| **File name** | YouTestMe Deployment Appliance Manual |
| --- | --- |
| **Author** | Malloc Inc. |
| **Last save date** | Monday, July-18-2022 at 5:43:00 PM |
| **Security** | Internal |

Contents

[1 Introduction 9](#_Toc77782734)

[2 Virtual Machine Naming Convention 10](#_Toc77782735)

[3 Objectives 11](#_Toc77782736)

[4 System requirements 11](#_Toc77782737)

[4.1 Hardware 11](#_Toc77782738)

[4.2 Required Software 11](#_Toc77782739)

[4.2.1 Required to run YTM appliance 12](#_Toc77782740)

[4.2.2 Required to build YTM appliance 12](#_Toc77782741)

[5 VM Hosting Options 12](#_Toc77782742)

[6 Accessing YTM Deployment Appliance 12](#_Toc77782743)

[7 Initial Configuration 14](#_Toc77782744)

[7.1 Change to Static IP Address 14](#_Toc77782745)

[8 Linux Kernel 14](#_Toc77782746)

[9 Multi Tenant Architecture 14](#_Toc77782747)

[9.1 UNIX users 15](#_Toc77782748)

[9.1.1 Create deployment users 15](#_Toc77782749)

[10 Global System Variables 16](#_Toc77782750)

[11 Global Aliases 17](#_Toc77782751)

[12 VirtualBox Guest Additions 17](#_Toc77782752)

[13 Customizing GDM Log in Screen and Desktop 18](#_Toc77782753)

[13.1.1 Disabling the Login Screen User List 18](#_Toc77782754)

[14 Yum 18](#_Toc77782755)

[15 Installing SVN client 19](#_Toc77782756)

[15.1.1 Checking out code from SVN 19](#_Toc77782757)

[15.2 Checking out code from branch – Example 19](#_Toc77782758)

[16 Configuring Oracle 19](#_Toc77782759)

[16.1 Configuring SQL\*Net 19](#_Toc77782760)

[16.2 Default Database Users 20](#_Toc77782761)

[16.2.1 Oracle enterprise manager 20](#_Toc77782762)

[16.2.2 Configuring SQL\*Net using “Net Manager” 20](#_Toc77782763)

[16.2.3 Oracle Environment Variables 24](#_Toc77782764)

[16.2.4 Database Character Set 24](#_Toc77782765)

[16.2.5 Changing SYSTEM and SYS passwords 25](#_Toc77782766)

[16.2.6 Change Password Expiration Period 25](#_Toc77782767)

[16.2.7 Switching to ARCHIVELOG Mode is not required 25](#_Toc77782768)

[16.2.8 Setting Timezone for Database User 26](#_Toc77782769)

[16.2.9 Export data from other database 27](#_Toc77782770)

[16.2.10 Initial data Load 27](#_Toc77782771)

[16.2.11 Demo Data Load 27](#_Toc77782772)

[16.2.12 Import Initial data from export file 28](#_Toc77782773)

[16.2.13 Database Connections 28](#_Toc77782774)

[16.3 Resizing Oracle Data Files 29](#_Toc77782775)

[16.4 Limit Oracle Data file Size 30](#_Toc77782776)

[16.5 Adding new Oracle data file to the tablespace 30](#_Toc77782777)

[16.6 Removing datafile 30](#_Toc77782778)

[16.6.1 Getting Database Password Store in Protected File 30](#_Toc77782779)

[16.7 Setting automatic database statistic update 31](#_Toc77782780)

[16.8 Managing Oracle Memory 31](#_Toc77782781)

[16.8.1 Set memory\_max\_target parameter 31](#_Toc77782782)

[16.9 Limit size of the Oracle dump files 31](#_Toc77782783)

[16.10 Clean old Oracle trace files 32](#_Toc77782784)

[17 Creating database directory for "Data Pump" Oracle Utility 32](#_Toc77782785)

[17.1 Sample data export script using Data Pump 32](#_Toc77782786)

[18 SQL Developer 33](#_Toc77782787)

[18.1.1 External connection over the Internet 33](#_Toc77782788)

[18.1.2 Fix SQL\*Developer after System upgrade 33](#_Toc77782789)

[18.2 Fix SQL\*Developer after System upgrade 34](#_Toc77782790)

[18.3 SQL\*Plus 34](#_Toc77782791)

[19 Usage 35](#_Toc77782792)

[20 Software Components 35](#_Toc77782793)

[21 Relevant Links 36](#_Toc77782794)

[22 YTM Deployment Block Diagram 37](#_Toc77782795)

[23 Online System Requests 38](#_Toc77782796)

[23.1 Setting up the database for System requests 39](#_Toc77782797)

[23.2 Setting the crontab 39](#_Toc77782798)

[23.2.1 Alternative – Manually creating crontab files 40](#_Toc77782799)

[23.3 Requesting Automated Build and Deployment – Example 40](#_Toc77782800)

[24 Initial Data Load 43](#_Toc77782801)

[24.1 Excel Spreadsheets Templates 43](#_Toc77782802)

[25 YTM Application Users 43](#_Toc77782803)

[26 Initial Data Load 43](#_Toc77782804)

[26.1 File Locations 43](#_Toc77782805)

[26.2 Load Process 43](#_Toc77782806)

[27 YTM Application Setup 43](#_Toc77782807)

[27.1 Create symbolic link to proper configuration files 43](#_Toc77782808)

[27.2 Change Application Database Connection Parameters 44](#_Toc77782809)

[28 Building and deploying YTM application 44](#_Toc77782810)

[29 Common Tomcat Tasks 45](#_Toc77782811)

[29.1 Starting Tomcat and YTM Application 45](#_Toc77782812)

[29.1.1 As user "root" 45](#_Toc77782813)

[29.1.2 Starting Tomcat using "init.d" settings 45](#_Toc77782814)

[29.2 Troubleshooting Linux and Oracle start-up 46](#_Toc77782815)

[29.2.1 Important Log Files 46](#_Toc77782816)

[29.3 Stopping Tomcat 46](#_Toc77782817)

[29.3.1 As user "root" 46](#_Toc77782818)

[29.3.2 Stopping Tomcat using "init.d" settings 46](#_Toc77782819)

[29.3.3 Tomcat Upgrade 47](#_Toc77782820)

[29.4 Manually deploy war file 48](#_Toc77782821)

[29.5 Checking Tomcat Log File 48](#_Toc77782822)

[29.6 Accessing YTM Application 48](#_Toc77782823)

[30 Starting Application at boot 49](#_Toc77782824)

[30.1 Removing start application and Oracle from Linux boot 49](#_Toc77782825)

[31 Installing required fonts 49](#_Toc77782826)

[31.1 Link to the original documentation 50](#_Toc77782827)

[31.2 Executing fontInstall.sh script 50](#_Toc77782828)

[31.3 Testing the installation of fonts 50](#_Toc77782829)

[32 Controlling application settings from the admin dashboard 50](#_Toc77782830)

[32.1 Email settings 50](#_Toc77782831)

[32.2 Rebuilding the system 51](#_Toc77782832)

[32.3 Setting the internal network 52](#_Toc77782833)

[33 Running Common Commands on all YTM Applications 52](#_Toc77782834)

[34 Running Common Commands on some of YTM Applications 53](#_Toc77782835)

[35 Create YTM Application – Quick Start 53](#_Toc77782836)

[35.1 Step #1 – Create user ytm3 54](#_Toc77782837)

[35.2 Step #2 – get the code from SVN 55](#_Toc77782838)

[35.3 Step #3 – Build YTM Application 55](#_Toc77782839)

[36 Directory Structures 55](#_Toc77782840)

[36.1 User “root” 55](#_Toc77782841)

[36.2 User “ytm\*” 57](#_Toc77782842)

[37 Relevant Links 58](#_Toc77782843)

[38 Send Email From Linix Command Line 58](#_Toc77782844)

[38.1 Configuration 58](#_Toc77782845)

[38.2 Useful tip 59](#_Toc77782846)

[39 Troubleshooting 59](#_Toc77782847)

[39.1 Checking Tomcat Log 59](#_Toc77782848)

[39.2 Tomcat could not be stopped 60](#_Toc77782849)

[39.3 Automated build does not work 60](#_Toc77782850)

[39.4 Oracle account is locked 60](#_Toc77782851)

[39.5 Dropping public synonyms from the database 61](#_Toc77782852)

[39.6 VM Clipboard does not work 61](#_Toc77782853)

[39.7 Troubleshooting procedures 61](#_Toc77782854)

[39.8 Create new database 61](#_Toc77782855)

[39.9 Load data 61](#_Toc77782856)

[39.10 Implementation 62](#_Toc77782857)

[39.11 Testing mail server with Python script 62](#_Toc77782858)

[39.12 Problem with sending mails from application 63](#_Toc77782859)

[39.13 Checking build log 63](#_Toc77782860)

[39.14 How to collect important system information from VM 63](#_Toc77782861)

[39.15 How to fix VirtualBox Clipboard not working 64](#_Toc77782862)

[40 How to resize a partition using fdisk 65](#_Toc77782863)

[41 Tomcat native APR 67](#_Toc77782864)

[41.1 Install tomcat library using bash scripts 67](#_Toc77782865)

[41.2 Install tomcat library step by step 68](#_Toc77782866)

[42 Using Log4j 68](#_Toc77782867)

[43 Converting VirtualBox Appliance to VMware 69](#_Toc77782868)

[43.1 Export VM appliance from VirtualBox 69](#_Toc77782869)

[43.1.1 Start VMware Workstation 69](#_Toc77782870)

[43.1.2 Import VirtualBox “\*.OVA” file 70](#_Toc77782871)

[43.1.3 Disable “vboxclient” so it does not run on server start-up. 70](#_Toc77782872)

[43.1.4 Change IP Address 71](#_Toc77782873)

[43.1.5 Install VMware Tools 72](#_Toc77782874)

[43.1.6 VMware version used for this conversion 73](#_Toc77782875)

[44 Automate Application Start-up 73](#_Toc77782876)

[45 Start VM on boot 74](#_Toc77782877)

[46 Relocating repository 74](#_Toc77782878)

[47 Building Android Application 75](#_Toc77782879)

[48 Extended Data Types with VARCHAR2(32767) 75](#_Toc77782880)

[48.1 Documentation 75](#_Toc77782881)

[48.2 Impact 76](#_Toc77782882)

[48.3 Procedure 76](#_Toc77782883)

[49 Adding additional hard disks 76](#_Toc77782884)

[50 Enabling UTL\_MAIL package 77](#_Toc77782885)

[51 SFTP Server 78](#_Toc77782886)

[52 Configure Tiger VNC Server 79](#_Toc77782887)

[52.1.1 Install VNC server: 79](#_Toc77782888)

[52.1.2 Configure VNC server for two users: 79](#_Toc77782889)

[52.1.3 Starting VNC Server and enable start on boot 79](#_Toc77782890)

[52.2 Configuring access for user “root” 79](#_Toc77782891)

[52.3 Configuring access for user “ytm1” 80](#_Toc77782892)

[53 Install Sublime text editor 82](#_Toc77782893)

[54 Tomcat Configuration 82](#_Toc77782894)

[54.1 Tomcat Connection Pools and Connector configuration 82](#_Toc77782895)

[54.2 JVM Configuration 82](#_Toc77782896)

[55 Security hardening 83](#_Toc77782897)

[55.1 Check failed log in attempts 83](#_Toc77782898)

[55.2 Firewall – IPTables 83](#_Toc77782899)

[55.3 Enable Authentication for Single-user mode 85](#_Toc77782900)

[55.4 Disable interactive hotkey startup at boot 85](#_Toc77782901)

[55.5 Disable time-out for login shells 85](#_Toc77782902)

[55.5.1 SSH Access 86](#_Toc77782903)

[55.5.2 Adding banner (log in message) 87](#_Toc77782904)

[55.5.3 Changing the default SSH port 88](#_Toc77782905)

[55.5.4 Account locking 89](#_Toc77782906)

[55.5.5 Making SSH session permanently alive 90](#_Toc77782907)

[55.6 Keep “/boot” as read-only 90](#_Toc77782908)

[55.7 Ignore ICMP or Broadcast requests 90](#_Toc77782909)

[55.8 Add message at user log in 90](#_Toc77782910)

[55.9 Install ClamAV antivirus software 90](#_Toc77782911)

[55.9.1 Schedule weekly scan 91](#_Toc77782912)

[56 Default Oracle Users 92](#_Toc77782913)

[57 Client Pre-Delivery Tasks 98](#_Toc77782914)

[57.1 Pre-delivery check list - Short list 98](#_Toc77782915)

[57.2 Check for duplicate IP address 98](#_Toc77782916)

[57.3 Increase RAM 98](#_Toc77782917)

[57.4 Increase swap space 98](#_Toc77782918)

[57.5 Change size of temporary file storage 99](#_Toc77782919)

[57.6 Limit the Size of Tomcat Log Files 99](#_Toc77782920)

[57.7 Empty Linux recyclebin 99](#_Toc77782921)

[57.8 Purge Database recyclebin 99](#_Toc77782922)

[57.9 Update database statistics 99](#_Toc77782923)

[57.10 Check O/S free disk space 99](#_Toc77782924)

[57.11 Purge logs and temporary files 99](#_Toc77782925)

[57.12 Clean yum cache 99](#_Toc77782926)

[57.13 Virus Scan 99](#_Toc77782927)

[57.14 Reboot VM ad Perform sanity check 100](#_Toc77782928)

[57.14.1 Verify that application can be accessed on default IP and port 100](#_Toc77782929)

[57.14.2 Verify that tomcat process is running 100](#_Toc77782930)

[57.14.3 Try to access application on local host URL 100](#_Toc77782931)

[57.14.4 Edit VM Settings Information 100](#_Toc77782932)

[57.15 Zip VM using 7Zip format 101](#_Toc77782933)

[57.16 Copy VM to S Drive for backup 101](#_Toc77782934)

[57.17 Upload VM File to FTP Site 101](#_Toc77782935)

[57.18 Download VM from FTP Site and perform Sanity Check 101](#_Toc77782936)

[57.19 Fill in delivery inventory 101](#_Toc77782937)

[57.20 Check tasks from other document 101](#_Toc77782938)

[58 Clients VM Hosted by YouTestMe 101](#_Toc77782939)

[58.1 Hosting Strategy 102](#_Toc77782940)

[58.2 Naming conventions 102](#_Toc77782941)

[58.3 Backup Strategy 102](#_Toc77782942)

[58.3.1 Requirements 102](#_Toc77782943)

[58.3.2 Implementation 102](#_Toc77782944)

[58.4 Tightening Access to Oracle Database 104](#_Toc77782945)

[58.4.1 Limit Oracle access by IP addresses 104](#_Toc77782946)

[58.5 Tightening Access to Client’s VM 104](#_Toc77782947)

[58.6 Assigning URL 105](#_Toc77782948)

[59 Creating Standby Site 106](#_Toc77782949)

[60 Installing and Configuring Postgres Database 107](#_Toc77782950)

[60.1 Install the software 107](#_Toc77782951)

[60.2 Edit configuration files 107](#_Toc77782952)

[60.3 Connect to database 107](#_Toc77782953)

[60.4 Database Objects 108](#_Toc77782954)

[60.5 Database Connection in SQL\*Developer 109](#_Toc77782955)

[60.6 Move PostgreSQL Data to Larger Partition 109](#_Toc77782956)

[60.7 PostgreSQL Connection Over SSL 110](#_Toc77782957)

[60.7.1 Useful Links 110](#_Toc77782958)

[61 GUI Customization 111](#_Toc77782959)

[61.1 Login Screen Logo 111](#_Toc77782960)

[61.2 Wallpaper Image 111](#_Toc77782961)

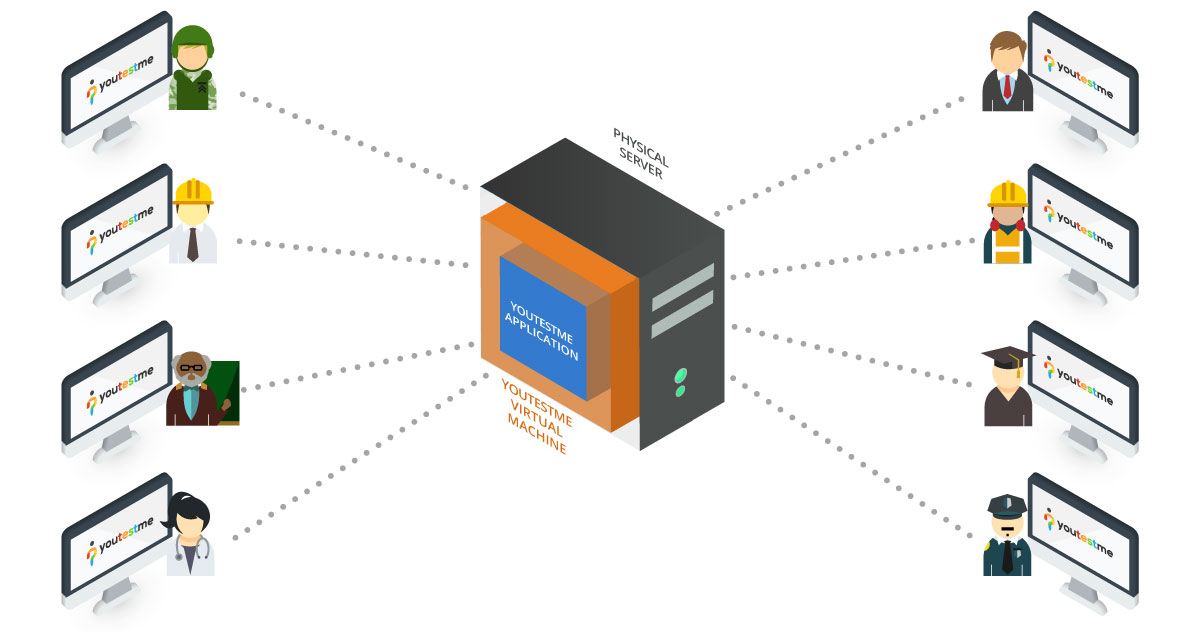
[61.3 Application Icon Replacement 111](#_Toc77782962)

# Introduction

The purpose of this document is to describe how to build and use YTM Standard Deployment appliance.

What make this appliance standard are the following design guidelines:

1. VM will have 10 independent YTM application deployments
2. Each instance of application will run under its own OS id and in its own database schema
3. Naming for each OS user owing respective application will be ytm1, ytm2, ...ytm10
4. Database schema names for respective applications are ytm1, ytm2, ...ytm10
5. HTTP ports used for accessing applications are 9001, 9002, ....9010



# Virtual Machine Naming Convention

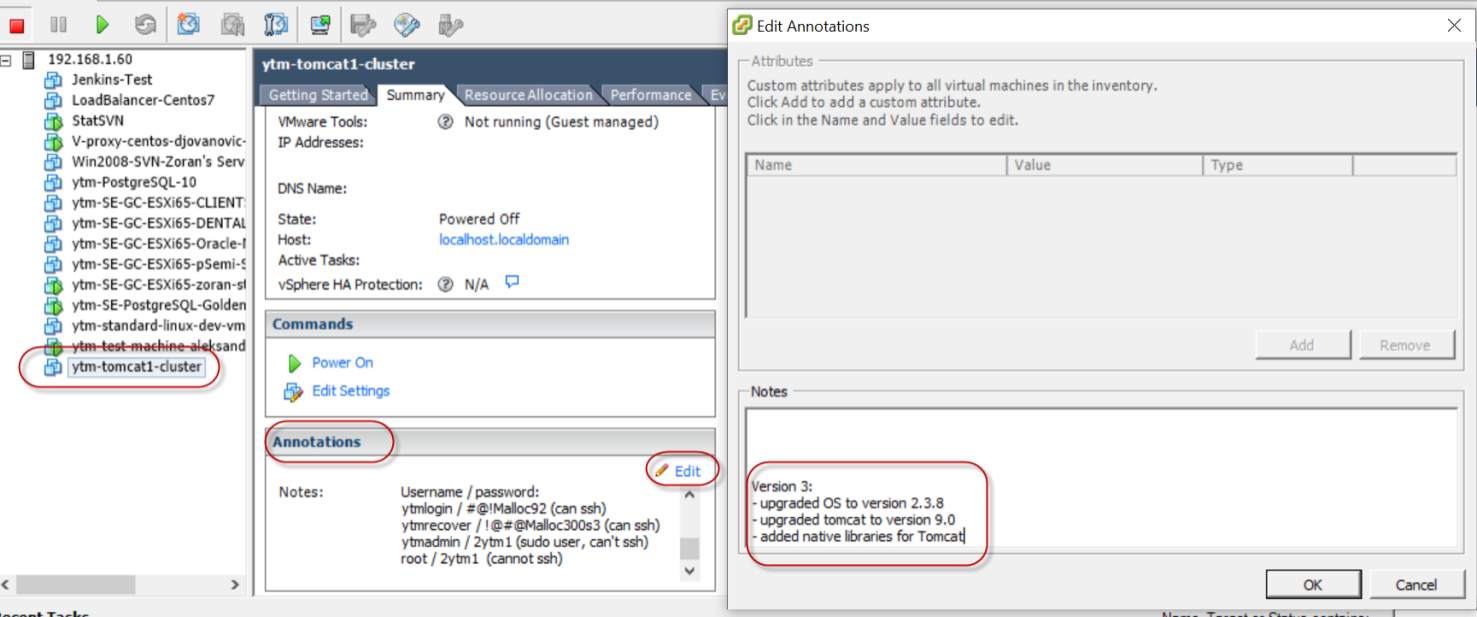
Name consists of these elements:

1. String “YTM”
2. Machine type code
3. “V” + Machine version. Numbers following letter “V” in table below are there just for example.

| **#** | **VM Name** | **Description** |
| --- | --- | --- |
|  | YTM-STANDARD-V*31* | Standard YTM VM with app server and the database with standard version of software. |
|  | YTM-LOADBALANCER-V21 | Load balancer/proxy server. |
|  | YTM-APPSERVER-V3 | YTM application server |
|  | YTM-DBPRIMARY-V12 | Primary Postgres database server |
|  | YTM-DBSTANDBY-V4 | Standby Postgres database server |
|  | YTM-DBPRIMARYTDE-V2 | Primary Postgres database server with TDE |
|  | YTM-DBSTANDBYTDE-V3 | Standby Postgres database server with TDE |
|  | YTM-ISSUETRACKING-V*1* | Issue tracking system (Bugzilla) |
|  | YTM-PROCTOR-V5 | Proctoring system. |

YTM Enterprise version is composed of combination of virtual machines 2-7.

Version specific details should be put in VM Annotation (Picture below)



# Objectives

The objective is to create:

1. “One click” installation and YTM Appliance setup
2. “Black box” and zero maintenance YTM Appliance for the end user by performing automated actions and doing self maintenance.

Perform automated:

1. svn code update build and deployment.
2. backup of database and files
3. upgrade of the database data model and initial data set
4. svn cleanup and code refresh
5. notification about various events
6. receive instructions in some format (email, svn file, by checking ftp site) and perform actions
7. reporting on system health and available capacity (i.e. remaining disk space) and sending reports by email to subscribers
8. reporting about the database including application data and system data
9. database maintenance such as updating statistics, recompiling stored procedures, rebuilding indexes, recycling database, etc.

# System requirements

## Hardware

| **Hardware** | **Minimal** | **Recommended** |
| --- | --- | --- |
| CPU (physical) | Dual core CPU | Four Core Server Grade CPU |
| RAM (DDR3) | 8GB | 16GB |
| HDD | 80GB | 200GB |
| Internet Connection | yes | yes |

## Required Software

YouTestMe virtual machine image contain an Oracle Linux operating system, Oracle Database and a fully configured YouTestMe application stack. Running virtual machine images requires a hypervisor such as VMware or VirtualBox.

### Required to run YTM appliance

Install Virtual Box software:

<http://www.oracle.com/technetwork/server-storage/virtualbox/downloads/index.html>

### Required to build YTM appliance

Download and install this appliance:

<http://www.oracle.com/technetwork/database/enterprise-edition/databaseappdev-vm-161299.html>

Other Prebuilt appliances (good to know):

<http://www.oracle.com/technetwork/community/developer-vm/index.html>

# VM Hosting Options

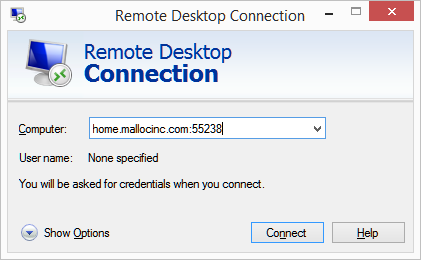
YouTestMe virtual machine can be easily hosted in house or at some of the service providers such as:

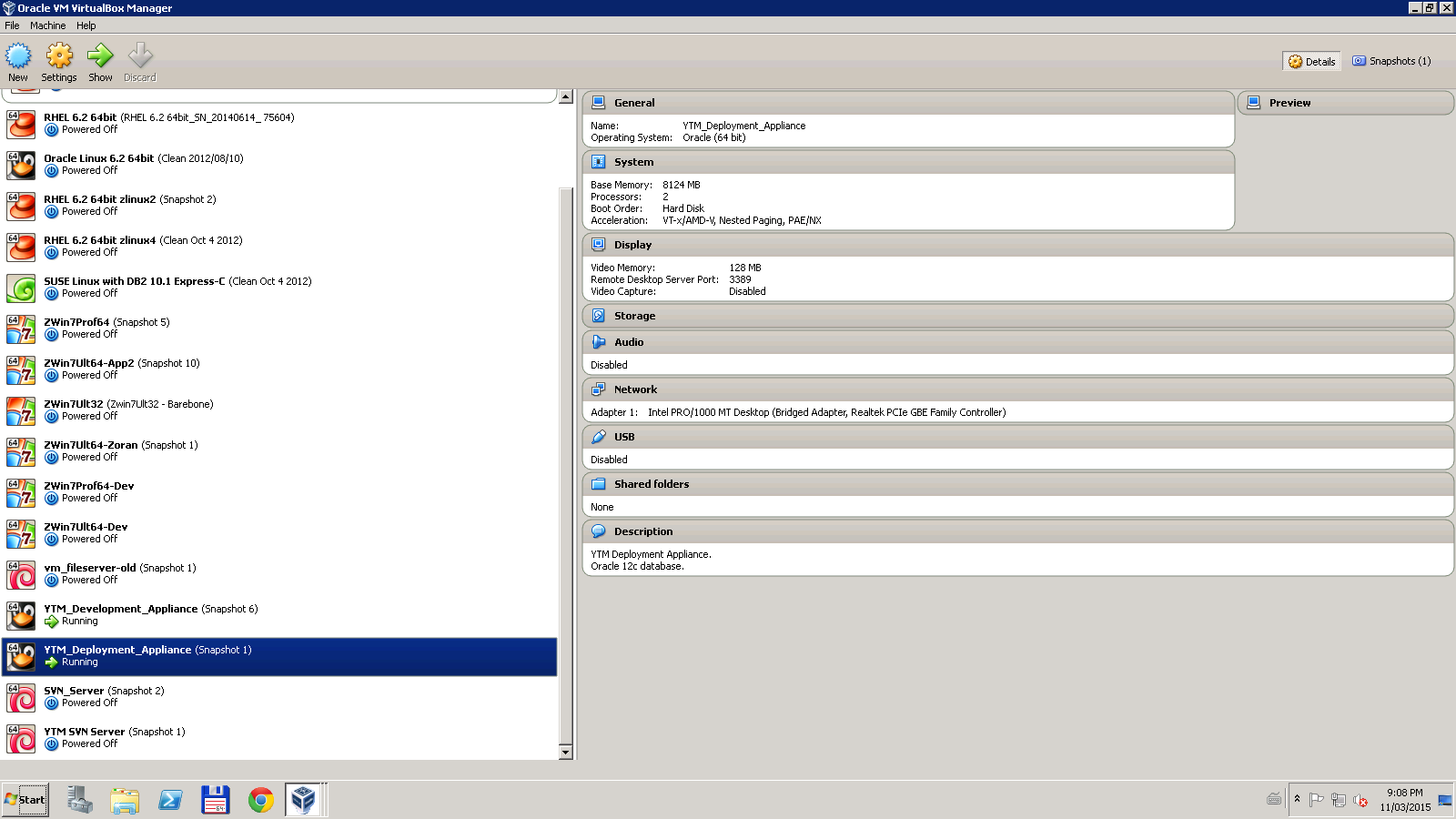
<http://www.radiant.net/ec-vcloud.php> (Markham, Ontario)

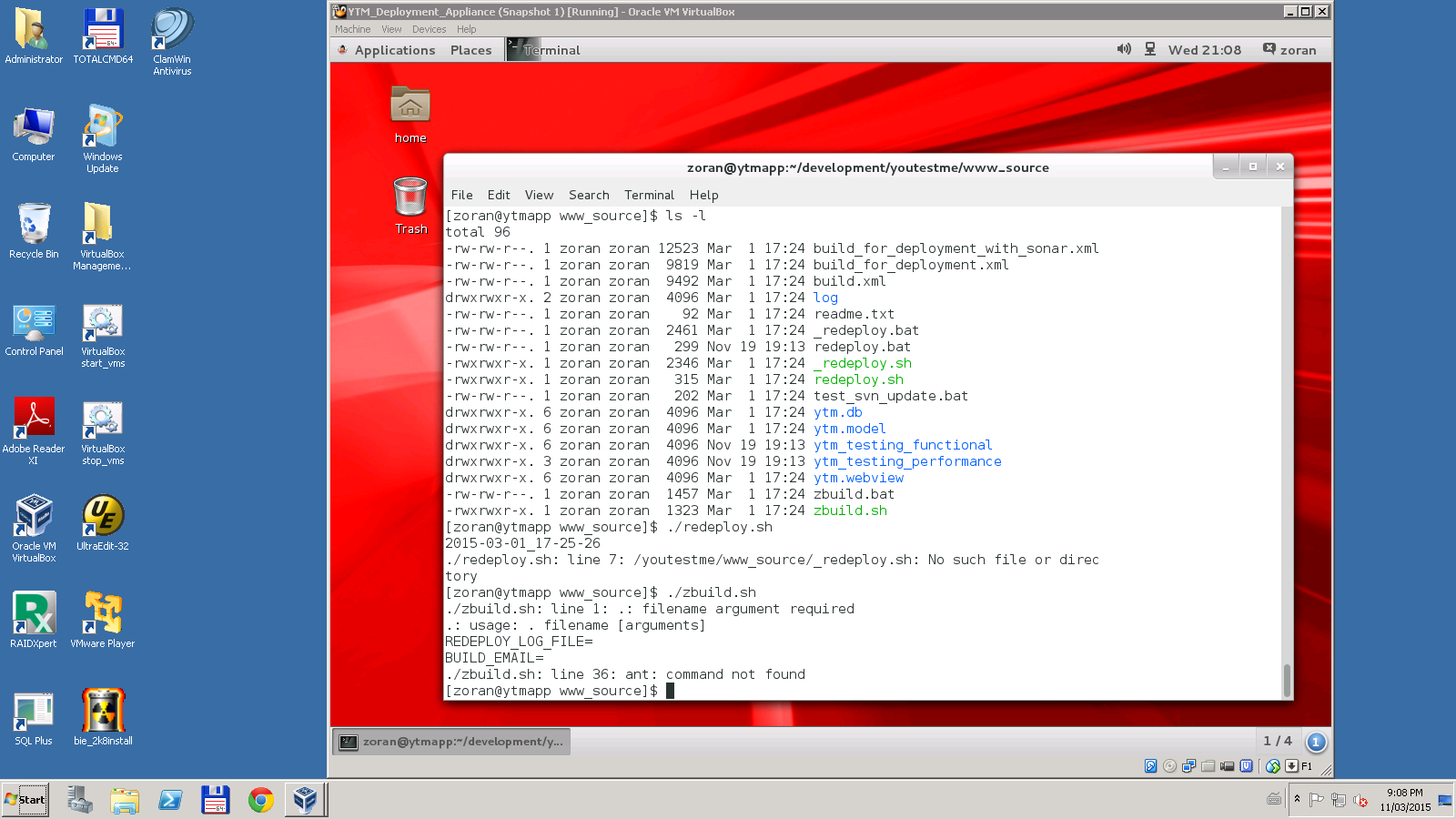
<https://iwando.com/stack/radiant-hosting/>

# Accessing YTM Deployment Appliance

1. Development of the YTM Deployment appliance will be on "zserver"
2. IP address of the Virtual Appliance will be 192.168.1.100
3. "zserver" remote desktop: "home.mallocinc.com:55238"







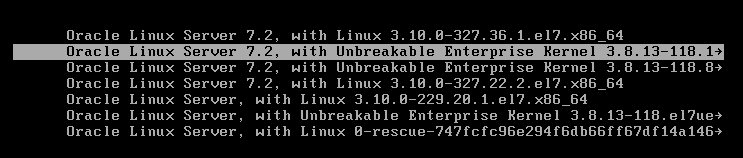
# Initial Configuration

## Change to Static IP Address

Static IP address is 192.168.1.100

# Linux Kernel

FBI VM is running this kernel:



# Multi Tenant Architecture

Software Multitenancy refers to a software architecture in which a single instance of a software runs on a server and serves multiple tenants.

YTM virtual machine is designed to be “multi-tenant”.

## UNIX users

| **#** | **Username** | **Password** | **Description** |
| --- | --- | --- | --- |
|  | root | 1Malloc2 | Use exclusively when needed to run administrative tasks that require “root” privilege otherwise avoid using this user. |
|  | oracle | 1Malloc2 | Use to run “sqlplus” and export and import. |
|  | ytm1 | 2ytm1 |  |
|  | ytm2 | 2ytm1 |  |
|  | ytm3 | 2ytm1 |  |
|  | ytm4 | 2ytm1 |  |
|  | ytm5 | 2ytm1 |  |
|  | ytm6 | 2ytm1 |  |
|  | ytm7 | 2ytm1 |  |
|  | ytm8 | 2ytm1 |  |
|  | ytm9 | 2ytm1 | SVN Branch: youtestme\branches\Mega\_v1.0  Tomcat application port: 9009 (AJP: 9109)  Tomcat config file: \res\ProgramFiles\tomcat\config\deployment\server\_ytm9.xml |
|  | ytm10 | 2ytm1 | SVN Branch: youtestme\branches\Demo\_Mega\_v1.0  Tomcat app port: 9010 (AJP: 9110)  Tomcat config file:  \res\ProgramFiles\tomcat\config\deployment\server\_ytm9.xml |

### Create deployment users

Script to create new user is:

/root/ytm\_scripts/cr\_ytm\_user.sh

Usage example:

1. Log in as “root”
2. Go to directory: /root/ytm\_scripts
3. Execute commend: ./cr\_ytm\_user.sh ytm1

This script will do the following:

1. Remove specified user (if exists) and his home directory. Be careful!
2. Create new user
3. Assign it to the Unix primary group (“oracle”)
4. Set the default password to “2ytm1”
5. Create initial set of standard directories and files using YTM skeleton directory (/etc/ytm\_skel) as a template. All file and directory ownership and permissions are set automatically to recommended values.

It is recommended to use this same script (cr\_ytm\_user.sh) to create your own private account that you may use for development and system maintenance.

#### New User Skeleton Directory

When new user is created then all files from YTM skeleton directory are created in home directory for that user.

Edit YTM skeleton of the new user directory in here:

/etc/ytm\_skel

Note that every directory has:

* Permissions set as they should be in target environment
* Have a “read.me” file which has information about the directory

#### Change user’s UNIXPrimary Group

User has to belong to group “oracle” in order to run SQL\*Plus and other programs within Oracle installation.

Change “ytm”user’s primary group to “oracle” enter:

usermod -g oracle ytm

#### Removing Deployment User

# Global System Variables

Global system variables are set for all users on the system.

Some global system variables like location of the SVN URL are stored in “/etc/bashrc”

#Repo information is the same for all users

export REPO=http://svn.mallocinc.com

export COMMIT\_MSG="Change done by $USER"

Note that this file should be changed if SVN URL is changed.

# Global Aliases

The following aliases should be put in “/etc/bashrc” so it will apply to all users:

set -o vi

#Aliases added by Zoran

alias c="clear"

alias l="ls -l | more"

alias t="ls -lt | more"

alias d="ls -ld \*/ | more"

alias zdu="du -hs"

alias showip="ip addr show"

alias psmy="ps -ef|grep $USER"

alias vb="vi ~/.bashrc"

alias vgb="vi /etc/bashrc"

alias zdu="ls -1|xargs du -sh 2>/dev/null|sort -h -r |more"

alias zdf="df -h"

alias s="sqlplus "

alias istomcat="ps -ef|grep tomcat"

#Repo information is the same for all users

#REPO=http://mallocinc.dnsalias.com:59880/svn

export REPO=http://home.mallocinc.com:59880/svn

export COMMIT\_MSG="Change done by Malloc Inc."

# VirtualBox Guest Additions

Without VirtualBox Guest Additions the seamless mode may not work properly.

1. For installation instructions see e.g. here and here.
2. In VirtualBox click Devices > Insert Guest Additions CD image...
3. Log in as user root, password 1Malloc2.
4. yum install kernel-devel
5. cd /media/VBOXADDITIONS\_...
6. ./VBoxLinuxAdditions.run
7. Reboot.
8. The installation of VirtualBox Guest Additions may have to be repeated after system updates.

# Customizing GDM Log in Screen and Desktop

<https://access.redhat.com/documentation/en-US/Red_Hat_Enterprise_Linux/7/html/Desktop_Migration_and_Administration_Guide/customizing-login-screen.html>

### Disabling the Login Screen User List

You can disable the user list shown on the login screen by setting the org.gnome.login-screen.disable-user-listGSettings key.

When the user list is disabled, users need to type their user name and password at the prompt to log in.

Procedure 10.12.Setting the org.gnome.login-screen.disable-user-list Key

1. Create a gdmdatabase for machine-wide settings in /etc/dconf/db/gdm.d/00-login-screen:

[org/gnome/login-screen]

# Do not show the user list

disable-user-list=true

1. Update the system databases by updating thedconfutility:   
   # dconf update

# Yum

Yum is used to install and update new software and OS.

Setting proxy is required only if local network requires proxy to access the internet. In most case is not required.

Log in as user root, password 1Malloc2.

1. Yum configuration
   1. Add “proxy=http://proxyprd.somecompany.com:8080” to “/etc/yum.conf”
2. type "yum update"

# Installing SVN client

sudo yum install subversion

Detailed instructions:

[http://docs.oracle.com/middleware/1212/core/MAVEN/config\_svn.htm#MAVEN8819](http://docs.oracle.com/middleware/1212/core/MAVEN/config_svn.htm" \l "MAVEN8819)

### Checking out code from SVN

Each user has a script “zco” predefined when user is created:

Content of the script is as follows:

svn co ${REPO}/$1/trunk $1

This means that when you run “zco” and supply the name of the repository that you want to check out (for example: “zco youtestme”) a username that you used to log in to UNIX will be used to log in to SVN.

You can change SVN username by editing script, for example:

svn --username zoran co ${REPO}/$1/trunk $1

## Checking out code from branch – Example

@ECHO OFF

CALL environment

svn checkout %REPO%/youtestme/branches/Demo\_Mega\_v1.0 youtestme

# Configuring Oracle

## Configuring SQL\*Net

SQL\*Net is Oracle native network protocol which is required in order to run SQL\*Plus.

We user SQL\*Plus to run Oracle commands from UNIX shell scripts and Windows batch (\*.bat) scripts.

Some of the useful shell scripts used for YTM:

* Creating database user
* Implementing YTM data model
* Exporting and importing data
* Gather statistics

## Default Database Users

| **#** | **Username** | **Password** | **Role** | **Description** |
| --- | --- | --- | --- | --- |
|  | sys as sysdba | oracle | Administrator | Most powerful user |
|  | system | oracle | Administrator | Administrator |
|  | ytm1 | ytm1 | App1 Id | Application user |
|  | ytmrecover | 2ytm1 | DBA | Used for system recovery if passwords are lost by the client. This password will not be given to the client. |

### Oracle enterprise manager

<https://192.168.1.108:5554/>

### Configuring SQL\*Net using “Net Manager”

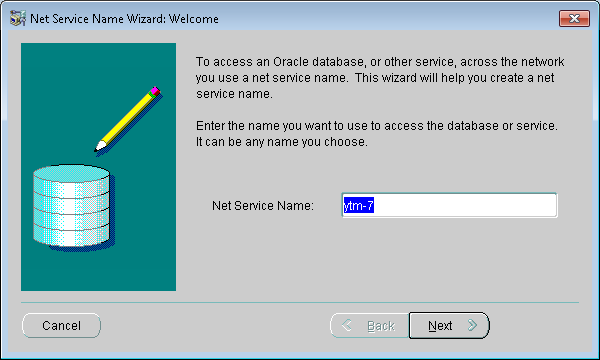
Start “Net Manager”:



Expand “Service Naming” node:

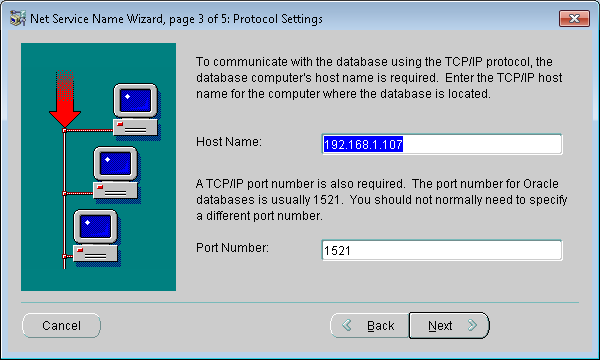


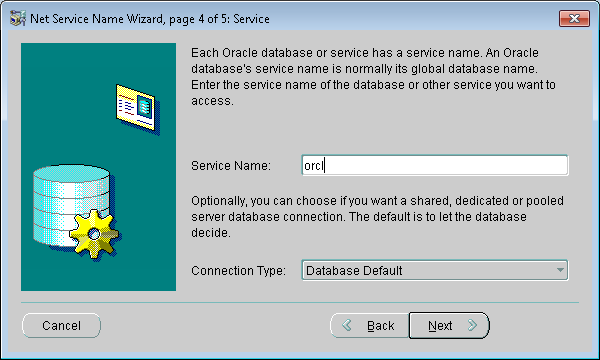
Choose “Service Naming” and then “+” to add new service:

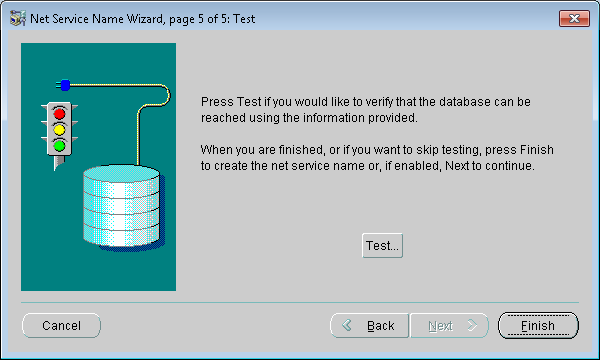


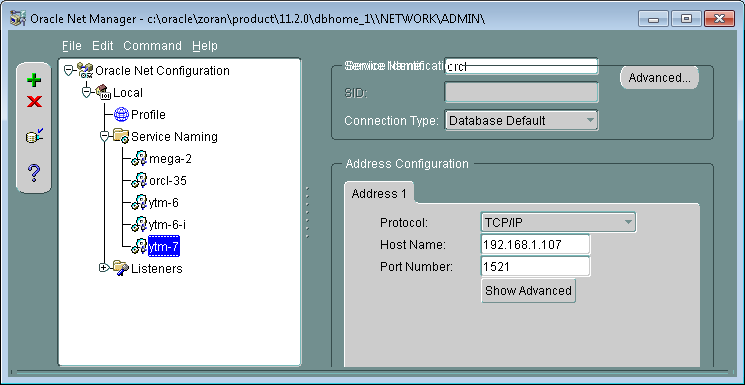
Put the service name of your choice.







****

****

### Oracle Environment Variables

These environment variables are required to run SQL\*Plus on YTM VM:

export ANT\_HOME=/usr/local/apache-ant-1.9.3

export ORACLE\_HOME=/home/oracle/app/oracle/product/12.1.0/dbhome\_1

export ORACLE\_SID=cdb1

export TWO\_TASK=orcl

export XDB\_HOL=Desktop/Database\_Track/XMLDB/

PATH=$PATH:$HOME/bin:$ORACLE\_HOME/bin:$ANT\_HOME/bin

### Database Character Set

At the top of the list of character sets Oracle recommends for all new system deployment is the Unicode character set AL32UTF8.

<http://docs.oracle.com/cd/B19306_01/server.102/b14225/ch2charset.htm>

Character Set can be verified by executing this SQL command:

SELECT value$ FROM sys.props$ WHERE name = 'NLS\_CHARACTERSET';

### Changing SYSTEM and SYS passwords

alter session set container = CDB$ROOT;

alter user system identified by newpassword container=all;

alter user system account unlock;

### Change Password Expiration Period

Search: expire, expiry

Step #1:

Log in to Oracle container database as user “system” or “sys as sysdba”

Step #2:

Find the profile name:

select profile from DBA\_USERS where username = 'SYSTEM';

Step #3:

alter profile DEFAULT limit password\_life\_time UNLIMITED;

### Switching to ARCHIVELOG Mode is not required

Considering usage of YTM system and the fact that the whole system is ion the same media switching to ARCHIVELOG Mode is not required.

Relevant documentation:

[http://docs.oracle.com/database/121/ADMIN/archredo.htm#i1006156](http://docs.oracle.com/database/121/ADMIN/archredo.htm" \l "i1006156)

**Running a Database in NOARCHIVELOG Mode**

NOARCHIVELOG mode protects a database from instance failure but not from media failure. Only the most recent changes made to the database, which are stored in the online redo log groups, are available for instance recovery. If a media failure occurs while the database is in NOARCHIVELOG mode, you can only restore the database to the point of the most recent full database backup. You cannot recover transactions subsequent to that backup.

In NOARCHIVELOG mode you cannot perform online tablespace backups, nor can you use online tablespace backups taken earlier while the database was in ARCHIVELOG mode. To restore a database operating in NOARCHIVELOG mode, you can use only whole database backups taken while the database is closed. Therefore, if you decide to operate a database in NOARCHIVELOG mode, take whole database backups at regular, frequent intervals.

**Running a Database in ARCHIVELOG Mode**

When you run a database in ARCHIVELOG mode, you enable the archiving of the redo log. The database control file indicates that a group of filled redo log files cannot be reused by LGWR until the group is archived. A filled group becomes available for archiving immediately after a redo log switch occurs.

The archiving of filled groups has these advantages:

* A database backup, together with online and archived redo log files, guarantees that you can recover all committed transactions in the event of an operating system or disk failure.
* If you keep an archived log, you can use a backup taken while the database is open and in normal system use.
* You can keep a standby database current with its original database by continuously applying the original archived redo logs to the standby.

### Setting Timezone for Database User

Solution:

Create log on trigger for application database user:

CREATE OR REPLACE TRIGGER ytm\_logon\_trigger

AFTER LOGON

ON DATABASE WHEN (USER = 'YTM49')

BEGIN

EXECUTE IMMEDIATE 'alter session set TIME\_ZONE=''Europe/Belgrade''';

END;

Explanation:

CURRENT\_DATE and CURRENT\_TIMESTAMP return the current date and time in the session time zone.

SYSDATE and SYSTIMESTAMP return the system date and time of the system on which the database resides.

Test it with:

select to\_char(sysdate, 'YYYY-MM-DD HH:MI:SS')

,SESSIONTIMEZONE

,to\_char(current\_date, 'YYYY-MM-DD HH:MI:SS')

,CURRENT\_TIMESTAMP

from dual;

### Export data from other database

Use script "zexp.sh" in:

/home/oracle/exported\_data

* "ZORCL" service is configured to point to database on server .35
* "ORCL" is service on local machine

### Initial data Load

Initial data is required for YTM application to function and it is included in application distribution.

Initial data is placed on location: youtestme/batch\_source/data/initial\_data. Every excel file under folder “System” has corresponding table into database. This data is loading before any other data.

More information’s how to load initial (and all other data) from Eclipse can be fond in: youtestme.doc \Projects\YTM VM Appliances\YTM Deployment Appliance\ YTM Deployment Appliance.docx

The easiest and fastest way to load initial and any other data is using bat script. Bat scrip for loading initial data is: youtestme\batch\_source\scripts\data\_load\ LoadInitialData.bat. Before running this script some adjustments needs to be done. First we needs to set environment variables and this will be done by running that env sciprt: batch\_load\_environment.bat. After that if we open the LoadInitialData.bat script we can see that java program loader has one parameter and that is main properties file. This file is separate for every user so it needs to be changed depends who is using the script. Main properties file whom uses generic user is batch\_source\conf\ytm.properties. Under this file is placed information about database location and paths to other test data.

### Demo Data Load

Demo data includes initial data plus data used to demonstrate YTM application functionalities.

Demo data is placed on location: youtestme/batch\_source/data/demo\_data. On this location in excel files is placed all other relevant data used to demonstrate YTM app basic functionalities besides initial data.

Loading this data is the same the same as loading initial data, the only difference is in bat script. This data loader is using LoadDemoData.bat script. Procedure for running and configuring environment and properties is the same and described under 16.2.10heading.

Default user for presenting YTM app functionalities is demo user, and his username and password is: demo/demo. Also there is a main administrator user: system/system.

### Import Initial data from export file

From remote machine where service name is set up as “ytmdev”:

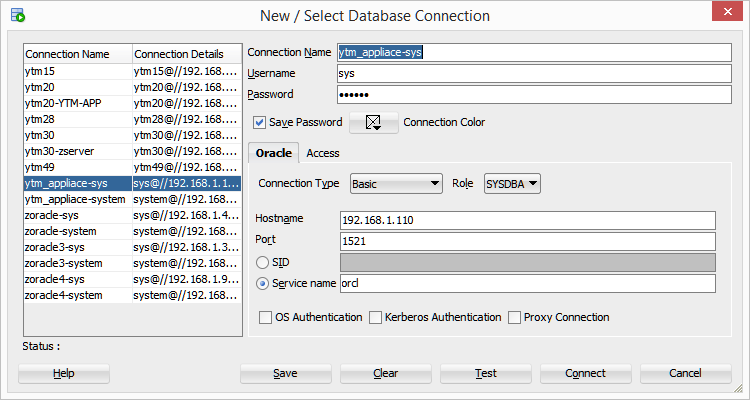
imp ytm1/imp1@ytmdev fromuser=ytm30 touser=ytm1 file=ytm30.dmp

From localhost:

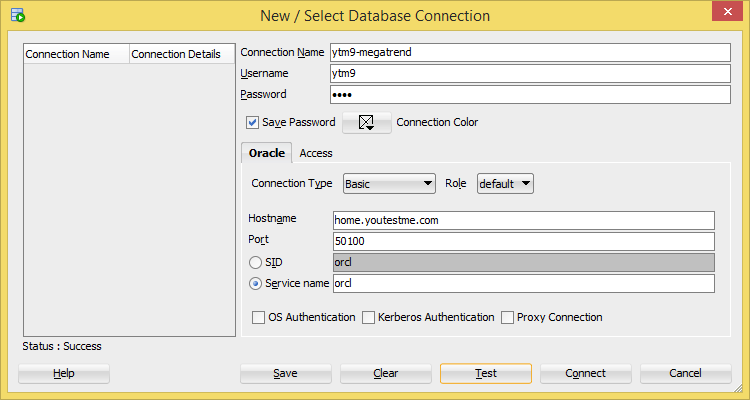
imp ytm1/imp1@orcl fromuser=ytm30 touser=ytm1 file=ytm30.dmp

### Database Connections

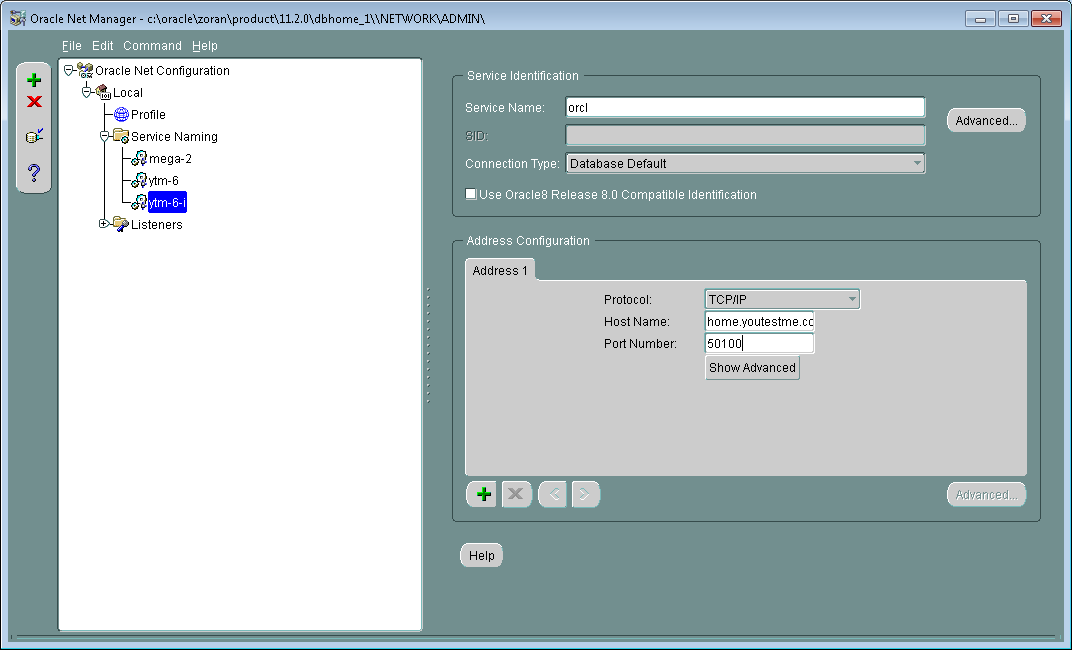
#### Local



#### Database connection over the Internet



#### SQL Net Internet Connection



## Resizing Oracle Data Files

alter tablespace users coalesce;

alter database datafile '/u01/app/oracle/oradata/ORCL/datafile/o1\_mf\_users\_9fxn0t8s\_.dbf' resize 5M;

alter tablespace UNDOTBS1 coalesce;

alter tablespace SYSAUX coalesce;

## Limit Oracle Data file Size

In order to prevent file system getting out of space we should limit size of the data files especially on the files systems that important for system operations such as "/home"

-- Turn off AUTOEXTEND feature

ALTER DATABASE DATAFILE '/home/oracle/app/oracle/oradata/ytmdb/pdytm1/pdytm1\_users01.dbf' AUTOEXTEND OFF;

--Set data file to maximum size (in this case 20 GB)

ALTER DATABASE DATAFILE '/home/oracle/app/oracle/oradata/ytmdb/pdytm1/pdytm1\_users01.dbf' RESIZE 20G;

## Adding new Oracle data file to the tablespace

alter tablespace users add datafile

'/ytmdata/oradata/ytmdatafiles/pdytm1/ytm\_users\_01.dbf' size 100m

AUTOEXTEND ON MAXSIZE UNLIMITED

;

## Removing datafile

alter tablespace users drop datafile '/ytmdata/oradata/ytmdatafiles/pdytm1/ytm\_users\_01.dbf';

### Getting Database Password Store in Protected File

All database passwords will be stored in files readable only to the file owner in this location:

~/env/passwd

Files are names as follows:

db\_dev

db\_prd

db\_uat

Each file has only one line (one word) which is the database password.

This is the sample script how password can be retrieved from the file and stored in environment variable:

#!/bin/bash

USER\_HOME=$(eval echo ~${SUDO\_USER})

echo "user home: " ${USER\_HOME}

db\_password\_file="${USER\_HOME}/env/passwd/db\_dev" #the file where you keep your string name

db\_password=$(cat "$db\_password\_file")

echo "db password: \""$db\_password"\"" #test

## Setting automatic database statistic update

By default it is set to automatic.

BEGIN

DBMS\_AUTO\_TASK\_ADMIN.ENABLE (

client\_name => 'auto optimizer stats collection'

, operation => NULL

, window\_name => NULL

);

END;

To check:

COL CLIENT\_NAME FORMAT a31

SELECT CLIENT\_NAME, STATUS

FROM DBA\_AUTOTASK\_CLIENT

WHERE CLIENT\_NAME = 'auto optimizer stats collection';

auto optimizer stats collection **ENABLED**

## Managing Oracle Memory

### Set memory\_max\_target parameter

Log on to SQL\*PLUS as oracle user "sys as sysdba":

CAREFUL: Make a VM snapshot before doing this - it may make oracle unstartable!

sqlplus sys/2ytm1 as sysdba

alter system set memory\_max\_target = 6144M scope = spfile;

alter system set memory\_target = 5000M scope = spfile;

shutdown

startup

show parameter target

## Limit size of the Oracle dump files

This has to be researched and confirmed that is not causing problem for the system:

Check size of trace files:

cd /home/oracle/app/oracle/diag/rdbms/ytmdb/ytmdb/trace

ls -lSh|more

alter system set max\_dump\_file\_size = '1G';

## Clean old Oracle trace files

Add this to crontab of user "oracle"

#Delete Oracle trace files older than 7 days evry day at 3:00 AM

00 03 \* \* \* find /home/oracle/app/oracle/diag/rdbms/ytmdb/ytmdb/trace -name "\*.trc" -mtime +7 -exec rm {} \; 2>/dev/null

00 03 \* \* \* find /home/oracle/app/oracle/product/12.1.0/dbhome\_1/rdbms/log -name "\*.trc" -mtime +7 -exec rm {} \; 2>/dev/null

# Creating database directory for "Data Pump" Oracle Utility

All data pump files will be created in directory defined in the database.

--Check what directories are defined in the database:

select \* from all\_directories;

--If directory points to the wrong location then drop it:

drop directory YTM\_DATA\_PUMP\_DIR;

--Create directory that points to the right location

create directory YTM\_DATA\_PUMP\_DIR as '/ytmdata/ytm\_data\_pump\_dir';

Note: directory '/ytmdata/ytm\_data\_pump\_dir' has to be owned and writable by the O/S user who runs Oracle database (usually O/S user "oracle")

## Sample data export script using Data Pump

#!/bin/bash

RUN\_TIMESTAMP=$(date +"%Y-%m-%d%-H%M")

echo $RUN\_TIMESTAMP

DB\_LOGIN=system/2ytm1@192.168.1.85:1555/pdytm1

expdp $DB\_LOGIN \

schemas=ytm1,ytm2 \

dumpfile=ytm\_dump\_file\_${RUN\_TIMESTAMP}.dmp \

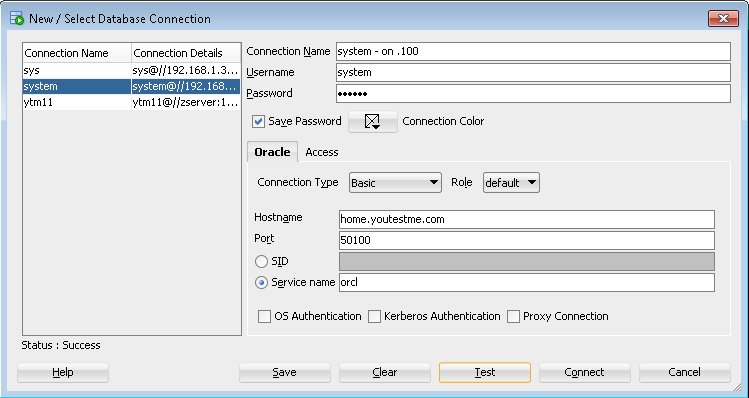
directory=YTM\_DATA\_PUMP\_DIR \

logfile=YTM\_DATA\_PUMP\_DIR:ytm\_dump\_file\_${RUN\_TIMESTAMP}.log

# SQL Developer

### External connection over the Internet

This is temporary convenience method to connect to the database on deployment server while it is still in development. Similar method can be used later assuming that proper security measures are in place.



### Fix SQL\*Developer after System upgrade

After system upgrade Java SDK is sometimes upgraded as well to path to Java Home should be changed in SQL Developer configuration file:

Step #1:

Find new value for Java Home:

find / -type d -name \*openjdk\* -print 2>/dev/null |grep /usr/lib/jvm/java

results:

/usr/lib/jvm/java-1.7.0-openjdk-1.7.0.75-2.5.4.7.0.1.el7\_1.x86\_64

Step #2:

Edit file:

/home/oracle/.sqldeveloper/4.0.0/product.conf

Step #3:

Comment out line with old SetJavaHome and put new line with new path to java (example):

#SetJavaHome /usr/lib/jvm/java-1.7.0-openjdk-1.7.0.71-2.5.3.1.0.1.el7\_0.x86\_64

SetJavaHome /usr/lib/jvm/java-1.7.0-openjdk-1.7.0.75-2.5.4.7.0.1.el7\_1.x86\_64

## Fix SQL\*Developer after System upgrade

As user “oracle” edit:

/home/oracle/.sqldeveloper/4.0.0/product.conf

and put new path to java (example):

SetJavaHome /usr/lib/jvm/java-1.7.0-openjdk-1.7.0.71-2.5.3.1.0.1.el7\_0.x86\_64

## SQL\*Plus

Set up “glogin.sql” and “login.sql”

<http://www.adp-gmbh.ch/ora/sqlplus/login.html>

File: $ORACLE\_HOME/sqlplus/admin/glogin.sql

Common entries:

set pagesize 0

set linesize 190

define \_editor=’vi’

set sqlprompt "&\_user> "

# Usage

|  |  |  |
| --- | --- | --- |
|  | Reboot VM | shutdown –r now |
|  | Release cursor | Right "Ctrl" |
|  |  |  |
|  |  |  |

# Software Components

|  |  |  |
| --- | --- | --- |
| Oracle Linux |  |  |
| Oracle Database |  |  |
| Tomcat |  |  |
|  |  |  |

# Relevant Links

| **Link** | **Description** |
| --- | --- |
| [Oracle Databases](https://shop.oracle.com/pls/ostore/f?p=700:2:0::NO::P2_PRODUCT_TYPE:SWLICENSE) | Pricing |
| [Oracle Database Installation Guide](http://docs.oracle.com/database/121/LADBI/toc.htm) | Installing on Linux |
| [Oracle Virtual Box](https://www.virtualbox.org/) |  |
| [Oracle Pre-Built Developer VMs (for Oracle VM VirtualBox)](http://www.oracle.com/technetwork/community/developer-vm/index.html" \l "ol6) | Oracle Pre-Built Developer VMs for Oracle VM VirtualBox |
| Oracle Linux |  |
| Oracle Database |  |
| [Oracle Linux Comparison](http://www.oracle.com/us/technologies/linux/product/comparisons/index.html) |  |
| [Oracle Partner Silver Level](http://www.oracle.com/partners/en/opn-program/opn-details-by-levels/silver/opn-silver-brief-076212.pdf) |  |
| [Oracle Crystal Ball Classroom Edition](http://www.oracle.com/us/products/applications/crystalball/classroom-edition/overview/index.html) |  |

# YTM Deployment Block Diagram



# Online System Requests

The purpose of online system requests is to automate many system jobs like build, deployment and housekeeping.

The workflow is as follows:

1. User submits system request using front end interface. This is done by inserting record in table SYSTEM\_REQUEST.
2. Unix “cron” job runs every "n" minutes and runs shell script which checks if there is a new request by querying table SYSTEM\_REQUEST.
3. If there is new request, shell script will execute script/program/task associated with that request.
4. When job is completed a STATUS of the record in table SYSTEM\_REQUEST should be updated with SUCCESS or FAILURE.

Package "\youtestme\db\dbmodel\packages\pkg\_system\_requests.sql" should be used to manipulate all related SQL. It is highly desirable to encapsulate all SQL in package for easier invocation from shell, Java or other programs.

Request codes are defined in table CODE WHERE CODE\_TYPE = 'SYSRQ'

New request codes should be defined in spreadsheets used to load initial system data:

\youtestme\batch\_source\data\initial\_data\System\Code\_Type.xls

\youtestme\batch\_source\data\initial\_data\System\Code.xls

First code "SYSRQREDPL" is already created (check it out for the sample how to add new codes).

For the sole purpose of developing Online System Request (OSR), several databases will be created: YTM99 and YTM100. It is strongly advised not to reference these two database instances in your development work.

As an initial attempt to deliver OSR, following artifacts have been created on the YTM\_Deployment\_Appliance:

SCRIPT\_DIR=~/development/youtestme/www\_source/ytm\_deployment\_appliance

| **File Name** | **Description** |
| --- | --- |
| $SCRIPT\_DIR/osr.build.properties | ANT property file used by osr.build.xml |
| $SCRIPT\_DIR/osr.build.xml | ANT build file for Online Service Request |
| $SCRIPT\_DIR/osr.sh | Shell script invoked by the cron job to execute service request |

osr.build.xml, an ANT build file has, at this time, several targets defined that can be executed in order to

build new YTM web application archive – WAR, create a brand new Oracle database schema based on the provided username/password and Oracle database instance.

These are the ant commands that need to be invoked for various targets, once logged in as “ytm” user on the YTM\_Deployment\_Appliance terminal :

Build new YTM web application archive – WAR

*$ cd /home/development/youtestme/www\_source/ytm\_deployment\_appliance*

*$ ant -buildfile osr.build.xml rebuild\_ytm\_webapp*

Create a brand new Oracle database schema

*$ cd /home/development/youtestme/www\_source/ytm\_deployment\_appliance*

*$ ant -buildfile osr.build.xml create\_database -DdbUsername=<...> -DdbPassword=<...>*

For example, if you need to create a brand new Oracle database schema on YTM\_Deployment\_Appliance using username/password “ytm25/ytm25”, you will make following call:

*ant -buildfile osr.build.xml create\_database -DdbUsername= ytm25 -DdbPassword= ytm25*

In the unlikely event of receiving some errors, these are the log files that you can consult:

/home/Development/youtestme/www\_source/ytm\_deployment\_appliance/tmp/create\_database.log

/home/Development/youtestme/db/dbmodel/scripts/tmp/create\_views.log

## Setting up the database for System requests

In the databases where require db objects are not set up you can use this script to create all what is needed in the database for automate system requests:

\Mega\_1.0\youtestme\db\scripts\implement\_sys\_requests.sql

## Setting the crontab

Using crontab you can schedule receptive jobs to be done automatically.

Editing user’s crontab:

crontab -e

The following needs to be in the crontab (note that last two lines in this document are the same line in crontab file):

# MAILTO="system.events@youtestme.com"

#########################################################################################

# WARNING! Scheduled scripts that connect to the database may lock database account

# if password used by the script is not up to date.

# Review all scripts and processes to ensure account will not be locked before

# scheduling any scripts.

#########################################################################################

# Check if there is deployment request in ytm database:

#\*/5 \* \* \* \* ${HOME}/ytm/youtestme/www\_source/build/linux/ytm\_deployment\_request/osr.sh >> ${HOME}/ytm/youtestme/www\_source/build/linux/ytm\_deployment\_request/log/build.request.dep.applnc.log 2>&1

# MAILTO="system.events@youtestme.com"

# Rebuild YTM application every 6 hours

#0 0,6,12,18 \* \* \* ${HOME}/ytm/youtestme/www\_source/build.dep.applnc.sh >> ${HOME}/ytm/logs/cron.builds/build.dep.applnc.log 2>&1

0 0,0,0,23 \* \* \* ${HOME}/ytm/res/Scripts/Unix/util/ytm\_clean\_old\_files.sh >> ${HOME}/ytm/res/Scripts/Unix/util/ytm\_clean\_old\_files.log 2>&1

### Alternative – Manually creating crontab files

Manfully creating and editing user’s crontab file is equivalent to “crontab –e”:

As a root user do the following:

1. cd /var/spool/cron
2. vi ytm6 (or copy existing file: cp ytm8 ytm6)
3. Edit and save file
4. chown ytm6:oracle ytm6 (change file ownership)

## Requesting Automated Build and Deployment – Example

**Step #1:**

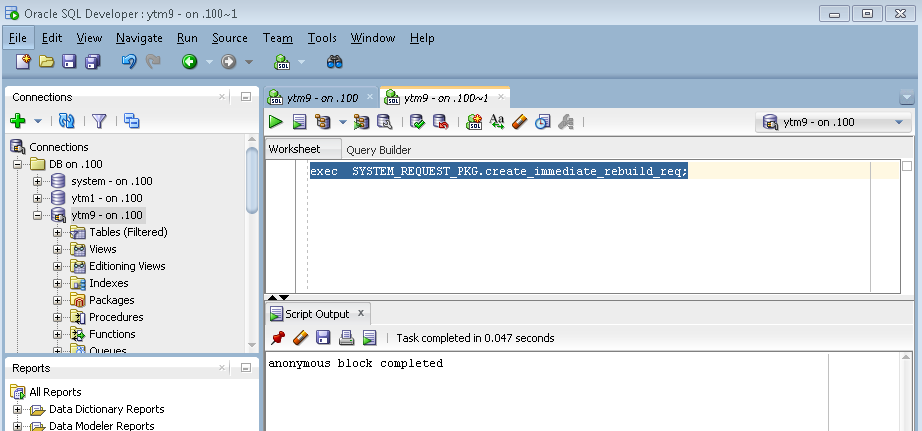
Log in to SQL as a database user for which you would like to rebuild and redeploy YTM application.

**Step #2:**

Execute this SQL statement:

exec SYSTEM\_REQUEST\_PKG.create\_immediate\_rebuild\_req;

Example in SQL Developer:



**#Step 3:**

Check the log on the server:

vi ${HOME}/ytm/youtestme/www\_source/build/linux/ytm\_deployment\_request/log/build.request.dep.applnc.log

or monitor the log:

tail –f ${HOME}/ytm/youtestme/www\_source/build/linux/ytm\_deployment\_request/log/build.request.dep.applnc.log

System requests are being checked every 5 minutes by the script set up in crontab.

Once build is done you should see something like this at the bottom of the log file:

[javac] ^

[javac] Note: Some input files additionally use unchecked or unsafe operations.

[javac] 100 warnings

[echo] Build completed at: 16:35:30:030 EDT

[echo] There are 13 log files in /home/ytm9/ytm/youtestme/www\_source/log folder.

[echo] There are 4 log files in /home/ytm9/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/ytm\_backup folder.

[echo] Build log file: /home/ytm9/ytm/youtestme/www\_source/log/ytm\_build\_29-May-2015-163503.log

[echo] Checking whether Tomcat server is running...

[echo] Starting Tomcat server...

BUILD SUCCESSFUL

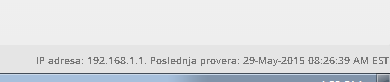
Total time: 28 seconds

Script /home/ytm9/ytm/youtestme/www\_source/ytm\_deployment\_appliance/osr.sh: Finished on 2015-May-29 04:35:32 PM

Script /home/ytm9/ytm/youtestme/www\_source/ytm\_deployment\_appliance/osr.sh: Checking build request on: 2015-May-29 04:40:01 PM

Script /home/ytm9/ytm/youtestme/www\_source/ytm\_deployment\_appliance/osr.sh: There is no request for YTM application rebuild at this time.

Alternatively you can go to application URL and check last deployment time:



# Initial Data Load

## Excel Spreadsheets Templates

\youtestme\excel\_upload\_module\templates\

# YTM Application Users

| **#** | **Username** | **Password** | **Role** | **Description** |
| --- | --- | --- | --- | --- |
|  | system | System1@#ytm | Administrator | Main system administrator |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

# Initial Data Load

\youtestme\batch\_source\data\initial\_data

## File Locations

\youtestme\batch\_source\data

## Load Process

Start java program from location:

\youtestme\batch\_source\src\com\youtestme\loaders\excel

# YTM Application Setup

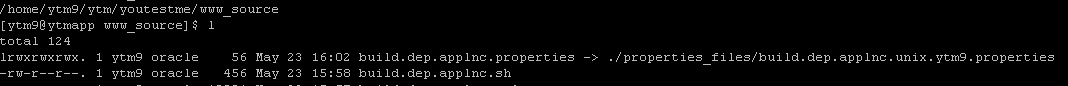
## Create symbolic link to proper configuration files

cd $HOME/ytm/youtestme/www\_source

rm build.dep.applnc.properties

ln -s ./properties\_files/build.dep.applnc.unix.ytm9.properties build.dep.applnc.properties

Outcome:



## Change Application Database Connection Parameters

Locate YTM Application Tomcat configuration file, for example:

\res\ProgramFiles\tomcat\config\deployment\server\_ytm1.xml

Change database connection parameters in this section:

<Context docBase="ytm" path="/" reloadable="true">

               <Resource

                 name="jdbc/UCPPool"

                  auth="Container"

                  factory="oracle.ucp.jdbc.PoolDataSourceImpl"

                  type="oracle.ucp.jdbc.PoolDataSource"

                  description="UCP Connection Pool in Tomcat"

                  connectionFactoryClassName="oracle.jdbc.pool.OracleDataSource"

                  minPoolSize="3"

                  maxPoolSize="15"

                  inactiveConnectionTimeout="60"

                  user="ytm1"

                  password="ytm1"

                  url="jdbc:oracle:thin:@(DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)

                       (HOST=127.0.0.1)(PORT=1521))(CONNECT\_DATA=(SERVICE\_NAME=orcl)))"

                  connectionPoolName="UCPPool"

                  validateConnectionOnBorrow="true"

               sqlForValidateConnection="select 1 from DUAL" />

</Context>

# Building and deploying YTM application

Log in to UNIX as application user (i.e. “ytm3”)

cd $HOME/ytm/youtestme/www\_source

build.dep.applnc.sh + ENTER

Log file is created in:

$HOME/ytm/youtestme/www\_source/log/build.request.dep.applnc.log

# Common Tomcat Tasks

## Starting Tomcat and YTM Application

Example for OS user “ytm6”:

cd /home/ytm6/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/bin

startup.sh -config /home/ytm6/ytm/res/ProgramFiles/tomcat/config/deployment/server\_ytm6.xml

Same as above but more generic commands - without username being hardcoded:

cd /home/${USER}/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/bin

startup.sh -config /home/${USER}/ytm/res/ProgramFiles/tomcat/config/deployment/server**\_${USER}**.xml

### As user "root"

su ytm1 -c "/home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/bin/startup.sh -config /home/ytm1/ytm/res/ProgramFiles/tomcat/config/deployment/server\_ytm1.xml"

su ytm2 -c "/home/ytm2/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/bin/startup.sh -config /home/ytm2/ytm/res/ProgramFiles/tomcat/config/deployment/server\_ytm2.xml"

### Starting Tomcat using "init.d" settings

**cd /etc/rc.d/init.d**

**./tomcat\_ytm1 start**

**Output:**

Waiting for Oracle to start...:

SQL\*Plus: Release 12.1.0.2.0 Production on Thu Jan 12 16:22:35 2017

Copyright (c) 1982, 2014, Oracle. All rights reserved.

Connected.

1

Disconnected from Oracle Database 12c Standard Edition Release 12.1.0.2.0 - 64bit Production

Purging ytm1 Tomcat temp directories: Starting ytm1 Tomcat: YTM\_COMMAND=/home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/bin/startup.sh -config /home/ytm1/ytm/res/ProgramFiles/tomcat/config/deployment/server\_ytm1.xmlUsing CATALINA\_BASE: /home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit

Using CATALINA\_HOME: /home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit

Using CATALINA\_TMPDIR: /home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/temp

Using JRE\_HOME: /

Using CLASSPATH: /home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/bin/bootstrap.jar:/home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/bin/tomcat-juli.jar

echo -n "Purging ${YTM\_USER} Tomcat logs: "

su ${YTM\_USER} -c "rm -f /home/${YTM\_USER}/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/logs/\*"

## Troubleshooting Linux and Oracle start-up

### Important Log Files

Linux start-up log:

/var/log/messages

Oracle start-up logs:

/home/oracle/app/oracle/product/12.1.0/dbhome\_1/startup.log

/home/oracle/app/oracle/diag/rdbms/ytmdb/ytmdb/trace/alert\_ytmdb.log

## Stopping Tomcat

Example for OS user “ytm6”:

cd /home/ytm6/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/bin

shutdown.sh -config /home/ytm6/ytm/res/ProgramFiles/tomcat/config/deployment/server\_ytm6.xml

Same as above but more generic commands - without username being hardcoded:

cd /home/${USER}/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/bin

shutdown.sh -config /home/${USER}/ytm/res/ProgramFiles/tomcat/config/deployment/server\_${USER}.xml

### As user "root"

su ytm1 -c "/home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/bin/shutdown.sh -config /home/ytm1/ytm/res/ProgramFiles/tomcat/config/deployment/server\_ytm1.xml"

su ytm2 -c "/home/ytm2/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/bin/shutdown.sh -config /home/ytm2/ytm/res/ProgramFiles/tomcat/config/deployment/server\_ytm2.xml"

### Stopping Tomcat using "init.d" settings

As user "root:

**cd /etc/rc.d/init.d**

**./tomcat\_ytm1 stop**

Output:

Stopping ytm1 Tomcat: Using CATALINA\_BASE: /home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit

Using CATALINA\_HOME: /home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit

Using CATALINA\_TMPDIR: /home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/temp

Using JRE\_HOME: /

Using CLASSPATH: /home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/bin/bootstrap.jar:/home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/bin/tomcat-juli.jar

### Tomcat Upgrade

Tomcat is located in the resources repository on this link:

<https://svn.youtestme.com/scm/svn/res/trunk/ProgramFiles/tomcat>

All versions used (and active) are located in this directory

#### Bean Manager Issue

1. Go to the apache home folder in res
2. Edit file conf/context.xml and add this lines in Context element

<Resource name="BeanManager" auth="Container"

type="javax.enterprise.inject.spi.BeanManager”

factory="org.jboss.weld.resources.ManagerObjectFactory" />

#### Configure “server.xml” and “context.xml File

1. Go to the apache home folder in res
2. Edit file conf/server.xml
3. Enable AJP connector

<Connector protocol="AJP/1.3"

secretRequired="false"

address="0.0.0.0"

port="9101"

redirectPort="8443" />

Port is usually configured with last number of tomcat user (e.g. ytmN >>910N)

1. Edit file conf/context.xml
2. Add line

<Manager pathname=*""*/>

This line keeps tomcat from session restoration

#### Configure Tomcat Manager

1. Edit/Create tomcat user file conf/tomcat-user.xml
2. Add/uncomment tomcat user element

<tomcat-users>

<role rolename="admin-gui"/>

<role rolename="manager-gui"/>

<role rolename="tomcat"/>

<role rolename="manager-script"/>

<user username="ytmadmin" password="**SECRET**" roles="admin-gui,manager-gui,tomcat,manager-script"/>

</tomcat-users>

1. Set strong password for tomcat manager user and share it on passbolt

#### Tomcat Announcment

Tomcat is regularly sending emails announcing new versions and sending changelogs. To get on the list for these announcements, send a blank email to the address:

[announce-subscribe@tomcat.apache.org](mailto:announce-subscribe@tomcat.apache.org)

More information can be found on [this page](https://tomcat.apache.org/lists.html" \l "tomcat-announce).

## Manually deploy war file

Example for OS user “ytm6”:

1. Stop Tomcat
2. cp ytm.war /home/ytm6/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/ytmapp
3. Start Tomcat

## Checking Tomcat Log File

vi /home/ytm6/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/logs/catalina.out

or

tail –f /home/ytm6/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/logs/catalina.out

## Accessing YTM Application

Each “ytm” user can run one instance of YTM application.

YTM application can be accessed on the local network on the following URL (example for user “ytm6”):

<http://192.168.1.102:9006>

Up to 10 instances of YTM application can be run on one VM. Generally number of instances is limited only by available resources (disk and memory) and in our case we purposefully limited it to ten (ytm1-ytm10).

Ports are assigned per O/S user are shown in table below:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **#** | **O/S User** | **HTTP port** | **AJP port** | **Description** |
|  | ytm1 | 9001 | 9101 | Official site |
|  | ytm2 | 9002 | 9102 |  |
|  | ytm3 | 9003 | 9103 |  |
|  | ytm4 | 9004 | 9101 |  |
|  | ytm5 | 9005 | 9102 |  |
|  | ytm6 | 9006 | 9103 | Standby site |
|  | ytm7 | 9007 | 9103 | Experimental site |
|  | ytm8 | 9008 | 9101 |  |
|  | ytm9 | 9009 | 9102 | Official test site |
|  | ytm10 | 9010 | 9103 |  |

# Starting Application at boot

/etc/rc.d/init.d/tomcat

Log file: /var/log/messages

cd /etc/rc.d/rc4.d

cd /etc/rc.d/init.d

Create file "ytm6"

#!/bin/sh

#

su oracle -c "$ORACLE\_HOME/bin/dbstart $ORACLE\_HOME"

su oracle -c "$ORACLE\_HOME/bin/lsnrctl start"

su oracle -c "$ORACLE\_HOME/bin/dbstart $ORACLE\_HOME"

su oracle -c "/home/oracle/ords.sh start"

su ytm6 –c “/home/ytm6/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/bin/shutdown.sh -config /home/ytm6/ytm/res/ProgramFiles/tomcat/config/deployment/server\_ytm6.xml”

## Removing start application and Oracle from Linux boot

chkconfig --list

chkconfig --del dbora

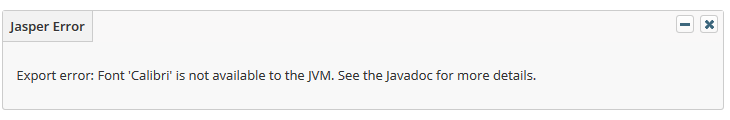
chkconfig --del oracle

chkconfig --del tomcat\_ytm2

chkconfig --list

# Installing required fonts

If you experience the following problem while exporting a quiz, you probably have to install certain required fonts into your OS.



## Link to the original documentation

http://help.accusoft.com/PCC/v8.1/HTML/How%20to%20Install%20Microsoft%20Fonts%20on%20Linux.html

## Executing fontInstall.sh script

To install fonts, execute this script.

Script path:

https://svn.youtestme.com/scm/svn/res/trunk/Scripts/Unix/ytm/config\_scripts/fontsInstall.sh

## Testing the installation of fonts

Go to:

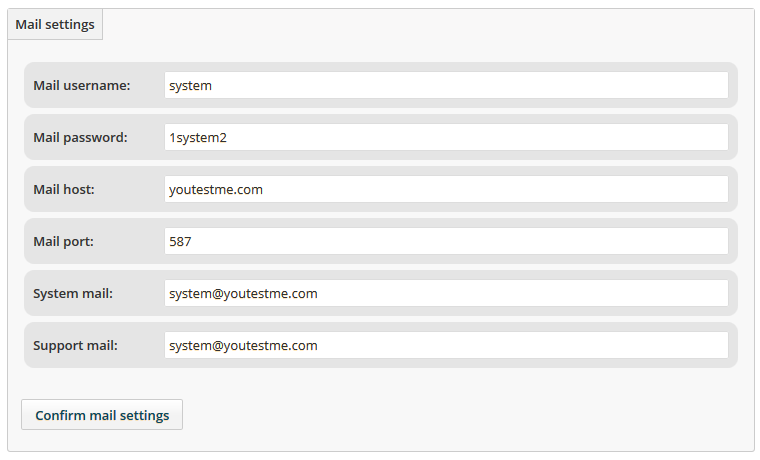
<http://home.youtestme.com:55246/ytmdemo1/pages/quizzes.xhtml>

and try to export a quiz.

# Controlling application settings from the admin dashboard

Users with the administrator role have the privilege to go to the Settings page and execute system commands. Any changes will be applied immediately.

## Email settings



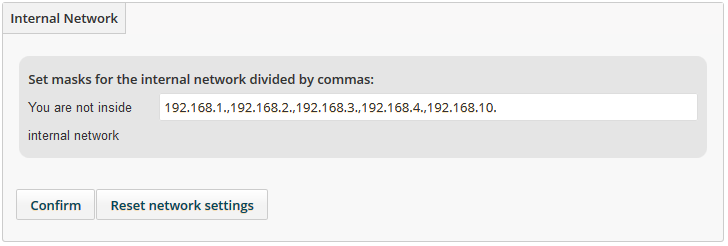
## Rebuilding the system

Call a system procedure. The default one rebuilds the system from within the application. New patches will be pulled from the web. Application will be unreachable for a few minutes.



## Setting the internal network

If you need to restrict the quiz access to the internal network, you can set internal network masks, divided by a comma,here. Any changes will be appliedimmediately.



# Running Common Commands on all YTM Applications

It is possible to run common commands on all YTM applications at once, for example by executing one command you can do the following:

|  |  |  |
| --- | --- | --- |
| **#** | **Command** | **Description** |
|  | start\_10\_tomcats.sh | Start all 10 Tomcat servers |
|  | stop\_10\_tomcats.sh | Stop all 10 Tomcat servers |
|  | update\_10\_svns.sh | Update all 10 YTM Application code from svn |
|  | create\_10\_symlinks.sh | Create all required symbolic links for all YTM Application |

Command are located in “/root/ytm/unix/ytm/10\_commandments” and need to be executed as user “root”, for example:

cd /root/ytm/unix/ytm/10\_commandments

./start\_10\_tomcats.sh

Note that current directory in UNIX is not automatically in the PATH so commands need to be preceded with “./”

# Running Common Commands on some of YTM Applications

It is possible to limit number of “active” YTM applications and to run common commands only on that limited list, for example by executing one command you can do the following:

|  |  |  |
| --- | --- | --- |
| **#** | **Command** | **Description** |
|  | start\_tomcats.sh | Start all 10 Tomcat servers |
|  | stop\_tomcats.sh | Stop all 10 Tomcat servers |
|  | update\_svns.sh | Update all 10 YTM Application code from svn |
|  | create\_symlinks.sh | Create all required symbolic links for all YTM Application |

Command are located in “/root/ytm/unix/ytm/user\_comandments” and need to be executed as user “root”, for example:

cd /root/ytm/unix/ytm/user\_comandments

./start\_tomcats.sh

Note that current directory in UNIX is not automatically in the PATH so commands need to be preceded with “./”

List of applications for which commands should be executed are maintained in this file:

/root/ytm/unix/ytm/user\_comandments/ytm\_list.txt

And it looks something like this:

ytm2

ytm4

ytm7

In this case this would mean that when we execute for example command “start\_tomcats.sh” only tomcats for users: ytm2, ytm4 and ytm7 will be started.

# Create YTM Application – Quick Start

This example will explain creating YTM application from scratch. To illustrate process we will use application id “ytm3”.

## Step #1 – Create user ytm3

1. Make sure that nobody is connected as user “ytm3”
2. Log in as “root”
3. Go to directory “/root/ytm/unix/ytm”
4. Execute command: “./cr\_ytm\_user.sh ytm3”

**Example:**

[root@ytm-6 ytm]# ./cr\_ytm\_user.sh ytm3

Creating new user: ytm3...

+ userdel -r ytm3

userdel: user ytm3 is currently used by process 6004

+ OUT=8

+ '[' 8 -eq 0 ']'

+ echo 'User could not be deleted!'

User could not be deleted!

[root@ytm-6 ytm]#

You can see that user could not be deleted because it has running processes. That running process is usually Tomcat application so to solve the problem you need to stop it:

1. Log in as “ytm3” (as root you can do it with command “su – ytm3”)
2. Execute command “tstop”
3. Type “exit” to return to root shell
4. Execute command: “./cr\_ytm\_user.sh ytm3”

Now user ytm3 is created properly:

[root@ytm-6 ytm]# ./cr\_ytm\_user.sh ytm3

Creating new user: ytm3...

+ userdel -r ytm3

+ OUT=0

+ '[' 0 -eq 0 ']'

+ useradd -c 'Deployment user ytm3' -m -d /home/ytm3 -g oracle -k /etc/ytm\_skel ytm3

+ echo ytm3:2ytm1

+ chpasswd

+ echo 'Done!'

Done!

[root@ytm-6 ytm]#

Default password for any user created this way is “2ytm1”.

## Step #2 – get the code from SVN

1. Log in as user ytm3
2. Go to directory “/home/ytm3/ytm”
3. Edit file “zco” if you want:
   1. code other then code from trunk to be checked out
   2. to use user other than standard SVN read only “ytm” user
4. Execute “zco”. Default password for “svn” is “2ytm1”

## Step #3 – Build YTM Application

1. Go to directory “/home/ytm3/ytm/youtestme/www\_source”
2. Check if symbolic link exists:   
   If it does not exist, execute command: “create\_prop\_file\_symbolic\_link.sh”
3. Execute this command to build YTM application: “build.dep.applnc.sh”. This command will do the following:
   1. Stop tomcat (if it is running)
   2. Update code from SVN
   3. Build and deploy YTM application
   4. Start Tomcat

Now you can access YTM application on port 9003.

# Directory Structures

## User “root”

Directory “/root”

|  |  |
| --- | --- |
| -- ytm |  |
| `-- unix |  |
| |-- util |  |
| | `-- functions |  |
| `-- ytm |  |
| |-- 10\_commandments |  |
| |-- user\_comandments |  |
| `-- user\_skeleton |  |
| `-- ytm\_skel |  |
| |-- env |  |
| | `-- passwd |  |
| |-- tmp |  |
| `-- ytm |  |

Directories with files:

|  |  |
| --- | --- |
| **File** | **Description** |
| -- ytm/ |  |
| |-- unix/ |  |
| | |-- util/ |  |
| | | |-- backup\_all.sh |  |
| | | |-- compile\_schema.sh |  |
| | | |-- copy\_files.sh |  |
| | | |-- create\_all\_tables\_descriptor.sh |  |
| | | |-- dircomp.sh |  |
| | | |-- DROP\_ALL\_OBJECTS\_2.SQL |  |
| | | |-- ffile |  |
| | | |-- find\_class |  |
| | | |-- functions/ |  |
| | | | `-- techo |  |
| | | |-- rcr.sh |  |
| | | |-- rebuild\_indexes.sql |  |
| | | |-- recompile\_views.sh |  |
| | | |-- recompile\_views.sql |  |
| | | |-- remove\_cr.sh |  |
| | | |-- tar\_all.sh |  |
| | | |-- tar\_backup |  |
| | | |-- tar\_restore |  |
| | | |-- update\_statistics\_for\_all.sh |  |
| | | |-- update\_statistics.sh |  |
| | | |-- update\_table\_statistics.sql |  |
| | | |-- zfind+ |  |
| | | |-- zfind++ |  |
| | | |-- zfind\_advanced++ |  |
| | | |-- zfindgrep.sh |  |
| | | |-- zfind.sh |  |
| | | |-- zgrep |  |
| | | `-- zistext |  |
| | `-- ytm/ |  |
| | |-- 10\_commandments/ |  |
| | | |-- create\_10\_symlinks.sh\* |  |
| | | |-- start\_10\_tomcats.sh\* |  |
| | | |-- stop\_10\_tomcats.sh\* |  |
| | | `-- update\_10\_svns.sh\* |  |
| | |-- crontab.txt |  |
| | |-- cr\_ytm\_user.sh\* |  |
| | |-- fontsInstall.sh\* |  |
| | |-- user\_comandments/ |  |
| | | |-- create\_symlinks.sh\* |  |
| | | |-- READ.ME |  |
| | | |-- start\_tomcats.sh\* |  |
| | | |-- stop\_tomcats.sh\* |  |
| | | |-- update\_svns.sh\* |  |
| | | `-- ytm\_list.txt |  |
| | `-- user\_skeleton/ |  |
| | `-- ytm\_skel/ |  |
| | |-- env/ |  |
| | | |-- passwd/ |  |
| | | | |-- db\_dev |  |
| | | | |-- db\_prd |  |
| | | | |-- db\_uat |  |
| | | | `-- read.me |  |
| | | `-- read.me |  |
| | |-- tmp/ |  |
| | `-- ytm/ |  |
| | |-- read.me |  |
| | |-- zco\* |  |
| | `-- zup\* |  |
| |-- zco\* |  |
| `-- zup\* |  |

## User “ytm\*”

All ytm users have the same directory structure and to illustrate it we will use user “ytm1”.

Directory “/home/ytm1”

|  |  |
| --- | --- |
| |-- env |  |
| | `-- passwd |  |
| |-- tmp |  |
| `-- ytm |  |
| |-- res |  |
| | |-- Database\ Models\ and\ Scripts |  |
| | |-- DBA\ Graphics |  |
| | |-- Eclipse\ Config |  |
| | |-- Environment |  |
| | |-- Fileupload |  |
| | |-- MS\ Word\ Config |  |
| | |-- ProgramFiles |  |
| | |-- Scripts |  |
| | `-- SVNClient |  |
| `-- youtestme |  |
| |-- admin |  |
| |-- batch\_source |  |
| |-- cfg |  |
| |-- db |  |
| |-- doc |  |
| |-- excel\_upload\_module |  |
| |-- scripts |  |
| |-- test\_data-deleteme |  |
| |-- test\_project |  |
| |-- www\_source |  |
| |-- ytm\_testing\_functional |  |
| `-- ytm\_testing\_performance |  |

# Relevant Links

| **Link** | **Description** |
| --- | --- |
| [Oracle Databases](https://shop.oracle.com/pls/ostore/f?p=700:2:0::NO::P2_PRODUCT_TYPE:SWLICENSE) | Pricing |
| [Oracle Database Installation Guide](http://docs.oracle.com/database/121/LADBI/toc.htm) | Installing on Linux |
| [Oracle Virtual Box](https://www.virtualbox.org/) |  |
| [Oracle Pre-Built Developer VMs (for Oracle VM VirtualBox)](http://www.oracle.com/technetwork/community/developer-vm/index.html" \l "ol6) | Oracle Pre-Built Developer VMs for Oracle VM VirtualBox |
| Oracle Linux |  |
| Oracle Database |  |
| [Oracle Linux Comparison](http://www.oracle.com/us/technologies/linux/product/comparisons/index.html) |  |
| [Oracle Partner Silver Level](http://www.oracle.com/partners/en/opn-program/opn-details-by-levels/silver/opn-silver-brief-076212.pdf) |  |
| [Oracle Crystal Ball Classroom Edition](http://www.oracle.com/us/products/applications/crystalball/classroom-edition/overview/index.html) |  |

# Send Email From Linix Command Line

The following procedure will explain how to send email from the terminal, using “mailx” Mail Transfer Agent - MTA and Gmail as SMTP server.

## Configuration

1. Create a certificate directory and key databases (all commands should be executed as ***root*** user):

$ mkdir ~/.certs

$ certutil -N -d ~/.certs

1. Fetch the certificate from Gmail and import the cert file into the new database:

$ echo -n | openssl s\_client -connect smtp.gmail.com:465 | sed -ne '/-BEGIN CERTIFICATE-/,/-END CERTIFICATE-/p' > ~/.certs/gmail.crt

$ certutil -A -n "Google Internet Authority" -t "C,," -d ~/.certs -i ~/.certs/gmail.crt

1. Add the account settings in “/etc/mail.rc” (insert at the end of the file):

account gmail {

set smtp-use-starttls

set ssl-verify=ignore

set smtp-auth=login

set smtp=smtp://smtp.gmail.com:587

set from="example@gmail.com(*sender\_name*)"

set smtp-auth-user=example@gmail.com

set smtp-auth-password=*password*

set ssl-verify=ignore

set nss-config-dir=/root/.certs

}

Additional Explanations:

*example@gmail.com* - any Gmail address with “Less secure app access” option turned on

*sender\_name* - arbitrary name, your name and surname, for example

*password* - password for Gmail account **example@gmail.com**

1. Test email sending with the following command:

$ echo -e "Mail body text" | mailx -v -A gmail -s "Mail subject" recipient@some.com

You can use arguments “-b” for **BCC** and “-c” for **CC** to send email to multiple recipients:

$ echo -e "Mail body text" | mailx -v -A gmail -s "Mail subject" -b bcc\_user@some.com -c cc\_user@some.com recipient@some.com

Instead of “echo” command, you can use “cat” and send the message written in the file *message.msg*:

$ cat message.msg | mailx -v -A gmail -s "Mail subject" -b bcc\_user@some.com -c cc\_user@some.com recipient@some.com

## Useful tip

To allow all users to send email from the terminal, put the “mailx” command in the bash script “/var/local/send\_mail.sh”, for example, and add the following line at the end of “/etc/sudoers” file (use “visudo” command as ***root*** to open the file):

*ALL ALL=(ALL) NOPASSWD: /var/local/send\_mail.sh*

Test email sending from the terminal as “*ytm*” application user by executing the following command:

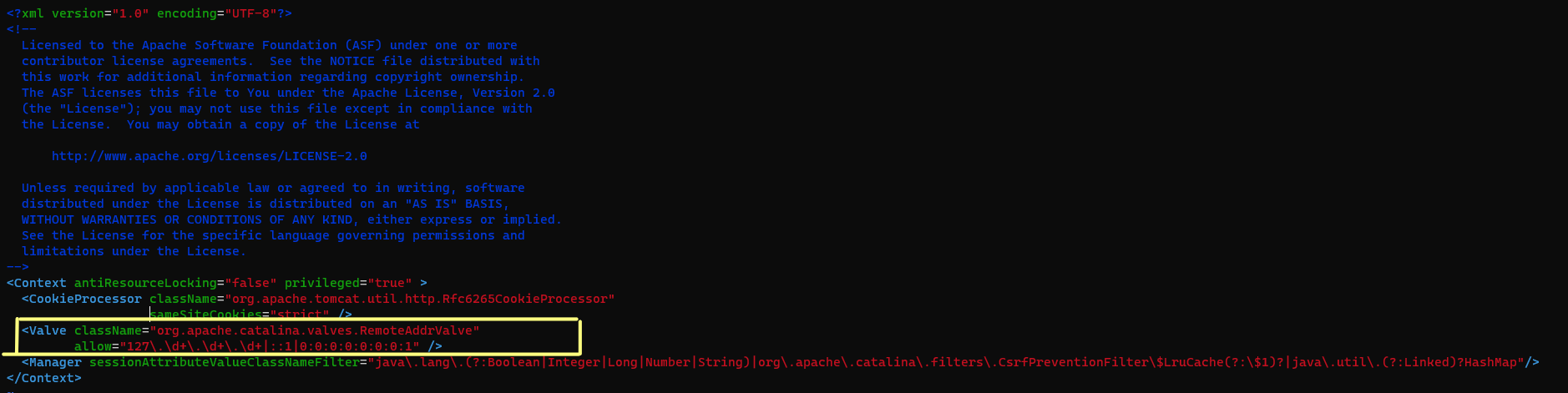
$ sudo /var/local/send\_mail.sh

# Troubleshooting

## Restarting Tomcat manager

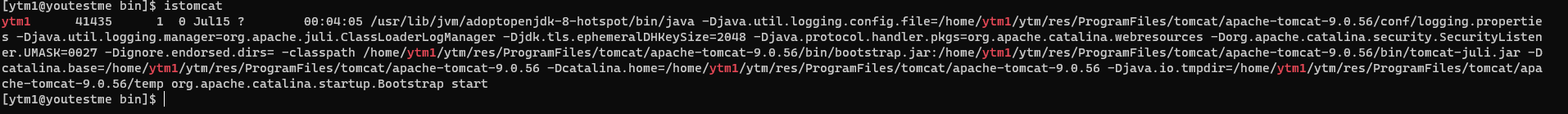
Sometimes it happen for tomcat manager to stop working one of the most common reason is spikes of ram usage and when that happens restarting tomcat is necessary

1. Login into the server where tomcat stoped working
2. Check if the tomcat is running with : istomcat
3. If you see that tomcat process is running use the command tstop to stop the tomcat
4. Sometimes the command in step 3 won’t stop the tomcat service fallow the steps from [Tomcat could not be stopped](#_Tomcat could not be stopped)
5. When the tomcat is stoped navigate to webapps directory the best way to do that is: cd $TOMCAT\_DIR/webapps and copy only the files with extension **.war**
6. Best practice is to create directory in your home directory named **wars**
7. After the directory is created navigate back to webapps directory and use the fallowing command to copy all **.war NOTE :** I suggest to use mv command instead of cp because it faster and it wont leave any junk behind  
   mv \*.war /home/ytm1/wars/
8. Check if the mv command moved the .war files into the /wars/ directory. ls -la /home/ytm1/wars/ all the .war files that were in the cd $TOMCAT\_DIR/webapps now will be available there
9. Next remove everything from webapps/ directory with: rm -rf \*
10. Now use the svn up command to update the webapps/ directory
11. Next navigate to manager/META-INF and open the context.xml file remove the selected text from the file and close and save the file



1. Now go back to $TOMCAT\_DIR/bin and use the script **startup.sh**
2. When the scrip is done check if the tomcat is running iscomat

Sample output



1. Next go to wars/ directory and start moving the .war files back into cd $TOMCAT\_DIR/webapps directory

mv gc10324r##10.3.24r.war /home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-9.0.56/webapps/

1. Change the gc10324r##10.3.24r.war with the context of the .war file you are moving. **NOTE**: you can move 2-3 .war file at once

## Checking Tomcat Log

In most cases there will be a problem with YTM application. There are two aliases set up to make checking of Tomcat log easier and faster:

1. tlog
2. tlogt

Aliases are defined as:

alias tlog='vi /home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/logs/catalina.out'

alias tlogt='tail -f /home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/logs/catalina.out'

## Tomcat could not be stopped

Use command “istomcat” to see if tomcat is running.

Sample output:

ytm1 **2322** 1 0 Jun09 ? 00:18:49 java -Djava.util.logging.config.file=/home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/conf/logging.properties -Djava.util.logging.manager=org.apache.juli.ClassLoaderLogManager -Djava.endorsed.dirs=/home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/endorsed -classpath /home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/bin/bootstrap.jar:/home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/bin/tomcat-juli.jar -Dcatalina.base=/home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit -Dcatalina.home=/home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit -Djava.io.tmpdir=/home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/temp org.apache.catalina.startup.Bootstrap -config /home/ytm1/ytm/res/ProgramFiles/tomcat/config/deployment/server\_ytm1.xml start

Use command “tstop” to stop the Tomcat server.

After issueing “tstop”, chack if tomcat is still running. If it is still running after several minuted the use “kill” command to kill the process.

For example:

Use "kill -9 2322"

Note that “2322” is a Unix process id that could be seen in output od the command “istomcat”.

## catalina.out log is to big

The catalina.out log messages and log files communicate events and conditions that affect Tomcat server’s operations

1. To clean the catalina.out log you need to be log in with ytm1 user important note, tomcat doesn’t need to be shutdown for this to work
2. Navigate to the location of catalina.out log file $TOMCAT\_DIR/logs and enter the fallowing command

truncate -s 0 M catalina.out

## Automated build does not work

Use "crontab -e"

## Oracle account is locked

To unlock user “ytm1” log in to Oracle database as “system” or “sys as sysdba” and execute command:

ALTER USER ytm1 ACCOUNT UNLOCK;

## Dropping public synonyms from the database

There should not be any public synonyms in the database. If there are any it is leftover from obsolete db implementation.

Generate drop statements with this SQL:

SELECT 'DROP PUBLIC SYNONYM ' || SYNONYM\_NAME || ';' FROM ALL\_SYNONYMS WHERE TABLE\_OWNER LIKE 'YTM%';

Execute generated SQL statements to drop synonyms.

## VM Clipboard does not work

When “copy-paste” between host and VM don’t work go to VM command line and execute:

/usr/bin/VBoxClient –clipboard

## Troubleshooting procedures

1.       check minimal required system resources (RAM, Disk, CPU)

command “free -m -h”

command “cat /proc/meminfo”

2.       check free disk space on all file systems

use command “df -h”

## Create new database

Important:

Shutdown tomcat

From windows cmd call script with parameters:

youtestme\trunk\db\dbmodel\scripts\create\_database\_wrapper\_script ytm ytm3 ytm3

These parameters are just example, 3rd one is password witch is not needed because password is automatically set to be same as username (ytm3/ytm3)

Now redeploy application with:

youtestme/trunk/www\_source/build.dep.applnc.sh

## Load data

Files:

Load script:

youtestme\trunk\batch\_source\scripts\data\_load\LoadClassroom2020Data

Data base connections:

youtestme\trunk\batch\_source\conf\dbconnections

ytm.properties:

youtestme\trunk\batch\_source\conf\ytm.properties

Error log:

youtestme\trunk\batch\_source\scripts\data\_load\log\LoadClassroom202Data

To load data, configure dbconnections file and at the bottom of the file add a line like this :

YTM1-BOJAN, YTM15 Database - Oracle 12c on .35, jdbc:oracle:thin:@192.168.1.35:1521/orcl, ytm15, ytm15, oracle.jdbc.driver.OracleDriver

Yellow – this is the name of connection you can put anything you want

Red – username and password specified in db creation

Copy ytm.properties and name lets say ytm.bojan.properties, in that file change section:

db\_connection\_id=YTM1-BOJAN

Edit LoadClassroom2020Data, change section:

SET PROP\_FILE=%ZYTM\_ROOT%\batch\_source\conf\ytm.bojan.properties

Open cmd and execute LoadClassroom202Data.

Check error log file if there is any.

## Implementation

There are various ways to implement virtual machine depending on software client is using. We have to be prepared for everything. It is good practice to have both export and regular files (not exported just copied). Exported files \*.ova \*.ovf etc.

To Import virtual machine on remote ESXi server, using workstation first import virtual machine ( to you computer,client) > upload to remote server.

There can be problem with using vmware vSphere client for import because it can’t support virtualization above 9, and we are using 11 at the moment.

## Testing mail server with Python script

Call script to send test email

Location: \res\trunk\Scripts\Unix\email.sh

Content:

#!/usr/bin/python2.7

import smtplib

import email

import os

fromaddr = 'somename@mail.youtestme.com'

toaddrs = 'youremail@gmail.com'

msg = "testing" <-change to any message you want

# Credentials (if needed) Credentials of mail server

username = 'username'

password = 'password'

# The actual mail send

server = smtplib.SMTP('mail.youtestme.com:587') <- mailserver:port

server.ehlo()

#server.starttls()

server.login(username,password)

server.sendmail(fromaddr, toaddrs, msg)

server.quit()

Mail server can also be checked at :

http://mxtoolbox.com/

telnet mailserver port

if connected execute "quit" this means server is working.

## Problem with sending mails from application

Application required encription to send emails, because of that some email server don't send mails from application even if you can connect/send from outlook.

Error message:

javax.mail.MessagingException: Could not convert socket to TLS;

This can be checked with sending email with outlook, python script, connecting with telnet but application doesnt send mails.

Note: This is fixed.

## Checking build log

Log in as ytm[n] user or if you are logged in as root execute "su - ytm1"

Rebuild application:

$ cd /home/ytm1/ytm/youtestme/www\_source/

./build.dep.applnc.sh

If build failed :

$ cd /home/ytm1/ytm/youtestme/www\_source/log/

Check the latest log file for errors with vi editor.

## How to collect important system information from VM

Login to YTM Virtual Machine as “root” user and execute system diagnostics script:

/root/ytm/unix/ytm/ytm\_linux\_diagnostics.sh

Script will produce log file “ytm\_linux\_TIMESTAMP.log” with relevant system information about disk space, running processes, application packages, network statistics and etc . **TIMESTAMP** represents execution time of the script.

Log file is located in this directory: **/root/log**

## How to fix VirtualBox Clipboard not working

Kill Vbox client:

[developer@localhost ~]$ ps -ef|grep clip

503 5140 1 0 14:07 ? 00:00:00 /usr/bin/VBoxClient --clipboard

503 5141 5140 0 14:07 ? 00:00:00 /usr/bin/VBoxClient --clipboard

503 5174 5075 0 14:09 pts/0 00:00:00 grep clip

[developer@localhost ~]$

kill -9 5140

kill -9 5141

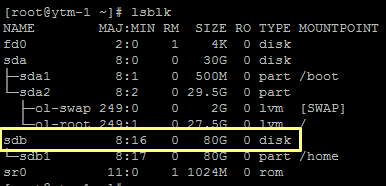
Stat again vbox client with:

/usr/bin/VBoxClient –clipboard

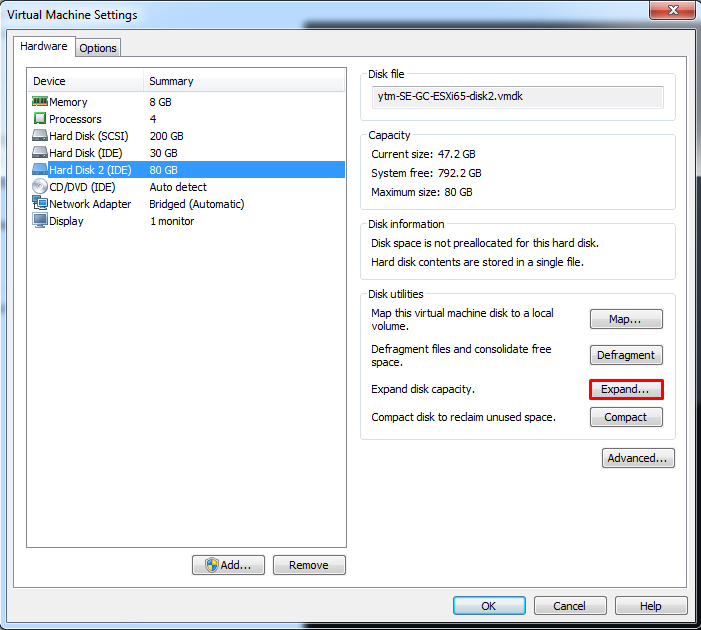
It runs in background by default

# How to resize a partition using fdisk

1. Identify which hard should be resized by its size using “lsblk” command:



1. Power-off Virtual Machine
2. Delete all snapshots in order to be able to increase size of disk
3. Increase size of specific hard disk using VMware Workstation utility:



1. Power-on Virtual machine and check new size of disk using “lsblk” command
2. Unmount the partition:

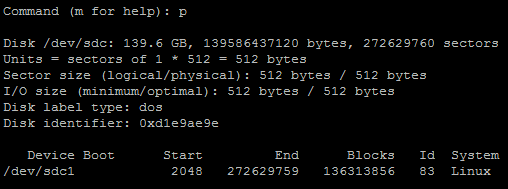
umount /dev/sdc1

Note: If occurs “target is busy”, stop all running tomcat intances, stop the oracle listener and shut down the oracle database as “sys” user. It’s also recommended to switch in single user mode using the “init 1” linux command as root user. At the end of resize process, start them all and go back to runlevel 5.

1. Run **fdisk disk\_name**:

fdisk /dev/sdc

1. Check the partition number you wish to delete with the **p**. The partitions are listed under the heading “Device”:



1. Use the option **d** to delete a partition. If there is more than one, **fdisk** prompts for which one to delete.
2. Use the option **n** to create a new partition. Follow the prompts and ensure you allow enough space for any future resizing that is needed.

*Note:* It is recommended to follow **fdisk**’s defaults as the default values (for example, the first partition sectors) and partition sizes specified are always aligned according to the device properties.

1. Check the partition table to ensure that the partitions are created as required using the **p** option.
2. Write the changes with the **w** option when you are sure they are correct. Use ‘quit’ to exit prompt.
3. Run **fsck** on the unmounted file system:

e2fsck -f /dev/sdc1

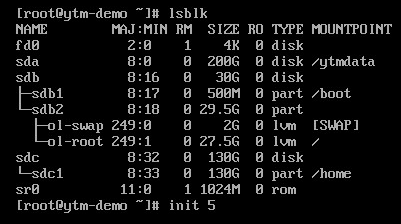
1. Resize the file system with the **resize2fs */dev/device***command.

resize2fs /dev/sdc1

1. Mount the file system and partition:

mount /dev/sdc1 /home

1. Check new state of disk using **lsblk** command:



# Tomcat native APR

Tomcat can use the Apache Portable Runtime to provide superior scalability, performance, and better integration with native server technologies. The Apache Portable Runtime is a highly portable library that is at the heart of Apache HTTP Server 2.x. APR has many uses, including access to advanced IO functionality (such as sendfile, epoll and OpenSSL), OS level functionality (random number generation, system status, etc), and native process handling (shared memory, NT pipes and Unix sockets).

These features allows making Tomcat a general purpose webserver, will enable much better integration with other native web technologies, and overall make Java much more viable as a full fledged webserver platform rather than simply a backend focused technology.

## Install tomcat library using bash scripts

Run this script as root to install Tomcat native APR on all 10 ytm users.

Script path:

youtestme\trunk\scripts\unix\ytm\10\_commandments\install\_10\_tcnative

Check the “catalina.out” log file for APR to see if the installation was successful.

This script written by Bojan is outdated and should be tested again.

SVN location of new script:

/res/trunk/Scripts/Unix/util/tc-native-install.sh

## Install tomcat library step by step

The procedure is documented and stored in SVN directory:

/admim/trunk/System Administration/ YTM Install Tomcat Native Library.docx

# Using Log4j

This section explains how to configure Tomcat to use **log4j** rather than *java.util.logging* for all Tomcat's internal logging.

The following steps describe configuring **log4j** to output Tomcat's internal logging:

1. Copy a file called *log4j.properties* from the following directory into $CATALINA\_BASE/lib.

http:/svn.mallocinc.com/res/trunk/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/lib/

1. Download **Log4J** (Tomcat requires v1.2.x)
2. Download or build *tomcat-juli.jar* and *tomcat-juli-adapters.jar* that are available as an "extras" component for Tomcat. This *tomcat-juli.jar* differs from the default one. It contains the full Apache Commons Logging implementation and thus is able to discover the presence of log4j and configure itself.
3. Put *log4j.jar* and *tomcat-juli-adapters.jar* from "extras" into $CATALINA\_HOME/lib
4. Replace $CATALINA\_HOME/bin/*tomcat-juli.jar* with *tomcat-juli.jar* from "extras"
5. Delete $CATALINA\_BASE/conf/*logging.properties* to prevent *java.util.logging* generating zero length log files
6. Start Tomcat

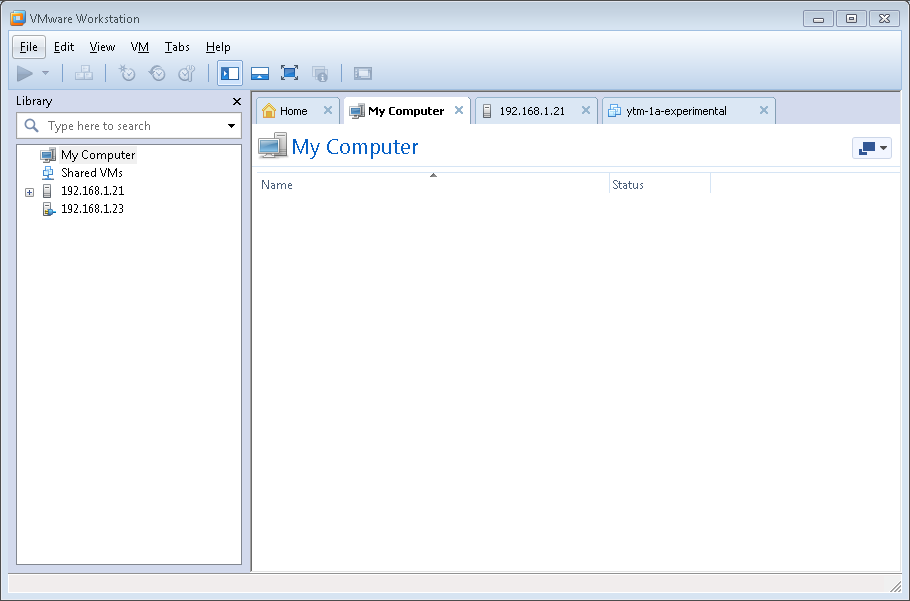
# Converting VirtualBox Appliance to VMware

This procedure explains how to convert VirtualBox appliance to VMware.

## Export VM appliance from VirtualBox

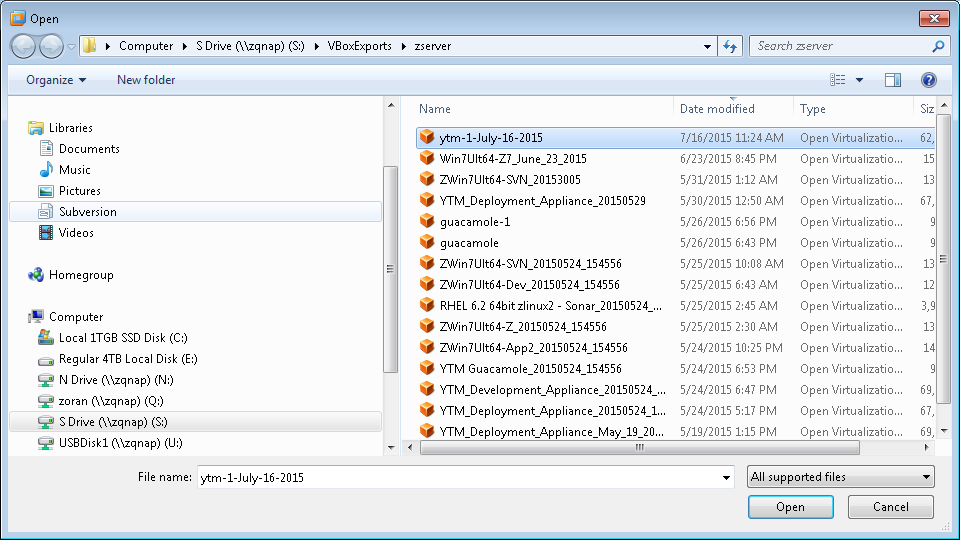
1. Open Oracle VirtualBox
2. Shut down VM that you want to export
3. Select VM that you want to export
4. Go to “File” -> “Export Appliance”
5. Choose location and name of the “OVA” file to be created
6. Leave other parameters as they are (Format “OVF 1.0” and “Write manifest file “unchecked”)

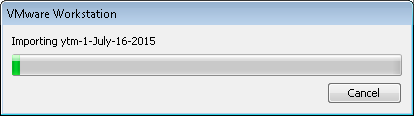
### Start VMware Workstation



### Import VirtualBox “\*.OVA” file

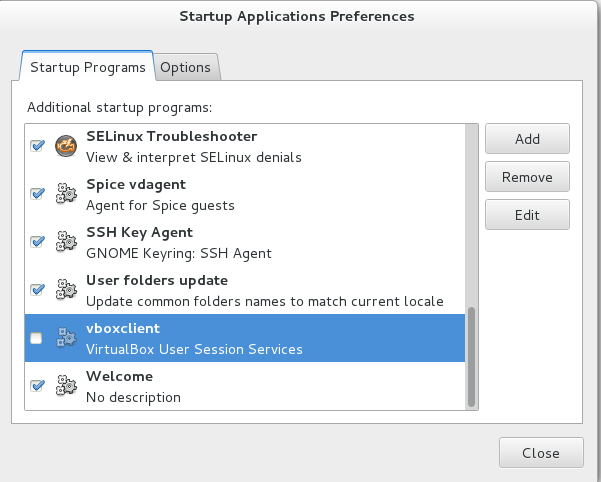
Go to “File” -> “Open” and choose “\*.OVA” file exported from VirtualBox.





### Disable “vboxclient” so it does not run on server start-up.

1. Start Imported VM
2. Log in as “root”
3. Go to “



### Change IP Address

IP address should be changes as soon as possible so it is not in conflict with another IP.

To enable/disable GUI networking interface execute following commands:

To enable:

# systemctl enable NetworkManager

# systemctl start NetworkManager

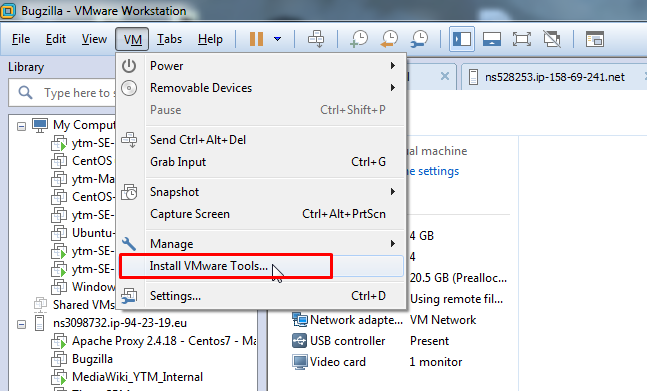
To disable

# systemctl disable NetworkManager

# systemctl stop NetworkManager

1. Log in as “root”
2. Change IP address (edit file **/etc/sysconfig/network-scripts/ifcfg-enp0s3)**Note that IP address cannot be changed through GUI any more – that is disabled for security reasons.
3. Restart server (command “reboot”)
4. Verify that IP address is changed with command (alias) “showip”.

### Install VMware Tools



In order to complete this procedure, you need to be logged in as “root” user.

If YTM Appliance is deployed over VMware product you should install VMware-tools. This will ensure best performances and system stability.

1. Power on the virtual machine

2. In VMware software choose “VM” and “Install VMware tools”. The guest operating system mounts the VMware Tools Installation virtual CD.

3. As root (su -) copy VMwareTool-version.tar.gz file into /tmp directory.

cp /run/media/root/VMware\ Tools/VMwareTools-version.tar.gz /tmp

4. Untar the VMware Tools tar file:

tar –xvzf /tmpVMwareTools-version.tar.gz -C /tmp

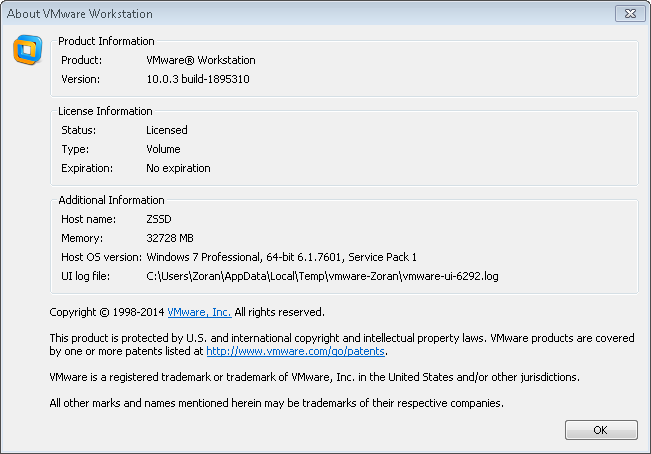
5. Run the VMware tools tar installer:

cd /tmp/vmware-tool-distrib

./vmware-install.pl

6. Respond to the configuration questions on the screen. Press Enter to accept the default value

### VMware version used for this conversion



# Automate Application Start-up

YTM1 application should start automatically on VM Boot.

This means that Tomcat for user YTM1 should start at VM boot.

Script path:

youtestme\trunk\scripts\unix\ytm\ytm1-tomcat

After SVN update in VM, ytm1-tomcat script is located in:

root/ytm/unix/ytm/ytm1-tomcat

Move ytm1-tomcat in /etc/init.d/

# cd /root/ytm/unix/ytm/

# mv ytm1-tomcat /etc/init.d/

Make links to the script:

# ln -s /etc/init.d/ytm1-tomcat /etc/rc1.d/K99ytm1-tomcat

# ln –s /etc/init.d/ytm1-tomcat /etc/rc2.d/S99ytm1-tomcat

# reboot

Test script with:

- After reboot run istomcat alias

- /etc/init.d/ytm1-tomcat {start|stop}

# Start VM on boot

Create file /etc/default/virtualbox

# vi /etc/default/virtualbox

# virtualbox defaults file  
VBOXAUTOSTART\_DB=/etc/vbox  
VBOXAUTOSTART\_CONFIG=/etc/vbox/autostart.cfg

# Create file /etc/vbox/autostart.cfg change username

# Default policy is to deny starting a VM, the other option is "allow".

default\_policy = deny

# Create an entry for each user allowed to run autostart

username = {

allow = true

startup\_delay = 10

}

# chgrp vboxusers /etc/vbox

# chmod 1775 /etc/vbox

#usermod -G wheel,vboxusers username

$ VBoxManage setproperty autostartdbpath /etc/vbox

$ VBoxManage modifyvm someVMname --autostart-enabled on

# service vboxautostart-service restart

To disable auto start of virtual machine execute:

$ VboxManage modifyvm someVMname --autostart-enabled off

# Relocating repository

cd res/

svn info

svn relocate [http://svn.mallocinc.com/res/trunk](http://svn.mallocinc.com/res/trunk" \t "_blank)

Repeat for every unix user ytm?

Run “svn info” to check the exact path after the svn url, htttp://svn.macllocinc.com/…

Note: it is important to check path with “svn info” because every user doesn’t have the same path.

**Example from the command line:**

svn relocate http://home.mallocinc.com:59880/svn/res/trunk http://svn.mallocinc.com/res/trunk

Where:

Old URL: http://home.mallocinc.com:59880/svn/res/trunk

New URL: http://svn.mallocinc.com/res/trunk

# Building Android Application

SVN path: youtestme/trunk/

New folder: ytm.rest.api ( replacement for ytm.webview )

Android build script:

youtestme/www\_source/build/linux/ build.dep.applnc.android.sh

Android xml file:

youtestme/www\_source/build/linux /build.dep.applnc.android.xml

# Extended Data Types with VARCHAR2(32767)

## Documentation

https://docs.oracle.com/database/121/SQLRF/sql\_elements001.htm#SQLRF30020

Extended Data Types

Beginning with Oracle Database 12c, you can specify a maximum size of 32767 bytes for the VARCHAR2, NVARCHAR2, and RAW data types. You can control whether your database supports this new maximum size by setting the initialization parameter MAX\_STRING\_SIZE as follows:

• If MAX\_STRING\_SIZE = STANDARD, then the size limits for releases prior to Oracle Database 12c apply: 4000 bytes for the VARCHAR2and NVARCHAR2 data types, and 2000 bytes for the RAW data type. This is the default.

• If MAX\_STRING\_SIZE = EXTENDED, then the size limit is 32767 bytes for the VARCHAR2, NVARCHAR2, and RAW data types.

## Impact

https://docs.oracle.com/cloud/latest/db121/REFRN/refrn10321.htm#REFRN10321

## Procedure

https://www.toadworld.com/platforms/oracle/b/weblog/archive/2014/04/25/extended-data-types-with-varchar2-32767

Procedura je sledeca:

log in to unix za user oracle

sqlplus sys as sysdba

execute these statements in sql\*plus:

SHUTDOWN IMMEDIATE

STARTUP UPGRADE

ALTER SYSTEM SET max\_string\_size=extended;

@/home/oracle/app/oracle/product/12.1.0/dbhome\_1/rdbms/admin/utl32k.sql

SHUTDOWN IMMEDIATE

STARTUP

check for invalid objects:

select \* from all\_objects

where status = 'INVALID'

and owner like 'YTM%';

# Adding additional hard disks

Follow the procedure described in document "Adding disk to Linux"

SVN location:

\youtestmedoc\System Administration\Add & Resize disks in Linux.docx

# Enabling UTL\_MAIL package

You have to have an SMTP server that does not require authentication.

[https://docs.oracle.com/database/121/ARPLS/u\_mail.htm#ARPLS71199](https://docs.oracle.com/database/121/ARPLS/u_mail.htm" \l "ARPLS71199)

You must both install UTL\_MAIL and define the SMTP\_OUT\_SERVER.

To install UTL\_MAIL:

[oracle@ytm-5 ~]$ sqlplus sys as sysdba

SQL\*Plus: Release 12.1.0.2.0 Production on Wed Apr 6 12:11:15 2016

Copyright (c) 1982, 2014, Oracle. All rights reserved.

Enter password:

Connected to:

Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production

With the Partitioning, OLAP, Advanced Analytics and Real Application Testing options

SQL>

SQL> @$ORACLE\_HOME/rdbms/admin/utlmail.sql

Package created.

Synonym created.

SQL> @$ORACLE\_HOME/rdbms/admin/prvtmail.plb

Package created.

Package body created.

Grant succeeded.

Package body created.

No errors.

SQL>

# SFTP Server

1. Create sftp group

groupadd sftpusers

1. Create SFTP user

# Configure Tiger VNC Server

### Install VNC server:

yum install -y tigervnc-server

### Configure VNC server for two users:

1. cp /usr/lib/system/system/vncserver@.service /etc/system/system/vncserver-ytm1@.service

2. cp /usr/lib/system/system/vncserver@.service /etc/system/system/vncserver-ytm2@.service

3. Edit both created files in previous steps in order to substitute **<USER>** with the correct user name.

4. systemctl daemon-reload

5. Set password for both users (password is the same for both user):

su - ytm1

vncpasswd

Password: **2youtestme1**

Verify: **2youtestme1**

### Starting VNC Server and enable start on boot

systemctl start vncserver-ytm1@:2.service

systemctl start vncserver-ytm2@:3.service

systemctl enable vncserver-ytm1@:2.service

systemctl enable vncserver-ytm2@:3.service

## Configuring access for user “root”

cp /usr/lib/systemd/system/vncserver@.service [/etc/systemd/system/vncserver-root@.service](mailto:/etc/systemd/system/vncserver-root@.service)

vi [/etc/systemd/system/vncserver-root@.service](mailto:/etc/systemd/system/vncserver-root@.service)

replace “<USER>” with “root”

systemctl daemon-reload

$ vncpasswd

Password:

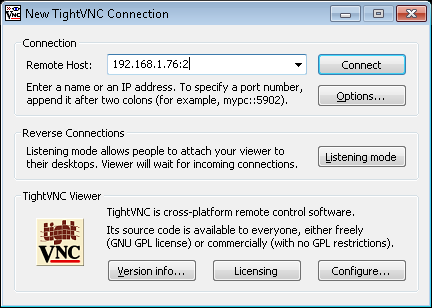
Verify:

systemctl start vncserver-root@:2.service

systemctl enable vncserver-root@:2.service

Accessing VCM server:





## Configuring access for user “ytm1”

cp /usr/lib/systemd/system/vncserver@.service /etc/systemd/system/vncserver-ytm1@.service

vi [/etc/systemd/system/vncserver-ytm1@.service](mailto:/etc/systemd/system/vncserver-ytm1@.service)

replace “<USER>” with “ytm1”

su - ytm1

Last login: Sat Oct 15 10:27:54 EDT 2016

vncpasswd

Password:

Verify:

exit

systemctl start [vncserver-ytm1@:4.service](mailto:vncserver-ytm1@:4.service)

systemctl enable vncserver-ytm1@:4.service

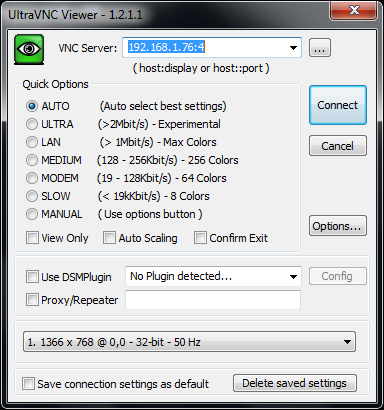
**Impotant**

You need to add port 5904 to firewall ip table:

# vi /etc/sysconfig/iptables

Add line:

-A RH-Firewall-1-INPUT -m state --state NEW -m tcp -p tcp --dport 5904 -j ACCEPT



# Install Sublime text editor

# cd /tmp

# wget https://gist.githubusercontent.com/dkd903/8ba3f51313c1781cc571/raw/f37b1c18547d086cd45e8b484efc518260106ea9/Install\_Sublime\_Text\_3\_64.sh -O install-sublime-text.sh

# chmod +x install-sublime-text.sh

# ./install-sublime-text.sh

# ln –s /usr/local/sublime-text-3/sublime-text-3/sublime\_text /root/Desktop/

To run sublime text editor double click on soft link on desktop or execute command:

/usr/local/sublime-text-3/sublime-text-3/sublime\_text

# Tomcat Configuration

## Tomcat Connection Pools and Connector configuration

Edit tomcat connection pool parameter in files:

res\trunk\ProgramFiles\tomcat\config\deployment\server\_ytm[i].xml

line 154: maxPoolSize="500"

Insert extra parameters in connection tag:

<Connector port="9001" protocol="HTTP/1.1"

maxThreads="1000"

connectionTimeout="60000"

compression="on"

compressableMimeType="text/html,text/xml,text/plain"

redirectPort="8443" />

## JVM Configuration

Edited JVM parameters in file:

res\ProgramFiles\tomcat\apache-tomcat-7.0.34-64bit\bin\catalina.sh

line 99: -Xms512M -Xmx4096M -Xmn1024M -XX:MaxPermSize=512M

Note: **This is not tested with stress testing tools such as Jmeter since the test isn't completed. Writing this note on date 08. November 2016. This should be tested and then configured according to test results.**

# Security hardening

## Check failed log in attempts

/var/log/secure

## Firewall – IPTables

# systemctl stop firewalld

# systemctl disable firewalld

# systemctl enable iptables

# systemctl start iptables

# vim /etc/sysconfig/iptables

\*filter

:INPUT ACCEPT [0:0]

:FORWARD ACCEPT [0:0]

:RH-Firewall-1-INPUT - [0:0]

-A INPUT -j RH-Firewall-1-INPUT

-A FORWARD -j RH-Firewall-1-INPUT

-A RH-Firewall-1-INPUT -i lo -j ACCEPT

-A RH-Firewall-1-INPUT -p icmp --icmp-type any -j ACCEPT

-A RH-Firewall-1-INPUT -p udp --dport 5353 -d 224.0.0.251 -j ACCEPT

-A RH-Firewall-1-INPUT -p udp -m udp --dport 53 -j ACCEPT

-A RH-Firewall-1-INPUT -m state --state ESTABLISHED,RELATED -j ACCEPT

-A RH-Firewall-1-INPUT -m state --state NEW -m tcp -p tcp --dport 22 -j ACCEPT

-A RH-Firewall-1-INPUT -m state --state NEW -m tcp -p tcp --dport 53 -j ACCEPT

-A RH-Firewall-1-INPUT -m state --state NEW -m tcp -p tcp --dport 9001 -j ACCEPT

-A RH-Firewall-1-INPUT -m state --state NEW -m udp -p udp --dport 9001 -j ACCEPT

-A RH-Firewall-1-INPUT -m state --state NEW -m tcp -p tcp --dport 9101 -j ACCEPT

-A RH-Firewall-1-INPUT -m state --state NEW -m udp -p udp --dport 9101 -j ACCEPT

-A RH-Firewall-1-INPUT -m state --state NEW -m tcp -p tcp --dport 1555 -j ACCEPT

-A RH-Firewall-1-INPUT -j REJECT --reject-with icmp-host-prohibited

-A RH-Firewall-1-INPUT -j LOG

-A RH-Firewall-1-INPUT -j DROP

-A INPUT -i enp0s3 -s 10.0.0.0/8 -j LOG --log-prefix "IP DROP SPOOF "

-A INPUT -i enp0s3 -s 172.16.0.0/12 -j LOG --log-prefix "IP DROP SPOOF "

-A INPUT -i enp0s3 -s 192.168.0.0/16 -j LOG --log-prefix "IP DROP SPOOF "

-A INPUT -i enp0s3 -s 224.0.0.0/4 -j LOG --log-prefix "IP DROP MULTICAST "

-A INPUT -i enp0s3 -s 240.0.0.0/5 -j LOG --log-prefix "IP DROP SPOOF "

-A INPUT -i enp0s3 -s 127.0.0.0/8 -j LOG --log-prefix "IP DROP LOOPBACK "

-A INPUT -i enp0s3 -s 169.254.0.0/16 -j LOG --log-prefix "IP DROP MULTICAST "

-A INPUT -i enp0s3 -s 0.0.0.0/8 -j LOG --log-prefix "IP DROP "

-A INPUT -i enp0s3 -s 240.0.0.0/4 -j LOG --log-prefix "IP DROP "

-A INPUT -i enp0s3 -s 255.255.255.255/32 -j LOG --log-prefix "IP DROP "

-A INPUT -i enp0s3 -s 168.254.0.0/16 -j LOG --log-prefix "IP DROP "

-A INPUT -i enp0s3 -s 248.0.0.0/5 -j LOG --log-prefix "IP DROP "

COMMIT

# vim /etc/sysctl.conf

# Turn on execshield

kernel.exec-shield=1

kernel.randomize\_va\_space=1

# # Enable IP spoofing protection

net.ipv4.conf.all.rp\_filter=1

# # Disable IP source routing

net.ipv4.conf.all.accept\_source\_route=0

# # Ignoring broadcasts request

net.ipv4.icmp\_echo\_ignore\_broadcasts=1

net.ipv4.icmp\_ignore\_bogus\_error\_messages=1

# # Make sure spoofed packets get logged

net.ipv4.conf.all.log\_martians = 1

net.ipv4.conf.default.accept\_redirects = 0

net.ipv4.conf.default.secire\_redirects = 0

net.ipv4.tcp\_syncookies = 1

net.ipv4.conf.default.rp\_filter = 1

# systemctl restart iptables

To test iptables rules we can use:

# nmap – checks ports

[root@blinux ~]# nmap -n 192.168.1.214

Starting Nmap 6.40 ( http://nmap.org ) at 2016-06-29 09:31 EDT

Nmap scan report for 192.168.1.214

Host is up (0.00024s latency).

Not shown: 996 filtered ports

PORT STATE SERVICE

22/tcp open ssh

53/tcp closed domain

9001/tcp open tor-orport

9101/tcp open jetdirect

MAC Address: 08:00:27:01:6B:D6 (Cadmus Computer Systems)

Nmap done: 1 IP address (1 host up) scanned in 5.20 seconds

# tcpdump – will sniff internet packets on the host

## Enable Authentication for Single-user mode

This mode is used for system recovery but no authentication is required which means that someone could get into system with root access without password. We will now setup authentication for single-user mode:

# vim /etc/inittab

Add line:

~~:S:wait:/sbin/sulogin

## Disable interactive hotkey startup at boot

# vim /etc/sysconfig/init

PROMPT=no

## Disable time-out for login shells

1.

Create autologout file and append following lines:

# vim /etc/profile.d/autologout.sh

TMOUT=300

readonly TMOUT

export TMOUT

# chmod +x /etc/profile.d/autologout.sh

2.

To setup sshd idle timout time, open “/etc/ssh/sshd\_config” file and append following lines at the end:

# vim /etc/ssh/sshd\_config

ClientAliveInterval 300

ClientAliveCountMax 0

Then restart “ssh” process:

# systemctl restart sshd

### SSH Access

| **#** | **Linux username** | **Default password** | **Description** |
| --- | --- | --- | --- |
|  | ytmlogin | 2ytm1 | OS user with SSH access to the system |
|  | ytmadmin | 2ytm1 | OS user without SSH access with “sudo” privileges |
|  | ytmrecover | 2ytm1 | OS user with SSH access used by YTM team to recover system if all passwords are lost. Password for this user will not be given to the client. |

As user "root":

**Create users " ytmlogin" and “ytmrecover” to be used as users to log in through SSH:**

# useradd ytmlogin

# useradd ytmrecover

**Create user " ytmadmin" with “sudo” privileges without ssh access:**

# useradd ytmadmin

**Set the password for new users "ytmadmin", “ytmlogin” and “ytmrecover”:**

# passwd ytmadmin

# passwd ytmlogin

# passwd ytmrecover

Changing password for user ytmadmin.

New password:

Retype new password:

passwd: all authentication tokens updated successfully.

**Edit "sshd\_config":**

# vi /etc/ssh/sshd\_config

#do not allow user "root" to log in using "ssh"

PermitRootLogin no

#allow only user "ytmadmin" to log in using ssh

AllowUsers ytmlogin ytmrecover

**Comment out the line in “/etc/sudoers” file that starts with “%wheel”:**

%wheel ALL=(ALL) NOPASSWD: ALL

oracle ALL=(ALL) NOPASSWD: ALL

**Add user “ytmadmin” to “wheel” group:**

# usermod -aG wheel ytmadmin

**Test previous operation (output should be “root”):**

# su - ytmadmin

# sudo whoami

**Restart “ssh” process:**

# systemctl restart sshd

### Adding banner (log in message)

vi /etc/ssh/sshd\_config

remove comments as shown below:

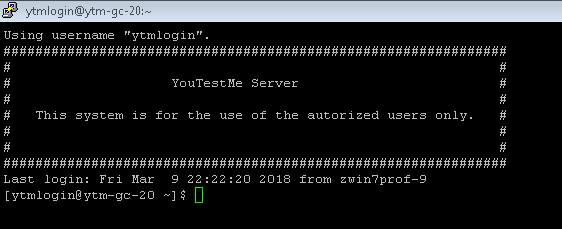
# no default banner path

#Banner none

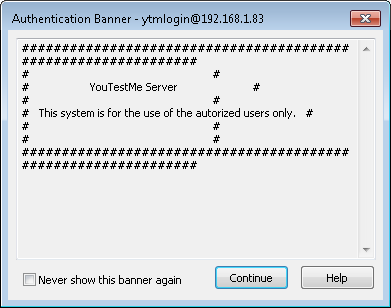
Banner /etc/ssh/sshd-banner

vi /etc/ssh/sshd-banner (now add log in message in this file)

Result:



This message is not in conflict with SFTP:



SFTP works fine after pressing "Continue".

### Changing the default SSH port

Edit the default SSH configuration file by changing the default port number:

# vi /etc/ssh/sshd\_config

# If you want to change the port on a SELinux system, you have to tell  
# SELinux about this change.  
# semanage port -a -t ssh\_port\_t -p tcp #PORTNUMBER  
#  
Port 1759  
#AddressFamily any  
#ListenAddress 0.0.0.0  
#ListenAddress ::

Enable the newly created port through SELinux:

# semanage port -a -t ssh\_port\_t -p tcp 1759

Allow the new port through the firewall:

firewall-cmd --permanent --zone=public --add-port=1759/tcp

Reload the firewall configurations:

# firewall-cmd --reload

Restart ssh by running the command below:

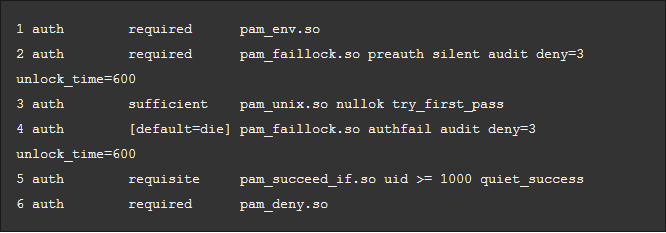
# systemctl restart sshd.service

### Account locking

Follow these steps to configure account locking:

**1**. Add two lines to the auth section of the **/etc/pam.d/system-auth** and **/etc/pam.d/password-auth** files.

Lines number 2 and 4 have been added.



**2.** Add the following line to the account section of both files specified in the previous step:



When user attempts to log in for the fourth time after failing to log in three times previously, his account is locked for 5 minutes upon the fourth attempt:

To view the number of failed attempts per user, run, **as root**, the following command:

# faillock

To unlock a user's account, run, **as root**, the following command:

# faillock --user <username> --reset

### Making SSH session permanently alive

Comment out these two lines in “/etc/ssh/sshd\_config” and reboot machine:

#ClientAliveInterval 30

#ClientAliveCountMax 5

Then restart “ssh” process:

# systemctl restart sshd

## Keep “/boot” as read-only

# vim /etc/fstab

Add following lines:

LABEL=/boot /boot ext2 defaults,ro 1 2

## Ignore ICMP or Broadcast requests

# vim /etc/sysctl.conf

Add following lines:

#Ignore ICMP request:

net.ipv4.icmp\_echo\_ignore\_all = 1

#Ignore Broadcast request:

net.ipv4.icmp\_echo\_ignore\_broadcasts = 1

Note: check if there is already same line in “/etc/sysctl.conf” file.

## Add message at user log in

Create file:

vim /etc/motd

Add following text:

"This is private server and access to it has to be authorized. If you are not authorized, your continued access will expose you to criminal and/or civil proceedings."

## Install ClamAV antivirus software

<https://www.clamav.net/>

|  |  |
| --- | --- |
| yum install -y epel-release | install software |
| freshclam | update virus database |
| clamscan –r / | scan for viruses (entire system “/”) |

# wget <http://dl.fedoraproject.org/pub/epel/7/x86_64/e/epel-release-7-8.noarch.rpm>

# rpm –ivh epel-release-7-8.noarch.rpm

# yum install clamav-server clamav-data clamav-update clamav-filesystem clamav clamav-scanner-systemd clamav-devel clamav-lib clamav-server-systemd -y

# setsebool –P antivirus\_can\_scan\_system 1

### Schedule weekly scan

1. Checkout ytm Unix scripts for diagnostics and maintenance in root $HOME

# mkdir ytm

# cd yt m

# svn co <https://svn.youtestme.com/scm/svn/res/trunk/Scripts/Unix> unix

1. Open crontab as root user

# crontab -e

1. Add job to crontab

# Run AntiVirus every Sunday at Midnight

0 0 \* \* 7 /root/ytm/unix/ytm/system\_diagnostics/ytm\_virus\_scan.sh

In case that ClamAV is installed from source, add full paths to lines freshclam and clamscan in script

/user/bin/local/frashclam

/user/bin/local/clamscan

# Default Oracle Users

<http://www.orafaq.com/wiki/List_of_default_database_users>

| **User** | **Password** | **Purpose** | **Created by** | **Can change password?** | **Can be dropped** | **Dropped in**  **YTM** |
| --- | --- | --- | --- | --- | --- | --- |
| SYS | CHANGE\_ON\_INSTALL or INTERNAL | Oracle Data Dictionary/ Catalog | ?/rdbms/admin/sql.bsq and various cat\*.sql scripts | Yes | No |  |
| SYSTEM | MANAGER | The default DBA user name (please do not use SYS) | ?/rdbms/admin/sql.bsq | Yes | No |  |
| OUTLN | OUTLN | Stored outlines for optimizer plan stability | ?/rdbms/admin/sql.bsq | Yes | No |  |
| SCOTT ADAMS JONES CLARK BLAKE | TIGER WOOD STEEL CLOTH PAPER | Training/ demonstration users containing the popular EMP and DEPT tables | ?/rdbms/admin/utlsampl.sql | Yes | Yes - Drop users cascade from all production environments | Yes |
| HR (Human Resources) OE (Order Entry) SH (Sales History) | HR OE SH | Training/ demonstration users containing the popular EMPLOYEES and DEPARTMENTS tables | ?/demo/schema/mksample.sql | Yes | Yes - Drop users cascade from all production environments | Yes |
| DEMO | DEMO | User for Oracle Data Browser Demonstration (last version 9.2) | ?/rdbms/admin/demo.sql | Yes | Yes - drop user cascade | Yes |
| ANONYMOUS | invalid password | Used by the PL/SQL gateway that enables a Web browser to invoke a PL/SQL stored procedure through an HTTP listener. | ?/rdbms/admin/catqm.sql |  | Yes - drop user if XDB is not used through a Web browser | Yes |
| AURORA$ORB$\  UNAUTHENTICATED | INVALID | Used for users who do not authenticate in Aurora/ORB | ?/javavm/install/init\_orb.sql called from ?/javavm/install/initjvm.sql |  |  |  |
| AWR\_STAGE | AWR\_STAGE | Used to load data into the AWR from a dump file | ?/rdbms/admin/awrload.sql | Yes | Yes - must be dropped in order to use awrload.sql script | Not exist |
| CSMIG |  | User for Database Character Set Migration Utility | ?/rdbms/admin/csminst.sql | Password is given at script call | Yes - drop user cascade (user is dropped and recreated by the script each time it is used) | Not exist |
| CTXSYS | CTXSYS | Oracle interMedia (ConText Cartridge) administrator user | ?/ctx/admin/dr0csys.sql |  |  |  |
| DBSNMP | DBSNMP | Oracle Intelligent agent | ?/rdbms/admin/catsnmp.sql, called from catalog.sql | Yes - put the new password in snmp\_rw.ora file | Yes - Only if you do not use the Intelligent Agents |  |
| DIP | DIP | Generic user account DIP for processing events propagated by DIP. This account would be used by all applications using the DIP provisioning service when connecting to the database | ?/rdbms/admin/catdip.sql, called from catproc.sql | Yes - using "oidprovtool" tool | Yes - using "dbca" if DIP (Directory Integration and Provisioning) is no more used |  |
| DMSYS | DMSYS | Data Mining user | ?/rdbms/admin/odmcrt.sql, called from dminst.sql |  | Yes - drop user cascade | Not exist |
| DSSYS | DSSYS | Oracle Dynamic Services and Syndication Server | ?/ds/sql/dssys\_init.sql |  |  |  |
| EXFSYS |  | User to hold the dictionary, APIs for the Expression Filter | ?/rdbms/admin/exfsys.sql, called from catexf.sql from catrul.sql from catproc.sql | Yes - password given at script execution | Yes - using using catnoexf.sql script |  |
| LBACSYS | LBACSYS | Label Based Access Control owner when Oracle Label Security (OLS) option is used | ?/rdbms/admin/catlbacs.sql, called from catols.sql |  | Yes - using catnools.sql of OLS is no more used |  |
| MDSYS | MDSYS | Oracle Spatial administrator user | ?/ord/admin/ordinst.sql |  |  |  |
| ORACLE\_OCM | ORACLE\_OCM | Owner of packages used by Oracle Configuration Manager | ?/rdbms/admin/catocm.sql, called from dbmsocm.sql, called from catproc.sql | Yes - account is created locked and password expired |  |  |
| ORDPLUGINS | ORDPLUGINS | Object Relational Data (ORD) User used by Time Series, etc. | ?/ord/admin/ordinst.sql |  |  |  |
| ORDSYS | ORDSYS | Object Relational Data (ORD) User used by Time Series, etc. | ?/ord/admin/ordinst.sql |  |  |  |
| PERFSTAT | PERFSTAT | Oracle Statistics Package (STATSPACK) that supersedes UTLBSTAT/UTLESTAT | ?/rdbms/admin/statscre.sql |  |  |  |
| TRACESVR | TRACE | Oracle Trace server | ?/rdbms/admin/otrcsvr.sql |  |  |  |
| TSMSYS | TSMSYS | User for Transparent Session Migration (TSM) a Grid feature | ?/rdbms/admin/cattsm.sql, called from catproc.sql |  | Yes - drop user cascade | Not exist |
| XDB |  | Owner of objects for XDB system | ?/rdbms/admin/catqm.sql |  | Yes - using catnoqm.sql script if XDB is no more used |  |

To drop “administrative” users from oracle:

SQL> drop user anonymous cascade;

drop user anonymous cascade

\*

ERROR at line 1:

ORA-28014: cannot drop administrative users

SQL> alter session set "\_oracle\_script"=true;

Session altered.

SQL> drop user anonymous cascade;

User dropped.

To change password of SYS and SYSTEM users:

SQL> ALTER USER SYSTEM IDENTIFIED BY "password" CONTAINER=ALL;

ALTER USER SYSTEM IDENTIFIED BY "password" CONTAINER=ALL

\*

ERROR at line 1:

ORA-65050: Common DDLs only allowed in CDB$ROOT

SQL> alter session set container=CDB$ROOT;

Session altered.

SQL> ALTER USER SYSTEM IDENTIFIED BY "p6$6NbMoy" CONTAINER=ALL;

User altered.

SQL> ALTER USER SYS IDENTIFIED BY "p6$6NbMoy" CONTAINER=ALL;

User altered.

SQL> quit

# Client Pre-Delivery Tasks

## Pre-delivery check list - Short list

1. Check disk space, it should have at least 2GB free for operating system and at least 100 GB free for database, command “df –h “. Add detailed information how to do this and where to look.
2. Check root password, can I login as root
3. Check ytm1 password, can I login as ytm1
4. Check admin username and password for YTM application
5. Perform sanity check on data, do we see data that we expect to see
6. Set IP address to 192.168.1.100
7. Check if ytm1 cron job is running
8. Start YTM application and log in as Admin
9. Perform sanity check on data – do we see data that we expect to see
10. Edit VM description with most recent and relevant information
11. Setup mail server (optional)

## Check for duplicate IP address

Make sure no other server is running on IP address: 192.168.1.100 before starting VM for the client

ping 192.168.1.100

## Increase RAM

Increase RAM for:

1. Database
2. Tomcat

Minimal values have to be determined during the testing and final values should be at least double the minimums.

## Increase swap space

1. Create “additional-swap” file with dd command.

# dd if=/dev/zero of=/additional-swap bs=1M count=6144

2. Run mkswap command to make swap area

# mkswap /additional-swap

3. Change the permission of the file “additional-swap”

# chmod 600 /additional-swap

4. Edit “/etc/fstab” file for permanent mounting, add following line:

# vim /etc/fstab

/additional-swap swap swap defaults 0 0

5. Mount swap area

# mount -a

6. Enable swap area

# swapon -a

7. Check the number swap space mounted on your system

# swapon -s

8. Check available swap space on the system

# free –h

## Change size of temporary file storage

1. For permanent mounting, paste the below given line in /etc/fstab:

# vim /etc/fstab

none /dev/shm tmpfs defaults,size=10G 0 0

2. # mount -o remount /dev/shm

3. Verify the mounting.

# df -Th

## Limit the Size of Tomcat Log Files

/admin/System Administration/Limit the Size of Tomcat Log iles.docx

## Empty Linux recyclebin

# rm –rfv /root/.local/share/Trash/\*

# rm –rfv /home/oracle/.local/share/Trash/\*

## Purge Database recyclebin

To check content of recycle bin:

SELECT \* FROM RECYCLEBIN;

To purge recycle bin:

PURGE RECYCLEBIN;

Switch to PDB and repeat steps above:

ALTER SESSION SET CONTAINER=PDYTM1;

## Update database statistics

Database statistics update is set to automatic.

Check with:

SELECT CLIENT\_NAME, STATUS FROM DBA\_AUTOTASK\_CLIENT WHERE CLIENT\_NAME='auto optimizer stats collection';

## Check O/S free disk space

Run "df" report and attach it to delivery sheet.

## Purge logs and temporary files

# find /home/ytm1/ -name "\*.log" -exec rm -rfv {} \;

# rm -rfv /tmp/\*

# rm -rfv /var/tmp/\*

## Clean yum cache

# yum clean all

## Virus Scan

Attach log or snapshot of the scan to client delivery sheet.

# clamscan –r --bell –i /home

*Note: There are 5 false positives from oracle. Do not delete those files.*

## Reboot VM ad Perform sanity check

### Verify that application can be accessed on default IP and port

### Verify that tomcat process is running

Tomcat should start with the system start

Type command:

[root@ytm-1 ~]# ps -ef |grep tomcat

You should get something like:

ytm1 2623 1 1 Oct04 ? 02:56:25 /usr/bin/java -Djava.util.logging.config.file=/home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/conf/logging.properties -Djava.util.logging.manager=org.apache.juli.ClassLoaderLogManager -Xms1500M -Xmx1500M -Xmn400M -XX:MaxPermSize=384M -XX:CMSInitiatingOccupancyFraction=75 -XX:+UseCMSInitiatingOccupancyOnly -XX:+ScavengeBeforeFullGC -XX:+DisableExplicitGC -verbose:gc -Djava.endorsed.dirs=/home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/endorsed -classpath /home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/bin/bootstrap.jar:/home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/bin/tomcat-juli.jar -Dcatalina.base=/home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit -Dcatalina.home=/home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit -Djava.io.tmpdir=/home/ytm1/ytm/res/ProgramFiles/tomcat/apache-tomcat-7.0.34-64bit/temp org.apache.catalina.startup.Bootstrap -config /home/ytm1/ytm/res/ProgramFiles/tomcat/config/deployment/server\_ytm1.xml start

root 12626 12592 0 21:24 pts/0 00:00:00 grep --color=auto tomcat

[root@ytm-1 ~]#

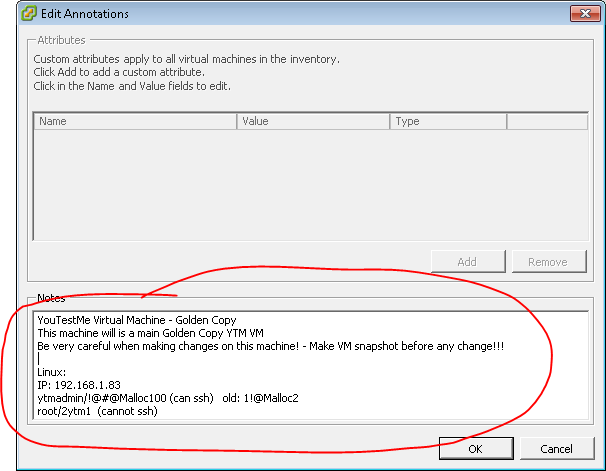
### Try to access application on local host URL

http://localhost:9001

### Edit VM Settings Information

NOTE: this is the information that client will see when they install VM. It should contain accurate, up to date and relevant information about VM.

Please see picture below.



## Zip VM using 7Zip format

Apparently 7z format shrinks VM the most.

## Copy VM to S Drive for backup

S:\VMExports\Golden Copies\YTM\Deployment Appliance\

## Upload VM File to FTP Site

What is the command? Script?

## Download VM from FTP Site and perform Sanity Check

If possible leave machine running for few days and check after that period.

## Fill in delivery inventory

\youtestmedoc\Sales\Documentation for clients\YouTestMe - Software Delivery Inventory.xlsx

## Check tasks from other document

\youtestmedoc\Sales\Documentation for clients\YouTestMe - Delivery List.docx

# Clients VM Hosted by YouTestMe

This paragraph explains handling of the YTM Virtual Machine when YTM is hosting this VM for Clients.

## Hosting Strategy

Client will share same Virtual Machine meaning that on the same virtual machine we will host applications for multiple clients.

Each client will have their own O/S user instance of Tomcat and application installed.

All clients will share the same instance of the database however each client will have its own database schema.

## Naming conventions

O/Sand database users will be called as per table below:

| **#** | **Client** | **Oracle user id** | **UNIX user Id** | **Default passwords** |
| --- | --- | --- | --- | --- |
|  | Client 1 | ytm1 | ytm1 | ytm123! |
|  | Client 2 | ytm2 | ytm2 | ytm123! |
|  | Client 3 | ytm3 | ytm3 | ytm123! |

## Backup Strategy

### Requirements

1. Create a snapshot of the VM before and after EVERY change on VM (i.e. implementation of new software, upgrades, change in configuration, etc. )
2. Create a snapshot of the VM every 30 days after last snapshot is taken
3. Export VM to file before every upgrade and store file on secure location (should be done when client is not using VM)
4. Export VM every 60 days after last export to file (should be done when client is not using VM)
5. Data export using data pump every work day (Monday to Friday) during the period when system is having minimal activity (i.e. during the night). Data Export files should be stored on secure location. Data files should be tested for usability at least twice a month by trying to import them into a test database. Database backup files should be kept for 30 days, meaning that files older than 30 days can be deleted.

### Implementation

The bash script “ftp\_backup\_upload.sh” implements database backup in several phases:

1. export database in “.dmp” file using “expdp” command
2. eventually, compress “.dmp” file before storing it (currently not implemented)
3. store exported backup file in OVH FTP server
4. store exported backup file in NAS in Belgrade
5. delete backup file older than some specific amount of time
6. inform several people in the company by email in case of backup failure
7. test backup files by trying to import them in the “test” schema

The scripts for database backup and database data verification:

http://svn.mallocinc.com/res/trunk/Scripts/Unix/util/client\_database\_backup\_and\_restore/ftp/

Copy the backup file to NAS in Belgrade (SSH passwordless authentication have to be enabled):

scp -P 45721 ${backup\_file} proxy\_username@homebg.mallocinc.com:/media/NAS/ \

System\_Administration/FTP/customer\_database\_backups/

Add “ftp\_backup\_upload.sh” to crontab to backup customer database every day except weekends:

0 3 \* \* 1-5 /home/oracle/backup/ftp\_backup\_upload.sh

## Tightening Access to Oracle Database

Oracle has a capability to limit access to the database by IP address.

Examples, first method out of two listed below is preferred:

<http://www.dba-oracle.com/t_blocking_listener_ip_addresses.htm>

<https://community.oracle.com/thread/3796786?start=0&tstart=0>

Limit access to Client's Oracle database only to local server and to IP address of the Belgrade office.

If somebody wants to access clients database(i.e. for support) from outside Belgrade office, he/she would need to log in to VPN of Belgrade office and then to the database.

VPN access is has to be set on router in Belgrade. Various users need to be created.

Please document procedure in practical manner so everybody who needs to support client database can easily log in using that procedure.

Test all this first on dev VM on dev server.

### Limit Oracle access by IP addresses

1. Locate SQLNET.ORA file on client’s VM:

cd $ORACLE\_HOME/network/admin

1. Open it up and insert the following line:

tcp.validnode\_checking = yes

tcp.invited\_nodes = (localhost, 185.190.154.193)

1. Restart the listener (do this as oracle user):

lsnrctl stop

lsnrctl start

This procedure defines how to allow access to client’s database only from office in Belgrade. In practice, OpenVPN config file (.ovpn) will be distributed via email to all members of the team that have permission to remotely access client’s database out of office in Belgrade.

To disable this feature, just delete two inserted line in **sqlnet.ora** file and restart listener.

**How to connect to OpenVPN server with your device**:

\youtestmedoc\Procedures\Development Procedures\ YTM Connect to openVPN Server.docx

## Tightening Access to Client’s VM

To limit ssh access to a client’s VM based on originating IP address, edit /etc/hosts.allow:

sshd : localhost : allow

sshd : 185.190.154.193 : allow

sshd : ALL : deny

The above entry will allow ssh access from localhost and from office in Belgrade. All other IP addresses will be denied access to sshd.

Notes:

1. You can allow or deny based on ip address, subnet, or hostname.
2. List rules in order of most to least specific. The file only gets read until a matching line is found, so if you start with **ssdh : ALL : deny**, no ssh connections will be allowed.

## Assigning URL

1. Add this block of code to the end of file /etc/httpd/conf.d/httpd-vhosts.conf on the proxy server that can access the application

<VirtualHost \*:80>

ServerName <context path>.youtestme.com

Redirect / https://<context path>.youtestme.com/

</VirtualHost>

<VirtualHost \*:443>

ServerName <context path>.youtestme.com

SSLEngine on

SSLProtocol all -SSLv2

SSLCertificateFile /etc/ssl/certs/youtestme/youtestme.com\_ssl\_certificate.cer

SSLCertificateKeyFile /etc/ssl/certs/youtestme/youtestme.key

SSLCertificateChainFile /etc/ssl/certs/youtestme/youtestme.com\_ssl\_certificate\_INTERMEDIATE.cer

ProxyRequests Off

ProxyPreserveHost Off

RewriteEngine on

RewriteCond %{REQUEST\_URI} ^/$

RewriteRule (.\*) /<context path>/ [R=301]

ProxyPass /<context path>/ ajp://<ip address>:9101/<context path>/

ProxyPassReverse /<context path>/ ajp://<ip address>:9101/<context path>/

</VirtualHost>

1. Replace <context path>, <ip address>, and <subdomain> with correct values.
2. For applications that use proctorio, add the following header to VirutalHost (443):

Header edit Set-Cookie ^(.\*)$ $1;HttpOnly;Secure;SameSite=None

# Creating Standby Site

The goal is to copy the client schemas to standby YTM Virtual Machine at least once a day. All logic is implemented in bash script “/res/trunk/Scripts/Unix/ytm/system\_upgrade/ytm\_copy\_db\_to\_new\_vm.sh”.

The easiest way to set up the environment is to copy “ytm\_copy\_db\_to\_new\_vm.sh” script in “tmp” directory in user’s home directory and schedule cronjob in crontab file for specific client schema.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

0 3 \* \* 1-5 /home/ytm1/tmp/ytm\_copy\_db\_to\_new\_vm.sh 192.99.24.210 1555 2ytm1 ytm1

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

If there are many (more than 3, for example) client schemas to be copied, the more efficient solution would be to create a wrapper script that will invoke the basic script with different arguments in the loop and to place the wrapper script in crontab file.

# Installing and Configuring Postgres Database

## Install the software

<https://www.postgresql.org/download/linux/redhat/>

Execute these commands as "**root**":

1. yum install https://download.postgresql.org/pub/repos/yum/10/redhat/rhel-7-x86\_64/pgdg-oraclelinux10-10-2.noarch.rpm
2. yum install postgresql10
3. yum install postgresql10-server
4. /usr/pgsql-10/bin/postgresql-10-setup initdb
5. systemctl enable postgresql-10
6. systemctl start postgresql-10

## Edit configuration files

As O/S user "**postgres**":

#1:

vi /var/lib/pgsql/10/data/pg\_hba.conf

Replace yellow line with green:

**#host all all 127.0.0.1/32 ident**

**host all all 0.0.0.0/0 md5**

#2:

vi /var/lib/pgsql/10/data/postgresql.conf

Uncomment these two lines:

**listen\_addresses = '\*'**

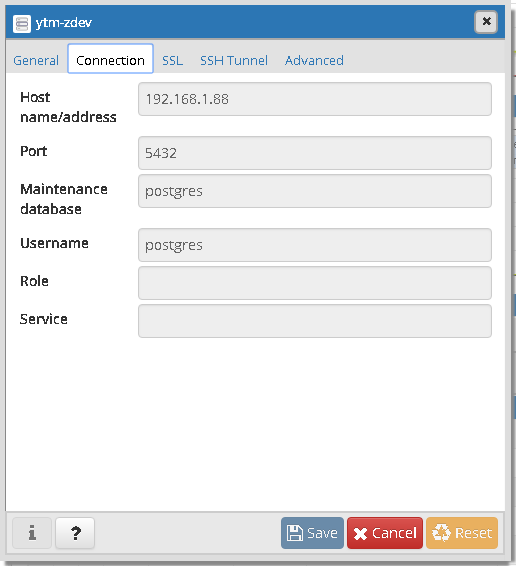
**port = 5432 # (change requires restart)**

#3:

**mkdir -p /ytmdata/postgres/tablespaces/ytm1**

## Connect to database

Default username/password: postgres/postgres

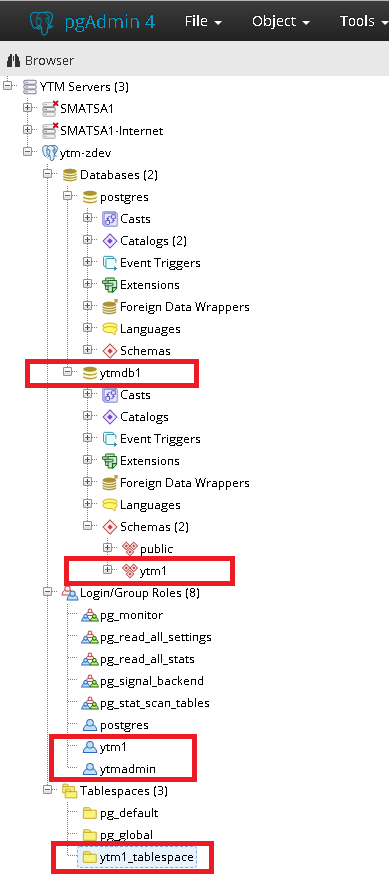


Create database user ids:

| **Username** | **Password** | **Comment** |
| --- | --- | --- |
| ytmadmin | AyTm2018pw1 | Admin user |
| ytm1 | yTm2018pw1 | Application user |
| postgres | PyTm1820pW1 | Built in Admin user  Only change password for this user |

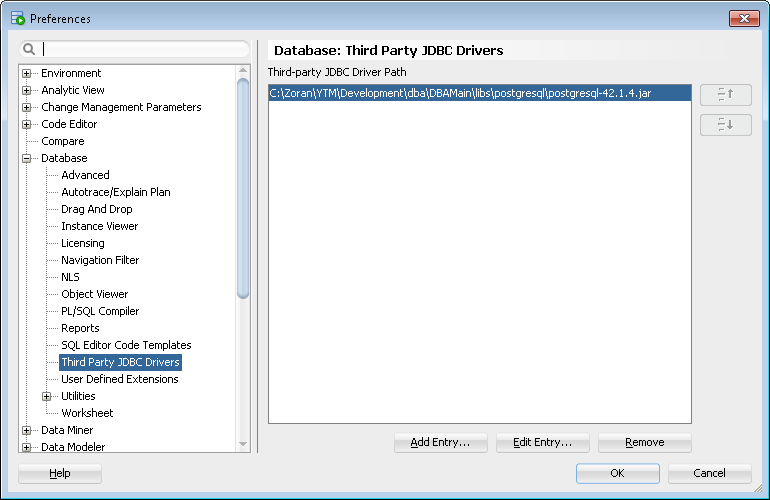
## Database Objects

Create below database objects



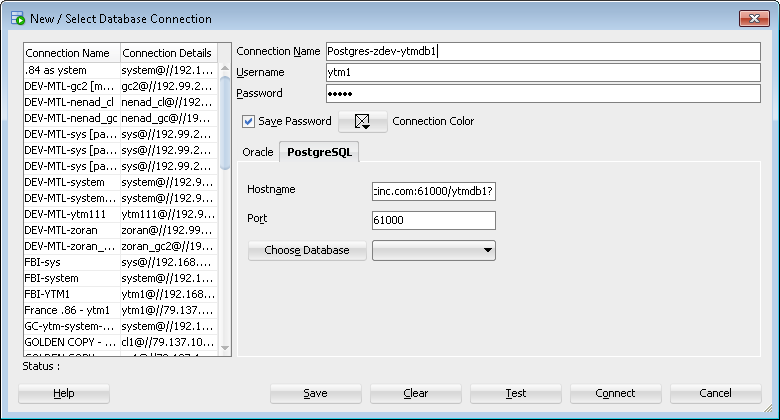
## Database Connection in SQL\*Developer

Add Postgres JDBC Driver



Valid connections URLs (put entire URL under "Hostname"):

* home.mallocinc.com:61000/ytmdb1?
* 192.168.1.88:5432/ytmdb1?



## Move PostgreSQL Data to Larger Partition

It is preferable to move the PostgreSQL data directory to a larger partition to allow more space for user data. By default, the PostgreSQL home directory is: /var/lib/pgsql, and its location should not be changed but only of its content. Execute the commands as “root” user:

1. systemctl stop postgresql-10
2. systemctl disable postgresql-10
3. mkdir /ytmdata/pgsql
4. cp -aRp /var/lib/pgsql/\* /ytmdata/pgsql
5. chown -R postgres:postgres /ytmdata/pgsql
6. mv /var/lib/pgsql /var/lib/pgsql.backup
7. mkdir /var/lib/pgsql
8. mount -obind /ytmdata/pgsql /var/lib/pgsql
9. systemctl start postgresql-10 && systemctl enable postgresql-10

It’s necessary to add the following line in “/etc/fstab” file to make the mount operation permanent:

/ytmdata/pgsql /var/lib/pgsql none defaults,bind 0 0

## PostgreSQL Connection Over SSL

We will use encrypted connection for PostgreSQL databases on remote machines. Procedure for allowing PostgreSQL to use SSL connection (using Self Signed Certificate):

1. Go to PostgreSQL configuration folder (as root user):

# cd /var/lib/pgsql/10/data/

1. Generate private key

# openssl genrsa -des3 -out server.key 1024

1. Remove passphrase

# openssl rsa -in server.key -out server.key

1. Set appropriate permission

# chmod 400 server.key

# chown postgres.postgres server.key

1. Create the server certificate

# openssl req -new -key server.key -days 3650 -out server.crt -x509 -subj '/C=CA/ST=Toronto/L=Comox/O=youtestme.com/CN=youtestme.com/emailAddress=test@youtestme.com'

1. We are using our certificate as root certificate, so:

# cp server.crt root.crt

1. Create user keys

# openssl genrsa -des3 -out /tmp/postgresql.key 1024

# openssl rsa -in /tmp/postgresql.key -out /tmp/postgresql.key

# openssl req -new -key /tmp/postgresql.key -out /tmp/postgresql.csr -subj '/C=CA/ST=Toronto/L=Comox/ O=youtestme.com/CN=www-data'

# openssl x509 -req -in /tmp/postgresql.csr -CA root.crt -CAkey server.key -out /tmp/postgresql.crt -CAcreateserial

1. Transfer files from /tmp to client machine
2. Add line to pg\_hba.file

hostssl all postgres 0.0.0.0/0 md5 clientcert=1

1. Enable ssl in postgresql.conf
2. Add path to root.crt in postfresql.conf
3. Restart PostgreSQL

### Useful Links

[PostgreSQL: Documentation: 10: 18.9. Secure TCP/IP Connections with SSL](https://www.postgresql.org/docs/10/ssl-tcp.html)

[SSL Certificates For PostgreSQL](https://www.howtoforge.com/postgresql-ssl-certificates)

# GUI Customization

## Login Screen Logo

1. Create or edit the gdm profile in /etc/dconf/profile/gdm which contains the following lines:

user-db:user

system-db:gdm

file-db:/usr/share/gdm/greeter-dconf-defaults

1. Create a gdm database for machine-wide settings in /etc/dconf/db/gdm.d/01-logo:

[org/gnome/login-screen]

logo='/usr/share/pixmaps/ytm-logo.png'

1. Copy logo in png format without background on location /usr/share/pixmaps/ytm-logo.png. Original size of image is H80p W225p
2. Update system database:

# dconf update

## Wallpaper Image

## Application Icon Replacement