

Certificate Course in Open Source Technologies

Course Contents

Annexure A

Training on PostgreSQL

(20 Days)

RDBMS Concepts

Audience

New to RDBMS.

Topics

Fundamentals of Database Systems

- Introduction to Database Systems
- Architecture of a Database Systems
- Database Terminology

Types of Data Models

- Distributed and Object-oriented Database
- Object-based Logical Models
- Record-based Logical Models

Database Objects

- Data Structures
- Database Management System
- Roles of Database Personal

Relational Database Management System

- Features of a Relational Models

- Normalization
- Denormalization
- PostgreSQL and other RDBMSs

Developing the Relational Model

- Relational (Physical) Model
- Data Storage Language
- Data Definition Language
- Data Manipulation Language

Implementing Databases with PostgreSQL

Audience

We recommend that students attending this PostgreSQL training course have a basic understanding of programming concepts and RDBMS

Topics

Database Fundamentals

Installing & Configuring PostgreSQL

Using the psql Client

Understanding PostgreSQL Data Types

- Numeric data types

- Character types
- Binary data types
- Date & time types
- Boolean values
- Array types
- Other data types

Understanding & managing sequence numbers

Creating tables (DDL)

- Using CREATE TABLE
- NOT NULL constraints
- PRIMARY KEY constraints
- FOREIGN KEY constraints

Modifying tables (ALTER TABLE)

- Creating & managing indexes
- Creating indexes
- Indexes on expressions
- Partial indexes

Data manipulation language (DML)

- Inserting data
- Using COPY to perform data loads
- Using DELETE to remove rows
- Updating data using UPDATE

Retrieving information from tables using SELECT



Performing table joins

- o Cross joins
- o Inner joins
- o Outer joins
- o Natural joins

Using SQL Select Statement

- o Restricting selections using the WHERE clause
- o Joining tables with WHERE
- o Using ORDER BY to sort query results
- o Limiting rows returned using LIMIT
- o Computing summary values
- o Using the GROUP BY clause
- o Using the HAVING clause
- o Using DISTINCT to eliminate duplicates
- o Using UNION, INTERSECT and EXCEPT to join SELECT Results
- o Pattern matching using LIKE

Conditional expressions

- o The CASE statement
- o The COALESCE function
- o The NULLIF function

Subquery expressions

- o The EXISTS expression
- o The IN (and NOT IN) expression

Working with array values

Performing type casting and conversion

PostgreSQL functions

- o Numeric functions
- o Character functions
- o Session information functions

Transactions and concurrency

- o Managing Transactions

- o ACID Properties
- o BEGIN
- o COMMIT
- o ROLLBACK

PostgreSQL Database Internals, Management and Tuning

Audience

We recommend that students attending this PostgreSQL training course have understanding of RDBMS and SQL

Topics

Introduction to PostgreSQL Administration

- o Major Features
- o Limits
- o PSQL
- o Configuration
- o Creating & Managing Databases
- o Routine Tasks
- o Monitoring & Statistics
- o Performance Tuning

Introduction & Architecture

- o History of PostgreSQL
- o Major Features
- o Architectural Overview
- o Limits
- o Architectural Overview
- o Major Features
- o Directory Structure
- o Multi-Version Concurrency Control (MVCC)
- o Write-Ahead Logging
- o Database File Layout
- o Database Page Layout

PostgreSQL System Architecture

- o Architectural Summary
- o Process Architecture
- o Database Clusters
- o PostgreSQL Terminology
- o Physical Database Architecture
- o Data File Architecture
- o Connect Request
- o Backend Spawning

Installation

- o Installation using
- o PostgreSQL Binary Windows
- o Installation from Source
- o Creating a database cluster
- o Starting and Stopping the Server (Windows)
- o Starting and Stopping the Server (Other)
- o Lab Exercise - Installation
- o Install PostgreSQL from source
- o Create a database cluster
- o Start the database server
- o Connect to the server using psql
- o Stop the database server

Configuration

- o Setting PostgreSQL Parameters
- o Access Control
- o Connection Settings
- o Security and Authentication Settings
- o Memory Settings
- o Free Space Settings
- o Kernel Resource Settings
- o Log Management
- o Background Writer Settings
- o Vacuum Cost Settings
- o Autovacuum Settings

Creating and Managing PostgreSQL Databases

- o Object Hierarchy
- o Using SQL Interactive
- o Using PSQL

- o Starting and Stopping the Server (Windows)
- o Starting and Stopping the Server (pg_ctl)
- o Creating Databases
- o Creating Database Cluster
- o Creating Schemas
- o Schema Search Path
- o Roles
- o Users
- o Groups
- o COPY Command

Security

- o Levels of security: pg_conf, schemas and users and table level.
- o USERS
- o GROUPS
- o ROLES
- o Object Ownership
- o Access control
- o Application Access
- o pg_hba.conf
- o Schemas and Search Paths

Logging

- o What to log
- o Where to log
- o When to log
- o Log file naming
- o Log file rotation
- o Change Logging Parameters
- o DDL Logging
- o pgFouine Installation & Configuration
- o Logging Lab
- o What to log Lab
- o pgFouine Lab

Large Objects

- o Storing Large Objects
- o Managing Large Objects

Routine Database Maintenance Tasks

- o Backup & Recovery
- o Log Management
- o Routine Vacuuming

- o Recovering Disk Space
- o Vacuum Full
- o Updating Planner Statistics
- o Preventing Transaction ID Wraparound Failures
- o Routine Reindexing

Backup & Recovery

- o pg_dump
- o pg_restore
- o pg_dumpall
- o File System Backup - copying DATA folder
- o pg_start_backup and pg_stop_backup
- o PITR - Point in Time Recovery
- o Creating a base backup
- o Archive command
- o Recovery file parameters
- o Lab to test PITR

High Availability & Replication

- o Why Use Replication
- o Replication
- o Replication Limitations
- o Slonik
- o Replication Configuration

PGCluster

- o Installation & Configuration
- o Multi-Master Replication
- o Load Balancer
- o PGCluster Lab

Performance Tuning

- o Explain and Explain Analyze
- o Forcing Query Plan Selection
- o Indexing
- o Constraints
- o Clustering Rows

PostgreSQL Partitioning and Table spaces

- o Partition Methods
- o Partition Setup
- o Partition Table Explain Plan
- o Tablespace Management

Procedural Languages in PostgreSQL Database

- o PostgreSQL Procedural Languages
- o Anonymous Blocks
- o Declarations, Assignments, Printing output.
- o Functions
- o Triggers Procedures
- o Triggers
- o Viewing Source Code of Function

Introduction to PGAdmin3

- o Registering a server
- o Viewing and Editing Data
- o Query Tool
- o Databases
- o Languages
- o Schemas
- o Domains
- o Functions
- o Sequences
- o Tables
- o Columns
- o Constraints
- o Indexes
- o Maintenance
- o Rules
- o Triggers
- o Types
- o Views
- o Tablespaces
- o Roles

POSTGIS

- o What is PostGIS
- o Installation of PostGIS
- o Creation of spatial database
- o Shape Files
- o Load and retrieve data in a spatial database.
- o Using GIST indexes
- o Sample case study



Annexure B

Training on Linux

(15 Days)

Red Hat Linux Essentials

Overview

- o An introduction to fundamental end-user and administrative tools in Red Hat Enterprise Linux, designed for students with little or no command-line Linux or UNIX experience.

Audience:

- o Windows Professionals and Other Operating System Users
- o IT professionals who want to build user-level skills before learning Linux System and Network Administration.

Prerequisites:

- o User-level experience with any computer system, including: use of mouse, use of menus and use of any graphical user interface.

Topics:

Linux Ideas and History

- o An Introduction to Linux and Open Source: what are the central ideas behind the Linux phenomenon and where do they come from?

Linux Usage Basics

- o Logging into the system, changing users and editing text files.

Running Commands and Getting Help

- o How to use built-in and online documentation to enhance your experience.

Browsing the Filesystem

- o Understanding the locations of important directories on a Red Hat Enterprise Linux system and navigating them from the command line and using the graphical Nautilus browser.

Users, Groups and Permissions

- o Reading and setting permissions on files and directories.

Using the bash Shell

- o Basic tips and tricks to make Red Hat Enterprise Linux's default shell work for you. Topics include tab completion, history and an introduction to shell scripting.

Standard I/O and Pipes

- o The ins-and-outs of redirecting output between programs and files.

Text Processing Tools

- o An introduction to some of the most useful text-processing utilities in Red Hat Enterprise Linux, including grep, cut, sed, sort, diff and patch.

vim: An Advanced Text Editor

- o How to get the most out of the powerful and flexible vim text editor.

Basic System Configuration Tools

- o Using Red Hat Enterprise Linux's graphical and text-based configuration tools to manage networking, printing and date/time settings.

Investigating and Managing Processes

- o Listing, terminating and scheduling program executions on a Red Hat Enterprise Linux system.

Configuring the Bash Shell

- o A discussion of using shell variables and scripts to customize the command-line environment.

Finding Files

- o In-depth coverage of using the find command and related utilities to locate and act upon files based on arbitrary criteria.

Advanced Topics in Users, Groups and Permissions

- o A deeper discussion of how user and group identities are stored on a Red Hat Enterprise Linux system, as well as the introduction of advanced filesystem permissions like SetUID and SetGID.

Essential System

Administration Tools

- o An introduction to fundamental system administration topics such as installing Red Hat Enterprise Linux, managing software packages, and enhancing security with SELinux and the netfilter firewall.



Red Hat Linux System Administration

Overview

- For users of Linux (or UNIX) who want to start building skills in systems administration on Red Hat Linux, to a level where they can attach and configure a workstation on an existing network.

Audience:

- Linux or UNIX users, who understand the basics of Red Hat Linux, that desire further technical training to begin the process of becoming a system administrator.

Prerequisites:

- Red Hat Linux Essentials or equivalent experience with Red Hat Linux..

Topics:

Installation

- Hardware Overview
- CPU and Memory
- Preparing to Install
- Multiboot systems
- The RHEL Installer
- Installer Features
- RHEL Installation Overview
- Partitioning Hard Drives
- Sample Partition Structure
- Configuring File Systems
- Software RAID
- LVM: Logical Volume Manager
- Network Configuration
- Firewall Setup
- Security Enhanced Linux
- SELinux Installation Options and Control
- Package Selection
- Validating the Installation
- noprobe Mode and Driver Disks
- Post-Install Configuration
- **Hands-on Lab:** Installation

System Initialization and Services

- Boot Sequence Overview

- BIOS Initialization
- Boot Loader Components
- GRUB and grub.conf
- Kernel Initialization
- init Initialization
- Run levels
- /etc/rc.d/rc.sysinit
- /etc/rc.d/rc
- Daemon Processes
- System V run levels
- /etc/rc.d/rc.local
- Controlling Services
- System Shutdown
- System Reboot
- **Hands-on Lab:** Managing Startup

Kernel Services and Configuration

- Kernel Modules
- Kernel Module Configuration
- The /proc filesystem
- /proc/sys configuration with sysctl
- System Monitoring and Process Control
- **Hands-on Lab:** Configuring kernel parameters

Filesystem Management

- Disk Partitioning
- Managing Partitions
- Managing Data: Filesystem Creation
- Mount Options and Configuration
- ext2/ext3 Filesystem Attributes
- Virtual Memory Files
- Filesystem Maintenance
- Adding a Drive
- **Hands-on Lab:** Filesystem Management

RPM

- The RPM Way
- RPM Package Manager
- Installing and Removing Software
- Updating a Kernel RPM
- RPM Queries
- RPM Verification
- Other RPM Utilities and Features
- Hands-on Lab: RPM

User Administration

- User Policy Considerations

- The User Account Database - /etc/passwd
- Adding a New User Account
- Login Shell Scripts
- Non Login Shell Scripts
- sudo
- File Ownership
- Linux File Permissions
- Default File Permissions
- **Hands-on Lab:** User and Group Administration

Troubleshooting

- Basic Guidelines
- Troubleshooting X
- Troubleshooting Networking
- Order of the Boot Process
- Filesystem Corruption
- Filesystem Recovery
- Recovery Run-levels
- Rescue Environment
- **Hands-on Lab:** System Rescue and Troubleshooting

Apache Web Server

- Installation
- Download
- Source Code
- Binary Distribution
- Options
- Starting, stopping and restarting
- Configuration
- httpd.conf
- Modules
- MPM (Multi Process Modules)
- Directives
- Hosting more than one web sites.
- Binding
- Configuration Files
- Configuration Sections
- Content Caching
- Content Negotiation
- Dynamic Shared Objects (DSO)
- Environment Variables
- Log Files
- Mapping URLs to the Filesystem
- Performance Tuning
- Security Tips
- Server-Wide Configuration

CRONTAB

- Introduction
- Scheduling
- Using Crontab batches



Annexure C

Training on PHP

(15 Days)

PHP Foundation

Overview

- o In this PHP training course, students will learn to create database-driven websites using PHP and PostgreSQL. The class also covers some SQL basics.

Audience

- o New to Programming languages. Participants should have basics knowledge of websites.

Technical Requirements

- o **Operating Systems** : Linux RHEL 4 or higher , WindowsXP
- o Any Text or HTML Editor
- o **Web Server**: Apache, IIS
- o **Database Server**: PostgreSQL 8.3
- o PHP 5.2 or later
- o Internet Explorer 6.0 or Firefox

Objective

- o Learn how PHP works
- o Learn the basic syntax of PHP
- o Learn to create dynamic interactive pages with PHP
- o Learn to manipulate files with PHP
- o Learn to work with arrays in PHP
- o Learn to validate forms with PHP
- o Learn to write functions in PHP
- o Learn to manipulate and manage database data with PHP

- o Learn to authenticate users with PHP
- o Learn to manage sessions with PHP
- o Learn to work with the PEAR:DB module
- o Learn advanced form validation with regular expressions
- o Learn to send email with PHP
- o Understand how PostgreSQL works
- o Learn to use SQL to output reports with PostgreSQL
- o Learn to modify PostgreSQL data with SQL

Topics:

PHP Basics

- o How PHP Works
- o The php.ini File
- o Basic PHP Syntax
 - PHP Tags
 - PHP Statements and Whitespace
 - Comments
 - PHP Functions
 - Hello World!
 - PHP Tags
 - PHP Statements and Whitespace
 - Comments
 - PHP Functions
 - Hello World!
 - Variables
 - Variable Types
 - Variable Names (Identifiers)
 - Type Strength
 - Hello Variables!
 - Variable Scope
 - Superglobals

- Constants
- Variable-Testing and Manipulation Functions
- Variable Types
- Variable Names (Identifiers)
- Type Strength
- Hello Variables!
- Variable Scope
- Superglobals
- Constants
- Variable-Testing and Manipulation Functions
- PHP Operators
- o Creating Dynamic Pages
 - Single Quotes vs. Double Quotes
 - Howdy World!
 - Single Quotes vs. Double Quotes
 - Howdy World!

Flow Control

- o Conditional Processing
 - If Conditions
 - If Conditions
- o Loops
 - while
 - do...while
 - for
 - break and continue
 - while
- o do...while
- o for
- o break and continue

Arrays

- o Enumerated Arrays
- o Initializing Arrays
- o Appending to an Array
- o Reading from Arrays
- o Looping through Arrays
- o Initializing Arrays
- o Appending to an Array

- o Reading from Arrays
- o Looping through Arrays
- o Associative Arrays
- o Initializing Associative Arrays
- o Reading from Associative Arrays
- o Looping through Associative Arrays
- o Superglobal Arrays
- o Initializing Associative Arrays
- o Reading from Associative Arrays
- o Looping through Associative Arrays
- o Superglobal Arrays
- o Two-dimensional Arrays
- o Reading from Two-dimensional Arrays
- o Looping through Two-dimensional Arrays
- o Reading from Two-dimensional Arrays
- o Looping through Two-dimensional Arrays
- o Array Manipulation Functions

PHP and HTML Forms

- o HTML Forms
- o How HTML Forms Work
- o A Sample HTML Form
- o Form Variables
- o How HTML Forms Work
- o A Sample HTML Form
- o Form Variables

String Manipulation

- o Formatting Strings
- o Concatenation
- o String Manipulation Functions
- o Examples of String Functions
- o Concatenation
- o String Manipulation Functions
- o Examples of String Functions
- o Magic Quotes
- o magic_quotes_gpc
- o magic_quotes_runtime
- o Recommendation on Magic Quotes
- o Conclusion

- o magic_quotes_gpc
- o magic_quotes_runtime
- o Recommendation on Magic Quotes

Reusing Code and Writing Functions

- o Including Files
- o require
- o require_once
- o auto_prepend_file and auto_append_file
- o require
- o require_once
- o auto_prepend_file and auto_append_file
- o User Functions
- o Defining and Calling Functions
- o Default Values
- o Variable Scope
- o By Reference vs. By Value
- o Defining and Calling Functions
- o Default Values
- o Variable Scope
- o By Reference vs. By Value
- o Form Processing
- o Code Organization
- o Code Organization

Simple SELECTs

- o Some Basics
- o Comments
- o Whitespace and Semi-colons
- o Case Sensitivity
- o Comments
- o Whitespace and Semi-colons
- o Case Sensitivity
- o SELECTing All Columns in All Rows
- o SELECTing Specific Columns
- o Sorting Records
- o Sorting By a Single Column
- o Sorting By Multiple Columns
- o Sorting By Column Position
- o Ascending and Descending Sorts
- o Sorting By a Single Column
- o Sorting By Multiple Columns
- o Sorting By Column Position

- o Ascending and Descending Sorts
- o The WHERE Clause and Operator Symbols
- o Checking for Equality
- o Checking for Inequality
- o Checking for Greater or Less Than
- o Checking for NULL
- o WHERE and ORDER BY
- o Checking for Equality
- o Checking for Inequality
- o Checking for Greater or Less Than
- o Checking for NULL
- o WHERE and ORDER BY
- o The WHERE Clause and Operator Words
- o The BETWEEN Operator
- o The IN Operator
- o The LIKE Operator
- o The NOT Operator
- o The BETWEEN Operator
- o The IN Operator
- o The LIKE Operator
- o The NOT Operator
- o Checking Multiple Conditions
- o AND
- o OR
- o Order of Evaluation
- o AND
- o OR
- o Order of Evaluation

Subqueries, Joins and Unions

- o Subqueries
- o Joins
- o Table Aliases
- o Multi-table Joins
- o Table Aliases
- o Multi-table Joins
- o Outer Joins
- o Unions
- o UNION ALL
- o UNION Rules
- o UNION ALL
- o UNION Rules



Inserting, Updating and Deleting Records

- o INSERT
- o UPDATE
- o DELETE

Managing Data

- o Querying a Database
- o PostgreSQL() Overview
- o PostgreSQL Methods and Properties
- o Inserting and Updating Records
- o PostgreSQL Prepared Statements

PostgreSQL() Overview

- o PostgreSQL Methods and Properties
- o Inserting and Updating Records
- o PostgreSQL Prepared Statements

PEAR:DB

- o Advantages and Disadvantages of PEAR DB
- o Why use a database abstraction layer?
- o When not to use a database abstraction layer?
- o Why use a database abstraction layer?
- o When not to use a database abstraction layer?
- o Using PEAR DB

Authentication with PHP and SQL

- o A Database-less Login Form

Regular Expressions

- o Perl-compatible Regular Expression Functions
- o preg_match()
- o preg_replace()

- o Regular Expression Tester
- o preg_match()
 - preg_replace()
 - Regular Expression Tester
 - Regular Expression Syntax
 - Start and End (^ \$)
 - Number of Occurrences (? + * { })
 - Common Characters (. \d \D \w \W \s \S)
 - Grouping ([])
 - Negation (^)
 - Subpatterns (())
 - Alternatives (|)
 - Escape Character (\)
- o Start and End (^ \$)
 - Number of Occurrences (? + * { })
 - Common Characters (. \d \D \w \W \s \S)
 - Grouping ([])
 - Negation (^)
 - Subpatterns (())
 - Alternatives (|)
 - Escape Character (\)
 - Form Validation Functions with Regular Expressions

Session Control and Cookies

- o Sessions
- o Configuring Sessions
- o Session Functions
- o Cookies

Sending Email with PHP

- o mail()
- o Shortcomings of mail()
- o Shortcomings of mail()
- o PHPMailer

File System Management

- o Opening a File
- o fopen()
- o fopen()
- o Reading from a File
- o fgets()
- o fgets()
- o Writing to a File

- o fwrite()
- o fwrite()
- o File Locking
- o flock()
- o flock()
- o Uploading Files via an HTML Form
- o Getting File Information
- o More File Functions
- o Directory Functions
- o Getting a Directory Listing
- o Getting a Directory Listing

Advanced PHP

Overview

- o In this advanced PHP training course, students will learn advanced features of the PHP web programming language, its extensions and open source libraries for XML processing. As the technical web programming paradigm changes, more layers of abstractions are introduced by the PHP open source community. This course takes a deep dive into those areas such as XML/XSLT, XML-RPC, Smarty Templates, Web Services, Ajax and many more. This PHP course also explores the built-in advanced Object Oriented language constructs and looks at some of the best practices with all of the advanced technologies combined.

Audience:

- o Experience in the following areas is required:
 - PHP
- o Experience in the following areas would be beneficial.
 - XML

Technical Requirements

- o **Operating Systems** : Linux RHEL 4 or higher , WindowsXP



- o Any Text or HTML Editor
- o **Web Server** : Apache, IIS
- o **Database Server**: PostgreSQL 8.3
- o PHP 5.2 or later
- o Internet Explorer 6.0 or Firefox

Objective

- o Learn how to program in Object-Oriented PHP
- o Learn to process XML with PHP
- o Learn to work with the PEAR HTTP_REQUEST Module
- o Learn to work with XML RPC and PHP
- o Learn to create PHP Web Services
- o Learn to work with Smarty Templates to speed up PHP development

Topics:

Object-Oriented PHP

- o Building a Class
- o Working with Properties and Functions
- o Private, Protected, Public modifiers
- o Inheritance
- o Interfaces
- o Building a Web Page Object
- o PHP Objects in N-Tier Web Architecture
- o Importance of PHP Business Objects

PHP XML Support

- o Simple XML Object
- o Executing XPath Queries
- o DOM Interoperability
- o Using XPath
- o Installing and Configuring LIBXSL
- o Applying Server side XSL Transformations
- o Using XML in N-Tier Architecture
- o Mixing PHP Objects and XML

PEAR: HTTP_REQUEST MODULE

- o Installing PEAR::HTTP_REQUEST with Dependencies
- o HTTP_REQUEST Capability
- o HTTP_GET Request
- o HTTP POST Request
- o Programmatically Posting to a HTML Form
- o Parsing the Response
- o Building a Basic Authentication PHP Client

XML RPC

- o XML-RPC Implementations
- o Installing and Configuring PHPXMLRPC
- o XML RPC Data-Types
- o XML RPC Server
- o XML RPC Client
- o XML RPC Request and Response
- o Exploring the XML RPC API

PHP Web Services

- o Web Service Technology Stack
- o SOAP Soup
- o Web Services with PHP
- o Installing NuSOAP
- o Building a SOAP SERVER
- o Consuming a Web Service
- o Generating WSDL Dynamically
- o Understanding Generated WSDL
- o WSDL and SOAP Proxies

Complex PHP Web Services

- o Building Interoperable Web Services
- o Generating and Handling SOAP Faults
- o RPC Vs. Document Message Encoding
- o Serializing the SOAP Envelope
- o Web Service Best Practices

Ajax with PHP

- o Ajax Overview
- o Ajax Technology Stack
- o Ajax Implementations
- o Installing and configuring HTML_Ajax Pear Module
- o Ajax Server
- o Ajax Client

Smarty Templates

- o Smarty Overview
- o Installing and configuring Smarty Pear Module
- o Setting up a Template
- o Passing Data to the Template
- o Smarty for Template Designers
- o Smarty for Programmers
- o Smarty in N-Tier Architecture

Installation

- o Hardware Overview
- o CPU and Memory
- o Preparing to Install
- o Multiboot systems
- o The RHEL Installer
- o Installer Features
- o RHEL Installation Overview
- o Partitioning Hard Drives
- o Sample Partition Structure
- o Configuring File Systems
- o Software RAID
- o LVM: Logical Volume Manager
- o Network Configuration
- o Firewall Setup
- o Security Enhanced Linux
- o SELinux Installation Options and Control
- o Package Selection
- o Validating the Installation
- o noprobe Mode and Driver Disks
- o Post-Install Configuration
- o **Hands-on Lab**: Installation

System Initialization and Services

- o Boot Sequence Overview
- o BIOS Initialization
- o Boot Loader Components



- o GRUB and grub.conf
- o Kernel Initialization
- o init Initialization
- o Run levels
- o /etc/rc.d/rc.sysinit
- o /etc/rc.d/rc
- o Daemon Processes
- o System V run levels
- o /etc/rc.d/rc.local
- o Virtual Consoles
- o Controlling Services
- o System Shutdown
- o System Reboot
- o **Hands-on Lab:** Managing Startup

Kernel Services and Configuration

- o Objectives
- o Agenda
- o Kernel Modules
- o Kernel Module Configuration
- o The /proc filesystem
- o /proc/sys configuration with sysctl
- o **Hands-on Lab:** Configuring kernel parameters

Filesystem Management

- o System Initialization: Device Recognition
- o Disk Partitioning
- o Managing Partitions
- o Managing Data: Filesystem Creation
- o Mount Options and Configuration
- o Virtual Memory Files
- o Filesystem Maintenance
- o Adding a Drive
- o **Hands-on Lab:** Filesystem Management

RPM

- o The RPM Way
- o RPM Package Manager
- o Installing and Removing Software
- o Updating a Kernel RPM
- o RPM Queries
- o RPM Verification

- o Other RPM Utilities and Features
- o **Hands-on Lab:** RPM

User Administration

- o User Policy Considerations
- o The User Account Database - /etc/passwd
- o Adding a New User Account
- o Login Shell Scripts
- o Non Login Shell Scripts
- o Switching Accounts
- o Network Users
- o Authentication Configuration
- o File Ownership
- o Linux File Permissions
- o Default File Permissions
- o **Hands-on Lab:** User and Group Administration

Administration Tools

- o Controlling Access to cron
- o System crontab Files
- o System Logging
- o syslog Configuration
- o Tape Drives
- o Using tar/star
- o Using dump/restore
- o Remote Backups
- o **Hands-on Lab:** Admin Tools

Troubleshooting

- o Basic Guidelines
- o Troubleshooting X
- o Troubleshooting Networking
- o Order of the Boot Process
- o Filesystem Corruption
- o Filesystem Recovery
- o Recovery Run-levels
- o Rescue Environment
- o **Hands-on Lab:** System Rescue and Troubleshooting

Registration Details

Course Commences on:
20th July 2009

Last Date for Registrations: 15th July 2009

Course Duration: 50 days

Course Fee: Rs.10,000/-

PI note: There is no course fee applicable to candidates nominated by the Government, Universities, and State and National Institutions. The concerned departments should forward the registration form of such candidates.

Mode of Payment: By Demand Draft favouring "Commissioner AMR-APARD" payable at Hyderabad

Please mail the filled up form with DD to

The Joint Director
AMR - Andhra Pradesh
Academy of Rural Development
Rajendranagar, Hyderabad -
500 030
Andhra Pradesh, India

Prerequisites: Applicants should have functional experience in any programming language and database





AMR - Andhra Pradesh Academy of Rural Development

AMR-APARD,
Rajendranagar,
Hyderabad – 500 030

www.apard.gov.in

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