking Revisited <ul style="list-style-type: none"> Organizing Networked Systems Lab.
	35.	<ul style="list-style-type: none"> Organizing Networked Systems (Continued)Lab
	36.	<ul style="list-style-type: none"> Network File Sharing Services Lab.

DAY - 5	37.	• Network File Sharing Services (Continued) Lab.
	38.	Introduction to Mail Services • Electronic Mail Services Lab.
	39.	• Electronic Mail Services (Continued) Lab.
	40.	• The HTTP Service Lab.
DAY - 6	41.	Introduction to Security Concepts... • Security Concerns and Policies Lab.
	42.	Introduction to Authentication Services • Authentication Services Lab.
	43.	• Authentication Services (Continued) Lab.
	44.	• Introduction to system Monitoring -System Monitoring Lab.
	45.	• Securing Networks Lab.
	46.	• How to secure services? - Securing Services Lab.
	47.	• How to Secure Data? - Securing Data Lab.
	48.	Feed back and Evaluation

Sd/-Dr.P.Senthilkumar
Director of Municipal Administration

Terms of Reference

12 days Training on Oracle 9i/10g DataBase Administration (DBA) for the IT Professionals of ULBs

1. Background:

To cope with increasing demand for basic services, Urban Local Bodies (ULBs) need to strengthen their Financial, Technical and Management capacities.

The 74th (Decentralization) Constitutional Amendment provides for the devolution of additional functions and finances to ULBs. However, most ULBs are prepared to assume their new and expanded roles under the 74th Constitutional Amendment, to assist them in meeting these new challenges. Computer Hardware, IT Manpower, Software, Peripherals and Application Modules of all aspects of Urban Management were provided and introduced. E-governance activities in 102 Municipalities and 5 Corporations in the State of Tamilnadu. E-governance activities are being initiated in recently upgraded 50 Grade III Municipalities.

Under TNUDP project, Oracle original software has been procured and implemented in ULBs. The local body Database has been created in Oracle 9i. The Citizen services are being provided through 325 centres throughout the State of Tamilnadu. The valuable data are being stored in a ORACLE 9i Relational DataBase Management System (RDBMS). The Programmers and Assistant Programmers posted at each local body are managing the Database Administration, to provide smooth citizen services with minimum knowledge on RDBMS.

As day-by-day the volume data is being increasing and the Database Management is the vital issue, the training on Oracle DBA is very much essential for the Database Administrators to manage the data.

2. Objectives:

- i) The main objective of the training programmes is:
- ii) To train the IT Professionals of the ULBs in the concepts, principles, objectives and the need of Oracle DBA.
- iii) To make them understand the basic concepts of Database Architecture, Managing Oracle, Maintenance of Database, Data Dictionary contents and its usage of the Oracle Database available in the ULBs.
- iv) Sqlplus* and PL/SQL statements
- v) Oracle (Windows/Linux) Installation and Configuration
- vi) Basic Oracle Net Architecture

- vii) Backup and Recovery methodology
- viii) Performance Turning of existing Oracle Database
- ix) To upgrade their skills and make them understand to generate their own reports using existing Database

3. **An outline of the tasks to be carried out:**

The scope of training would include the following:

- 3.1 The training is designed to be imparted to the *IT Professionals* of the ULBs. There are about **120 persons** to be trained under this programme.
- 3.2 They need to be trained in **8 batches** of about **15 participants** per batch.
- 3.3 The duration of the training programme will be **12 days**
- 3.4 The training programme should ensure achievements of the objectives set out above.
- 3.5 The training would be through hands on and interactive discussions.

3.6 **Scope of work of the assignment shall include:**

- (i) Preparation of course material for the training programme and obtaining the approval of the same from the Director of Municipal Administration, TNUDP III, Chennai-05 prior to the commencement of the first batch of the training programme. At the end of the programme the course material and other reports should be submitted in the form of a CD for the purpose of information exchange and putting it in the website in addition to 5 hard copies of the course material for reference.
- (ii) Course materials to contain both reading material and hands out in the form of learners note, guidelines, quick reference guide etc. All the material developed as part of course kit should be in **English**
- (iii) Before finalization of training material views of the probable participants should also be obtained for their requirement from this training.
- (iv) Each participant will be evaluated using a short test before and after the training (**pre and post evaluation**). The difference between the two tests can be considered as training gain.
- (v) Submission of documentation report at the end of the programme comprising the salient features of the training activity under this programme, suggestions and recommendations emerging from the participants, compilation and an analytical note of the evaluation sheet (pre evaluation and post evaluation) submitted by the participants and over all summary report on completion of the entire programme.
- (vi) The course materials should be provided to participants along with scribbling pad, pen, folders, bag etc

- (vii) Instructors / Coaches with relevant specific experience and expertise be selected for each specific session given in the training module.
- (viii) The session activities should provide more scope for teamwork, discussion and interaction of the participants.
- (ix) The presentation shall be made using Power Point slides / Overhead projector.
- (x) The participants should be exposed to a different and successful project sites and interaction with stakeholders directly.
- (xi) Arrangement of hall with training accessories and provision of working lunch (vegetarian and non-vegetarian) with tea and snacks in the morning and in the evening.
- (xii) Provision of A/c. accommodation on double occupancy basis for the outstation participants with arrangements for the breakfast and the dinner. It is preferable to have these arrangements in the same institution where the training programme is held.
- (xiii) The consultant is to identify 3 to 5 prospective participant in each batch for further training and to utilize as TOT

4. **Schedule for completion of tasks:**

- 4.1 The training programme may commence in **December 2010** and be completed before **June 2011**. The duration of batch is **7 to 8 hours per day** with tea / lunch break.
- 4.2 The training shall be organized in a suitable training venue that may include training institutions provided necessary infrastructure available to the satisfaction of the officials of the TNUDP-III and the DMA. The Officers of the RDMA's will also be associated with this training programme.
- 5. The Director of Municipal Administration shall furnish the list of participants for each batch to the consultancy firm.

6. **Final outputs required of the consultancy firm:**

- (i) The Consultancy firm / Institute is expected to give a set of course material comprising the reading material, brief summary note on each session for reference of the participants and trainers note for each session. This output should be produced and got approved by the Review Committee of the O/o. the DMA before commencement of the session.
- (ii) A report on the evaluation (including pre evaluation with a set of 'knowledge questions' and post evaluation to see 'knowledge gain') of each batch and a comprehensive evaluation report of the entire programme giving the evaluation of various aspects of the programme

from the point of view of the participants emerged as part of feed back and various suggestions and comments which will be useful as input for the future programmes and improve their performance in the working environment.

- (iii) At the end of each training programme the Consultancy firm / the institute will identify **one or two trainers** from each batch who can be utilized as resource persons in future.

7. Composition of the Review Committee and the review procedure to monitor the consultants work;

7.1.1 The committee consisting of the following officers will review and evaluate the training proposal, the coverage and quality of course material, the progress and the quality of training programme as and when necessary. (The firm or the institutions is expected to prepare a comprehensive feed back report of the participants with over all the final bill. The review committee will review the same before releasing the final payment. In case any deficiency found in the content of the course material, feed back and the course completion report the Consultant will be requested to revise it suitably).

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- (4) Representatives of NIC
- (5) Financial Adviser, O/o DMA.
- (6) ITS, TNUDP-III, O/o.DMA

7.2 The Director of Municipal Administration reserves the right to cancel the training programme at any point of time, if the performance is found to be not satisfactory.

7.2 Terms of Payment

The mode of payments to be made in consideration of the work to be performed by the consultant shall be as follows:

- (i) 40% of contract value - After acceptance of the Letter of Award and acceptance of the course material
- (ii) 25% of contract value - On successful completion of **3** batches of training programme.
- (iii) 25% of contract value - On successful completion of **6** batches of training programme

- (iv) 10% of contract value - On successful completion of all batches of the training and submission of all relevant reports / documents and after the Review Committee reviewed the comprehensive feed back of the participants.

8. List of Key positions:

The list of resource persons (for preparation of course material and of the session) whose CV and experience would be evaluated:

No	Key personnel	Minimum Qualifications	Minimum Experience
1.	Programme Coordinator	Master Degree in Business Administration	Key personnel should be an individual having minimum 5 years experience in conducting / co-ordinating Training Programmes on various topics.
2.	Instructor - 1	B.E / B.Tech / MCA / MS-IT/ MSC-IT With OCP Certification (Oracle Certified Professional)	Key personnel should be an individual having minimum 3 years teaching experience in Windows family its supporting tools, Networking, System Integration, preferably with knowledge on Win 2003/2008/Linux and Oracle 9i/10g Good Communication skill is must.
		B.E / B.Tech / MCA / MS-IT/ MSC-IT With OCP Certification	Key personnel should be an individual having minimum 3 years teaching experience in Windows family its supporting tools, Networking, System Integration, preferably with knowledge on Win 2003/2008 and Oracle 9i/10g Good Communication skill is must.

Note: The consultant is expected to provide minimum 2 Lab Assistant for Hands on Training.

9. Course Content:

Name of the Training Programme : **Training on Oracle 9i/10g**
 DataBase Administration (DBA) for
 the IT Professionals of ULBs

Duration : 12 days

Batches : 8 batches (15 persons per batch)

Target Group : IT Professionals of the ULBs

Topics
<p>Topics included (both Windows server & Linux Server)</p> <p>1. Architecture & Configuration</p> <p>1-0: SQL., SQL execution Internals, PL/SQL development including writing Oracle stored procedures, cursors, functions, packages and database triggers – Oracle Architecture components - Setting up security and user management, configuring flexfields, Managing concurrent processors and scheduled request, ensuring complaints with accepted auditing procedures and setting up other essential application features such as profile options, effectively organize and prioritize multiple tasks – Oracle database installation, configuration and cloning.</p> <p>1-1: Overview of Oracle DBA tasks</p> <ul style="list-style-type: none"> • Oracle as a flexible, complex & robust RDBMS • The evolution of hardware and the relation to Oracle • Different DBA job roles (VP of DBA, developer DBA, production DBA, database babysitter) • The changing job role of the Oracle DBA • Environment management (network, CPU, disk and RAM) • Instance management (managing SGA regions) • Oracle table and index management <p>1-2: Instance Architecture</p> <ul style="list-style-type: none"> • Instance vs. database • Components of an instance • Creating the OFA file structure (\$DBA, bdump, udump, pfile) <p>1-3: Oracle Instance Internals</p> <ul style="list-style-type: none"> • SGA vs. PGA • Background processes • Interfaces with server and disk I/O subsystem <p>1-4: Using SQL*Plus for DBA management</p> <ul style="list-style-type: none"> • Connecting and executing SQL • Using the “as sysdba” syntax • Overview of SQL*Plus DBA commands (startup, etc.)

1-5: Control file, UNDO and REDO management

- Explaining the use of control files
- Listing the Contents of the control File
- File locations for control Files
- Obtaining Control File Information
- Listing control file contents
- Displaying and Creating Undo segments
- Altering Undo Segments
- Determining the Number and Size of Undo segments
- Understanding flashback technology
- Troubleshooting Undo – snapshot too old
- Redo log concepts for recovery
- Online redo log (log_buffer) online redo logs and archived redo logs
- Oracle ARCH and LGWR background processes
- Redo log dictionary queries
- Redo log switch frequency and performance
- Multiplexing the Online Redo Log Files
- Archiving the Oracle Redo Logs
- Recovery using the redo log files

1-6: User and privilege management

- The three security methods (VPD, Grant security/role-based security, grant execute)
- Creating New Database Users
- Using pre-spawned Oracle connections
- Auditing User activity
- Identifying System and Object Privileges
- Granting and Revoking Privileges
- Creating and Modifying Roles
- Displaying user security Information from the Data Dictionary

2. Oracle database management

2-1: Overview of instance management

- Parameter files (init.ora, listener.ora, tnsnames.ora)
- Rules for sizing SGA components
- Automated Oracle memory management (AMM)

2-2: Initialization file management

- Creating the init.ora file
- Using spfile
- Displaying init.ora values with v\$parameter

2-3: Oracle*Net configuration

- Creating the listener.ora file
- Creating the tnsnames.ora file

Usage and configuration of the Oracle shared server

2-4: Data buffer configuration & sizing

- Inside the Oracle data buffers
- Using the KEEP pool
- Monitoring buffer effectiveness
- Using multiple block sizes (multiple buffer pools)

2-5: Shared pool and PGA configuration & Sizing

- Shared pool concepts and components
- Understanding the library cache
- Relieving shared pool contention
- Overview of PGA for sorting and hash joins
- Using `sort_area_size`, `hash_area_size` and `pga_aggregate_target`

2-6: Troubleshooting network connectivity

- Verifying network connectivity with ping and `tnsping`
- Testing database links

3. Oracle object management

3-1: Oracle tables, views and materialized views

- Types of Oracle tables (regular, IOT, sorted hash clusters, nested tables)
- Oracle Views
- Oracle materialized views

3-2: Oracle indexes

- Types of Oracle indexes (b-tree, bitmap, bitmap join index)
- Creating B*-Tree, bitmap and function-based indexes
- Function-based indexes
- Finding indexing opportunities
- Index maintenance

3-3: Oracle constraints

- Costs & benefits of constraints
- Types of Oracle indexes constraints (check, not null, unique, PK, FK)
- Cascading constraints

3-4: Schema, File & tablespace management

- Describing the relationship between data files, tablespaces and table
- Understanding Oracle segments
- Creating Tablespaces – using the `autoextend` option
- Changing the Size of Tablespaces – `alter database datafile` command
- Defining a TEMP tablespace
- Changing the default storage Settings for a tablespace
- Review of the storage parameters in DBA views (ASM, ASSM, `pctfree`, `pctused` and `freelists`).
- Monitoring Chained rows (`fetch continued rows`)
- Monitoring Insert and Update performance (`pctused`, `APPEND`)

3-5: Database Maintenance

- Reason for reorgs – chained rows, imbalanced freelists

- Reorganizing Tables using Export and Import
- Using CTAS to reorganize data
- Index rebuilding
- Backup & Recovery overview (hot & cold Backups, RMAN, block change tracking)

3-6: Oracle DBA Utilities

- Data pump (Imp and exp utilities)
- SQL*Loader
- LogMiner
- Flashback
- DataGuard
- Oracle DBA utilities – Oracle dbms packages (dbms_redefinition)
- Replication (Streams, multimaster, materialized views)

4. Monitoring Oracle

4-1: Dictionary and v\$ views

- The dba_, all_ and user_ structures
- Querying the tables, indexes, and segments views
- Querying the AWR (STATSPACK) tables

4-2: Table & index monitoring

- Monitoring table extents and fragmentation
- Using the dba_tables and dba_segments views
- Monitoring table CBO statistics
- Monitoring table extents and fragmentation
- Locating chained rows
- Monitoring table & index growth
- Monitoring index usage
- Monitoring index fragmentation
- Locating un-used indexes
- Identifying IOT candidates
- Reorganizing Indexes with alter index rebuild
- Dropping Indexes
- Getting Index Information from the Data Dictionary

4-3: workload & trend monitoring

- Oracle automated workload tools
- Using v\$bh to monitor buffer activity
- Using v\$sql and v\$sql_plan

4-4: Instance monitoring

- Monitoring with the AWR and STATSPACK
- Creating a time-series performance report
- Using www.statpackanalyzer.com
- Scripts for AWR and STATSPACK
- Plotting performance data (Ion, Excel)
- Finding performance trends and signatures

4-5: Oracle environment monitoring

- Displaying and managing Oracle sessions (v\$session, v\$process)
- Using AWR to monitor disk, network and CPU consumption
- Monitoring the alert log
- Oracle trace/dump files

4-6: STATSPACK and AWR performance management

- Installing STATSPACK
- Running STATSPACK reports
- Interpreting a STATSPACK report
- Getting time series reports with STATSPACK
- Finding performance signatures with STATSPACK

5. Performance Management

5-0: Overview of Oracle 9i/10G Performance Tuning – Diagnostics and tuning tools – sizing the shared pool and the buffer cache – sizing the other SGA structures – Database configuration and I/O issues – Optimizing sort operations – diagnosing contention for latches – Tuning rollback segments – Monitoring and detecting lock contention – Tuning the Oracle shared server – Application tuning – Using Oracle blocks efficiently – SQL statement tuning – Tuning the OS and using Resource manager.

5-1: Bottleneck performance analysis

- Drill-down into AWR reports
- Top-5 timed events
- External Server Bottlenecks (Network, I/O, RAM, CPU)
- Network troubleshooting

5-2: Instance Tuning

- Changing init.ora optimizer parameters (index_optimizer_cost_adj, optimizer_mode)
- Managing region parameters (shared_pool_size, db_cache_size)
- Understanding instance contention (e.g. Buffer busy waits, library cache contention)

5-3: SQL and CBO behavior

- Introduction to cost-based optimization
- Changing the default optimizer modes
- Optimizer parameters
- Dynamic sampling
- Collecting table and index statistics (dbms_stats)
- Using column histograms and skewonly

5-4: Tracing SQL Execution

- Using EXPLAIN PLAN
- Using “set autotrace”
- Interpreting EXPLAIN PLAN Output
- Using TKPROF / SQL*Trace

5-5: SQL Execution Internals

- Review of Basic joining methods
 - Merge join
 - Hash Join
 - Nested Loop join
 - Advanced SQL operators
 - Between operator
- 5-6: SQL Tuning

- Using hints to improve SQL performance
- Using parallel query to improve performance
- SQL reusability within the library cache
- Table high-water mark
- Table striping and table partitions
- Using indexes to improve performance
- Identifying full-table scans
- Re-writing SQL queries
- Tuning sub-queries

6-1: Oracle High Availability tools

- Continuous availability and disaster recovery
- Quantifying the cost of unplanned downtime
- Oracle multi-master replication
- DataGuard
- Oracle Streams
- Real Application Clusters

Grid controls, full EBS (e-business suit) cloning , Oracle Applications concurrent manager trouble shooting.

Data warehousing

6-2: Backup & Recovery

- OS-level backups

Instance and Media Recovery structures

- Hardware-level backup & recovery
- Block-level change tracking
- Disk mirroring
- Backup & recovery and RAID level
- Oracle-level backups (expdp & RMAN)

User managed backups

Backup in assisting Oracle's Fusion Middleware space

- Hot vs. Cold backups

Sd/- Dr.P.Senthilkumar
Director of Municipal Administration