



# DBaaS: Taking Advantage of Oracle Cloud Database



**Presented by: John Jay King**

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# Session Objectives



- Become aware of the main features of Oracle's Database As A Service (DBaaS)
- Learn how to provision a new database instance using Oracle DBaaS
- See how Oracle DBaaS is used from applications

# Who Am I?



- John King – Partner, King Training Resources
- Oracle Ace Director 
- Member Oak Table Network 
- Providing training to Oracle and IT community for over 25 years – <http://www.kingtraining.com>
- “Techie” who knows Oracle, ADF, SQL, Java, and PL/SQL pretty well (along with many other topics)
- Member of AZORA, ODTUG, IOUG, and RMOUG
- One of those “dog-spoiling” people





- Providing customized training solutions since 1988 in the US and internationally
- Oracle topics include: SQL, PL/SQL, Database, Cloud, APEX, ADF, MAF, Forms, Reports, Pro\*C/Pro\*COBOL
- Non-Oracle topics include: UX, Web Services, IoT, Cloud Foundry, REST, Blockchain, Java, JavaScript, HTML5, CSS, jQuery, COBOL, .NET, SQL Server, DB2, Business Analyst, and more
- Visit us at [www.kingtraining.com](http://www.kingtraining.com) for more information and free downloads of presentations and code
- Contact Peggy at 1.303.798.5727 to schedule training today (email: [peggy@kingtraining.com](mailto:peggy@kingtraining.com) )



# Arizona, USA



# Who Are You?

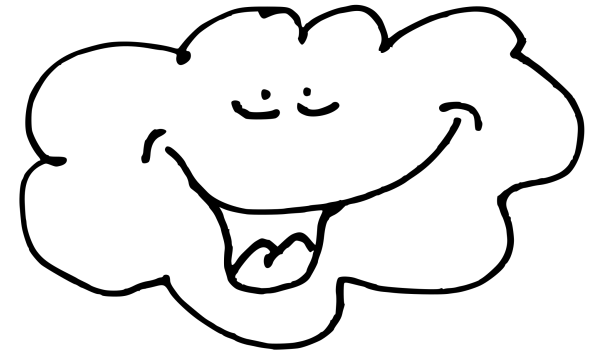


- Application Developer
- DBA
- Business Analyst
- Other?

# The Cloud Is Upon Us!



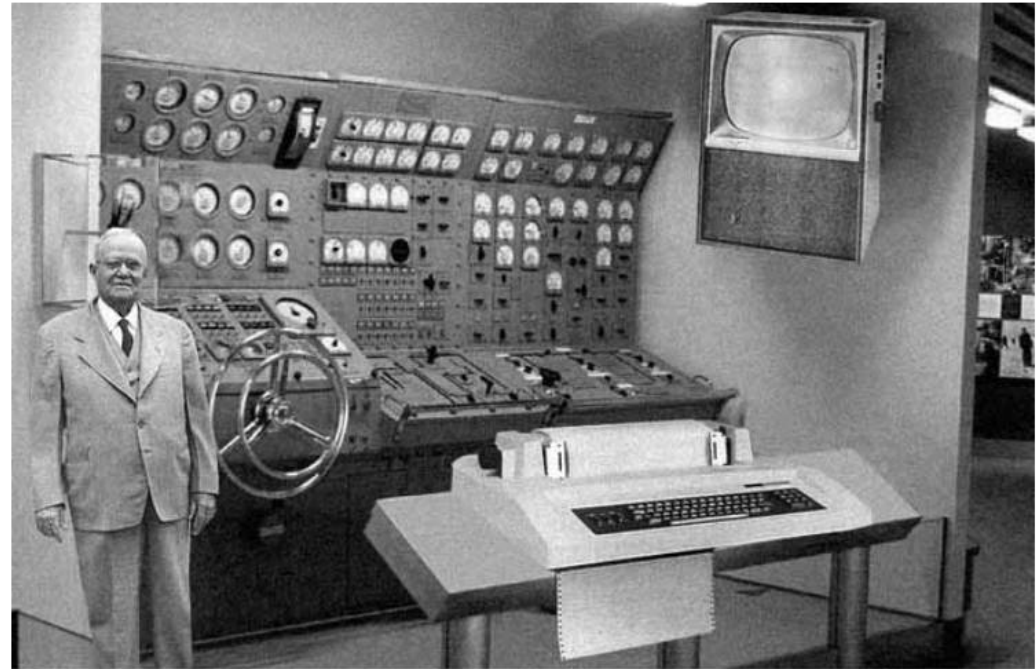
- Everywhere you turn vendors are offering cloud solutions promising (once-again) a single solution to solve the ills of our IT organizations.
- Bah! Some naysayers say “this is just the same-old, same-old, we’ve been doing the cloud for years”  
– hmmm is this really true?



# Same Old Thing?



- Do you think Cloud is the “Same Old Thing retreaded?”
  - In some ways you’re right
  - But mostly you’re wrong



*Scientists from the RAND Corporation have created this model to illustrate how a “home computer” could look like in the year 2004. However the needed technology will not be economically feasible for the average home. Also the scientists readily admit that the computer will require not yet invented technology to actually work, but 50 years from now scientific progress is expected to solve these problems. With teletype interface and the Fortran language, the computer will be easy to use.*

# Cloud is Not Really New



- Ways in which the cloud is not really new
  1. Accessing data over communication lines has been normal for years
  2. Hosting data at off-premise sites has likewise been around for years
  3. Vendors providing hosted, pre-defined platforms are as old as H. Ross Perot's Service Bureau in 1962
  4. Vendors providing shared resources are as old as the Time-Sharing systems first introduced at Dartmouth in the 1960's





# Guess What? Cloud is More



- Not only is the cloud more-advanced than what's gone before, it has properties that have never-before been available
- So, what's changed to enable this? Today's communications systems are reliable (at least mostly), fast, and distributed; making cloud-based resources as performant as our own resources
- But, that's still not it



# Defining the Cloud



- To understand what makes the cloud “the cloud” NIST (U.S. National Institute of Science and Technology <http://www.nist.gov/itl/cloud/index.cfm>) has devoted some effort to defining it for us
- Here is the URL for a PDF document detailing NIST’s definition of cloud computing:  
<http://csrc.nist.gov/publications/nistpubs/800-145/SP800-145.pdf> .

# Five Characteristics of Cloud



- NIST defines five essential characteristics for cloud computing (paraphrased below):
  - On-demand self-service
  - Broad Network Access
  - Resource pooling
  - Rapid elasticity
  - Measured service
- These five traits are what are new (ish)

5



# On-Demand



- In the past provisioning of computing time, processors, and storage was based upon up-front estimates and contractually agreed to months or years in advance
- Self-Service nature of cloud allows customer to provision resources without human interaction with provider
- With cloud it's self-service and on-demand (pay as you go!)



# Broad Access



- In the past network access meant contracts with telephone/Internet providers
- Most cloud providers provide regional and often global ability to access resources
- Cloud providers use standard mechanisms



# Resource Pooling



- Resource pooling came along with the virtual computing wave a few years ago
- With the cloud, pooling is managed by the cloud provider to meet service level agreements
  - Provider resources are pooled
  - Multiple locations to improve performance and reduce dependencies (may be controlled)



# Rapid Elasticity



- Rapid elasticity is perhaps the most-obvious advantage of using the cloud;
  - If an organization needs to ramp up for a busy time of year (or influx of “big data”) a good cloud service will simply expand their memory and disk capacity as needed
  - When things slow down the cloud service can take the excess resources away
  - All automatically making sure you spend money only for resources you need when you need them



# Measured Service



- Measured service is again an area where we have experience already but with key differences
  - Cloud systems can measure use to control elasticity and pooling automatically
    - Allowing applications to have required resources to run
    - Making sure costs are in line with usage
  - Charges are for what you actually use  
(Note: Most vendor's provide discounts for up-front service commitments)



# Cloud Service Models



- Many, many acronyms come along with the cloud; here are three that are common
  - IaaS                      Infrastructure as a Service
  - PaaS                     Platform as a Service
  - SaaS                     Software as a Service



- Infrastructure as a Service means that the cloud provider gives you:
  - Hardware
  - Operations
  - Maybe core operating systems
- Does your organization really need to be in the Data Center Operations business?





- Platform as a Service means the provider is responsible for some core software load
  - Operating System
  - Backup & Recovery
  - Disaster Recovery
  - Maybe a database and/or web server
- Is the day-to-day administration of platform keeping you from work that is important and unique to your business?







- Software as a Service means that the provider has it all
  - Infrastructure
  - Platform
  - Software stack  
(e.g. SalesForce, Oracle Fusion)
- Huge portions of IT budgets are devoted to maintaining the existing code base; should your organization leverage the work of others so that you can focus on what is unique to your business?



# Comparing Models



On-Premise	IaaS	PaaS	SaaS
			Customizations
Applications	Applications	Applications	Applications
Data	Data	Data	Data
Runtime	Runtime	Runtime	Runtime
Middleware	Middleware	Middleware	Middleware
Operating System	Operating System	Operating System	Operating System
Virtualization	Virtualization	Virtualization	Virtualization
Servers	Servers	Servers	Servers
Storage	Storage	Storage	Storage
Networking	Networking	Networking	Networking

Customer Managed

Vendor Managed

# Services and Transport

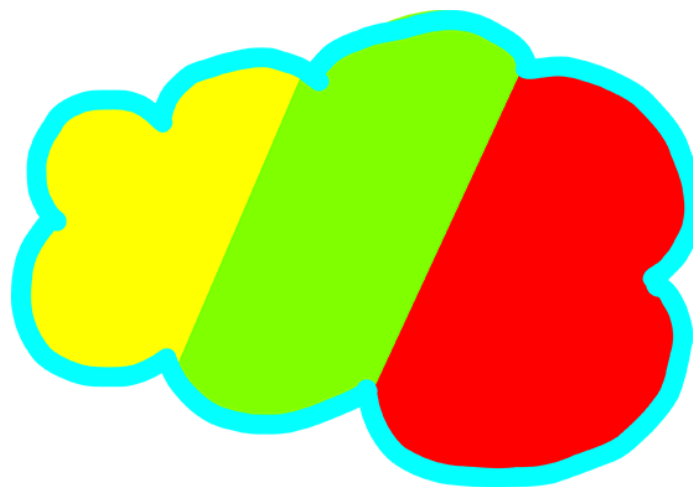


On-Premises	IaaS	PaaS	SaaS
Personal Car	Leased Car	Rented Car	City Tram/Train
<ul style="list-style-type: none"> <li>- Your car</li> <li>- You buy fuel</li> <li>- You provide maintenance</li> <li>- You choose direction of travel</li> <li>- You choose travel schedule</li> </ul>	<ul style="list-style-type: none"> <li>- Provider's car</li> <li>- You buy fuel</li> <li>- You provide maintenance</li> <li>- You choose direction of travel</li> <li>- You choose travel schedule</li> </ul>	<ul style="list-style-type: none"> <li>- Provider's car</li> <li>- Fuel might be provider option</li> <li>- Provider's maintenance</li> <li>- You choose direction of travel</li> <li>- You choose travel schedule</li> </ul>	<ul style="list-style-type: none"> <li>- Provider's vehicle</li> <li>- Provider's fuel</li> <li>- Provider's maintenance</li> <li>- Provider has fixed route</li> <li>- Provider has fixed schedule</li> </ul>

# Cloud Deployment



- Cloud offering offer deployment options
  - Public      You have private areas in public resource pools
  - Private      Your resources stored in private resource pools (perhaps on-premise)
  - Hybrid      Some combination



# Oracle and the Cloud



- In case you missed it <grin> Oracle's into the Cloud in a big way...

<https://cloud.oracle.com/home>

- SaaS Cloud Applications (formerly Fusion Applications) finally goes big?
- PaaS Reduces your administration load?
- IaaS Takes you out of data center biz?



- Oracle has exposed their applications stack as SaaS including:
  - Customer Experience
  - Human Capital Management (HCM)
  - Enterprise Resource Planning (ERP)
  - Supply Chain Management (SCM)
  - Enterprise Performance Management (EPM)
  - Analytics
  - Data
  - Social Media
  - More...

# Oracle PaaS



- Oracle is ready to provide infrastructure and management including:
  - Database and Big Data
  - Middleware, Integration, and SOA
  - Application Development (Java, Developer, etc.)
  - Content and Collaboration
  - Business Analytics
  - More...

# Oracle IaaS



- Oracle provides three families of IaaS:
  - Compute
  - Storage
  - Network
- Oracle announced at Open World 2016 that they intend to be a major player in IaaS and intend to surpass Amazon



# Oracle DBaaS



- Oracle DBaaS, A Real Cloud; Not Vapor



# Oracle's Strength



- Oracle has been king of the database hill for many years
- Now, they're extending that dominance to the cloud –  
Oracle DataBase as a Service (DBaaS)
- Dbaas uses the Platform as a Service (PaaS) model to enable deployment and management of Oracle database instances in the cloud

# How Oracle DBaaS Works



- Oracle's DataBase as a Service (DBaaS) is easy to use
- Instances use pre-configured VM images
- Built upon IaaS Compute & Storage services
- Customer has full administrative control
- Creation and deployment via wizards
- Works just like on-premise database
  - Any applications
  - Any connections control

# What Comes With DBaaS?



- RAC and Data Guard built-in
- ORDS built-in
- Oracle manages database for you
- Quarterly patching & upgrading
- Automated Backup
- Point In Time Recovery
- You can manage from command line, Enterprise Manager, or Oracle Management Cloud

# Creating a New Service



- Requires Oracle Cloud account with DBaaS
- Create Service is a wizard-based process

ORACLE® CLOUD My Services

Dashboard Users Notifications

Oracle Database Cloud Service

Services Activity SSH Access

Welcome! | REST APIs

Summary	1	1	7.5 GB	93 GB	1
	Services	OCPU	Memory	Storage	Public IPs

Services

Enter a full or partial service name

As of Aug 18, 2016 8:49:23 PM UTC

Create Service

# Subscription Type and Billing



- Create using wizards, manually, or via DBCA

ORACLE<sup>®</sup> CLOUD My Services peggy@kingtraining.com

Oracle Database Cloud Service  
**Create Service**

Cancel Service Details Confirm Next


**Service**  
Provide basic service instance information.


* Service Name	Demo122	?	* Service Level	Oracle Database Cloud Service	?
Description	Demo Oracle 12.2	?	* Metering Frequency	Hourly	?
			* Software Release	Oracle Database 12c Release 2	?
			* Software Edition	Standard Edition	?
			* Database Type	Single Instance	?



- Specify the database version & edition

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 Oracle Database Cloud Service  
**Create Service**

Service Details Confirm  

**Service**  
Provide basic service instance information.

\* Service Name  ? \* Service Level  ?

Description

\* Software Release

\* Software Edition

\* Database Type

Standard Edition  
✓ Enterprise Edition  
Enterprise Edition - High Performance  
Enterprise Edition - Extreme Performance

✓ Single Instance  
Database Clustering with RAC  
Single Instance with Data Guard Standby  
Database Clustering with RAC and Data Guard Standby

# Service Details (Configuration)



- Specify Service, Backup, and Configuration

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Oracle Database Cloud Service  
**Create Service**

Previous Cancel Next

Service **Details** Confirm

**Service Details**  
Provide details for this Oracle Database Cloud Service instance. Selection Summary

**Database Configuration**

\* DB Name (SID)  ?

\* PDB Name  ?

\* Compute Shape

\* SSH Public Key

**Settings**

✓ OC3 - 1.0 OCPU, 7.5 GB RAM  
OC4 - 2.0 OCPU, 15.0 GB RAM  
OC5 - 4.0 OCPU, 30.0 GB RAM  
OC6 - 8.0 OCPU, 60.0 GB RAM  
OC7 - 16.0 OCPU, 120.0 GB RAM  
OC1m - 1.0 OCPU, 15.0 GB RAM  
OC2m - 2.0 OCPU, 30.0 GB RAM  
OC3m - 4.0 OCPU, 60.0 GB RAM  
OC4m - 8.0 OCPU, 120.0 GB RAM  
OC5m - 16.0 OCPU, 240.0 GB RAM

**Backup and Recovery Configuration**

\* Backup Destination  ?

\* Cloud Storage Container  ?

\* Username

\* Password

Storage Container ☐ ?

Monthly Storage (GB)  ?

From Backup

Existing Backup  ?



# SSH Security



- Security is a major concern in today's world
- Oracle's DBaaS requires that you provide a valid SSH key to protect your resources

**Public key input for VM access** [X]

Select and then provide the values for either the VM Public Key, or the file that contains the VM Public Key contents.

☒ Key file name: mydbaaskey.pub **Update...** ?

☐ Key Value: [Text Area] ?

☐ Create a New Key ?

[Enter] [Cancel]

# Advanced Settings



- The Configuration page also has a button allowing you to get to “advanced” settings

▲ **Advanced Settings**

\* Listener Port  ?

\* Timezone  ▼

\* Character Set  ▼

\* National Character Set  ▼

Enable Oracle GoldenGate ☐ ?

Include "Demos" PDB ☐ ?

# Create Service Complete!



- DBaaS assigns IP address & connect string

Oracle Database Cloud Service / sedemo1

**Overview**

1 Node

**Administration**

0 Patches available

0 Snapshots available

**Summary**

1 Nodes	1 OCPUs	7.5 GB Memory	150 GB Storage
---------	---------	---------------	----------------

**Nodes** As of Aug 18, 2016 9:44:06 PM UTC

<b>sedemo1</b> Public IP: 129.144.15.167	SQL *Net Port: 1521 SID: ORCL PDB Name: PDB1	OCPUs: 1 Memory: 7.5 GB Storage: 150 GB
---	--	---

**Additional Information**

Identity Domain:	uskingtrai
Edition:	Standard Edition
Service Level:	Oracle Database Cloud Service
Subscription Type:	Monthly
Connect String:	sedemo1:1521/PDB1.uskingtrai.oraclecloud.internal
Created On:	Aug 18, 2016 9:15:56 PM UTC
Created By:	john@kingtraining.com
Container Name:	ORCL
Backup Destination:	None
Timezone:	Coordinated Universal Time
Character Set:	AL32UTF8 - Unicode Universal character set UTF-8 form 32-bit
National Character Set:	AL16UTF16 - Unicode UTF-16 Universal character set
Location:	US006_Z23

[show less](#)

**Activity**

Activity Summary	
<b>Create Service Completed</b>	Start Time: Aug 18, 2016 9:15:56 PM UTC End Time: Aug 18, 2016 9:38:54 PM UTC

# Using DBaaS



- Once created both CDB and PDBs may be accessed in normal ways
  - Best option is to connect using SSH; providing a more-secure connection
  - By default direct listener access (port 1521 usually) is disabled, if enabled access string is exactly as with non-cloud instances
- Connections to CDB will use SID
- Connections to PDB(s) will use Service Name(s)

# Getting Connection Info



- Connect information is found on Dashboard

**ORACLE® CLOUD My Services**

peggy@kingtraining.com

Dashboard Users Notifications

Oracle Database Cloud Service / Demo122

**Service Overview** As of Mar 20, 2017 12:46:12 AM UTC

1 Node 1 OCPUs 7.5 GB Memory 150 GB Storage

Status: Ready  
 Connect String: Demo122:1521/PDB1.a418478...  
 Edition: Standard Edition  
 Backup Destination: None  
 PDB Name: PDB1 Container Name: ORCL  
 Character Set: AL32UTF8 - Unicode Univer... National Character Set: AL16UTF16 - Unicode UTF-1...  
 SQL \*Net Port: 1521 Timezone: Coordinated Universal Time

Show less...

**Resources**


Host Name: Demo122  
 Public IP: 129.144.50.88  
 SID: ORCL




OCPUs: 1  
 Memory: 7.5 GB  
 Storage: 150 GB


41



- By default, only SSH access allowed


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 Dashboard
  Users
  Notifications


 Oracle Database Cloud Service / Demo122 / Access Rules

### Access Rules

You can use access rules to control network access to service components. On this page, you can manage your access rules.

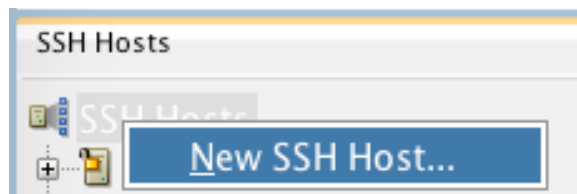
Results per page:  9 result(s) as of Mar 20, 2017 12:48:19 AM UTC

Status	Rule Name	Source	Destination	Ports	Protocol	Description	Rule Type	Actions
	ora_p2_ssh	PUBLIC-INTERNET	DB	22	TCP		DEFAULT	
	ora_p2_http	PUBLIC-INTERNET	DB	80	TCP		DEFAULT	
	ora_p2_https	PUBLIC-INTERNET	DB	443	TCP		DEFAULT	
	ora_p2_httpadmin	PUBLIC-INTERNET	DB	4848	TCP		DEFAULT	
	ora_p2_dbconsole	PUBLIC-INTERNET	DB	1158	TCP		DEFAULT	
	ora_p2_dbexpress	PUBLIC-INTERNET	DB	5500	TCP		DEFAULT	
	ora_p2_dblistener	PUBLIC-INTERNET	DB	1521	TCP		DEFAULT	
	sys_infra2db_ssh	PAAS-INFRA	DB	22	TCP	DO NOT MODIFY: Permit P...	SYSTEM	
	ora_trusted_hosts_dbli...	127.0.0.1/32	DB	1521	TCP	DO NOT MODIFY: A secur...	SYSTEM	

# Connecting Via SSH, 1



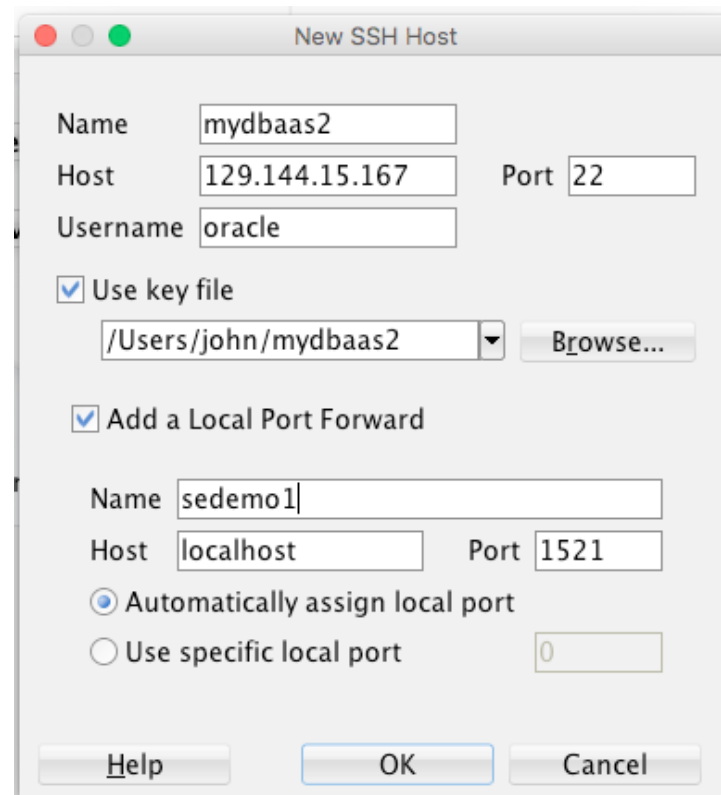
- To connect to a database via SSH (e.g. DBaaS instance) you first define the SSH Host
- From SSH View (View->SSH from the SQL Developer menu)
  - Right-click and choose “New SSH Host”



# Connecting Via SSH, 2



- Use information from instance to define a new SSH Host
  - Name: your choice
  - Host: IP address / domain\_url
  - Port: 22
  - Username: oracle
  - Check “Use key file” and browse to the private key file matching the database public key file
  - Check “Add a Local Port Forward” and pick name, host, and port
  - Click “OK” when done





# Connecting Via SSH, 3



- Create connection; specify a username/password; choose Connection Type “SSH” and specify the Port Forward name from the previous step; Use the database’s SID (CDB) or Service Name (PDB)

New / Select Database Connection

Connection...	Connection...
12c linux a...	app_schem...
12c linux ct...	ctxsys@//1...
12c linux e...	ebr_admin...
12c linux e...	ebr_dba@/...
12c linux e...	ebr_dev@/...
12c linux e...	ebr_schem...
12c linux e...	ebr_user@/...
12c linux jo...	john@//19...
12c linux js...	jsonuser@/...
12c linux sh	sh@//192...
12c linux sys	sys@//192...
12c linux s...	sys@//192...
12c linux s...	system@/...
12c linux2 ...	app_schem...
12c linux2 ...	BISOURCE@...
12c linux2 ...	BITARGET@...
12c linux2 ...	ebr_admin...
12c linux2 ...	ebr_user@/...
12c linux2 i...	john@//19...

Status : Success

Connection Name: Oracle DBAAS myorcl system

Username: system

Password: .....

☒ Save Password ☐ Connection Color

Oracle

Connection Type: SSH Role: default

Port Forward: sedemo1 (mydbaas2)

☒ SID: ORCL

☐ Service name

☐ OS Authentication ☐ Kerberos Authentication

# Enabling Other Connections



- You may enable a “normal” listener-style TNS-type connection

	ora_p2_dblistener	PUBLIC-INTERNET	DB	1521	TCP		DEFAULT	Enable	
	sys_infra2db_ssh	PAAS-INFRA	DB	22	TCP	DO NOT MODIFY: Permit P...	SYSTEM	Disable	
	ora_trusted_hosts_dbli...	127.0.0.1/32	DB	1521	TCP	DO NOT MODIFY: A securul...	SYSTEM	Delete	

- Make sure your security people are ok with this! – Not the best idea...**

	ora_p2_dblistener	PUBLIC-INTERNET	DB	1521	TCP		DEFAULT	
--	-------------------	-----------------	----	------	-----	--	---------	--



- Use SID for CDB, Service Name for PDB

New / Select Database Connection

Connection...	Connection...
12c linux a...	app_schem...
12c linux ct...	ctxsys@//1...
12c linux e...	ebr_admin...
12c linux e...	ebr_dba@/...
12c linux e...	ebr_dev@/...
12c linux e...	ebr_schem...
12c linux e...	ebr_user@/...
12c linux jo...	john@//19...
12c linux js...	jsonuser@/...
12c linux sys...	sys@//192...
12c linux s...	sys@//192...
12c linux s...	system@/...
12c linux2 ...	app_schem...
12c linux2 ...	BISOURCE@...
12c linux2 ...	BITARGET@...
12c linux2 ...	ebr_admin...
12c linux2 ...	ebr_user@/...
12c linux2 j...	john@//19...
12c linux2 ...	svstem@/...

Connection Name: 12c linux john

Username: john

Password: ....

☒ Save Password

**Oracle**

Connection Type: Basic Role: default

Hostname: 192.168.0.61

Port: 1539

☐ SID

☒ Service name: pdb1.localdomain

☐ OS Authentication ☐ Kerberos Authentication

Status :

# What About Security?



- Really?
- What's your organization's budget for security?
- What do you suppose the security budget is at Oracle ? (or Amazon or Microsoft...)
- If cloud providers slip once; public embarrassment and exit of customers follows
- Your data is probably safer in the cloud



# Some Things To Consider

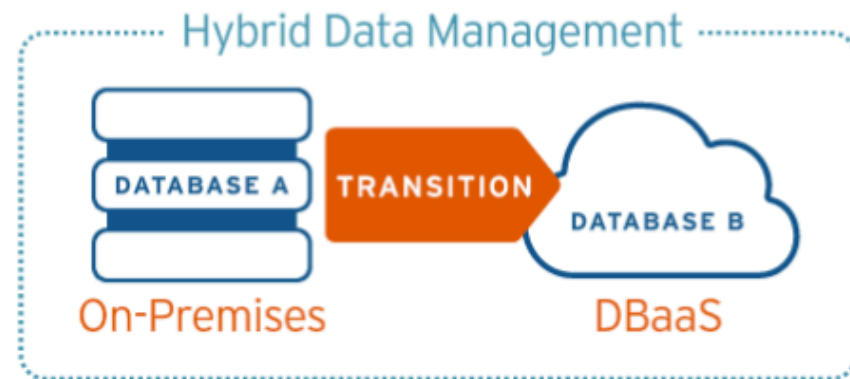
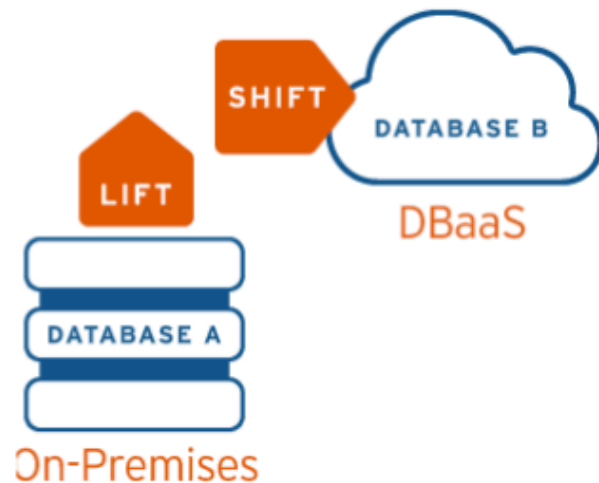


- Security of data in Public Cloud and off-premise Private/Hybrid Cloud environments
- Segregation of “secure” data
  - Normal processing
  - Backup/Recovery
  - Disaster Recovery
- Guaranteed wiping of data should you part ways with vendor (might be tough)
- Responsibility for regulated data lies with customer, not vendor

# Lift-and-Shift vs Hybrid



- DBaaS strategies choices include “lift and shift” vs hybrid of on-premise and DBaaS



# Trends Pushing DBaaS

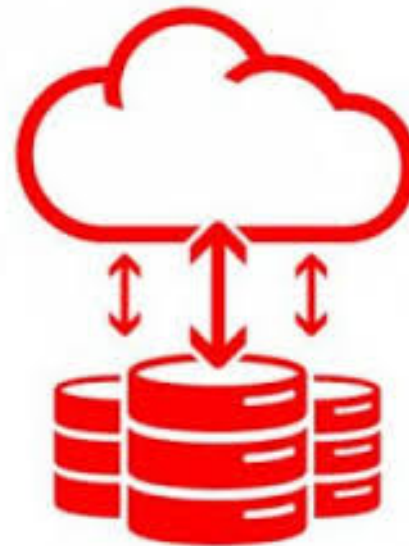


- Database Sprawl
- Infrastructure Growth
- Drive towards Self Service Technology
- Virtualization
- Data driving business decisions
- Need to scale in cost-effective way

# What's In It for Me?



- Some potential use-cases for DBaaS today include
  - Temporary database creation for testing
  - Cloning for Disaster Recovery
  - Ability to experiment with new patches and releases
  - Training





# Wrapping it all Up



- Cloud is everywhere, cloud is here to stay
- Oracle's DBaaS provides a safe and simple way to use the cloud



# RMOUG Training Days 2018

February 20-22, 2018 (Tuesday-Thursday)

Westin Hotel

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Westminster, CO 80020



## Tracks

- Application Development
- Business Intelligence
- Database Administration
- DBA Deep Dive
- Database Tools of the Trade
- Hyperion
- Middleware
- Professional Empowerment

PHOTO CREDIT: Mike Landrum, SQL Developer and the "Data Tsunami" from i-Behavior

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ODTUG  
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*Kscope 2018 in Orlando!*



## *DBaaS: Taking Advantage of Oracle Cloud Database*

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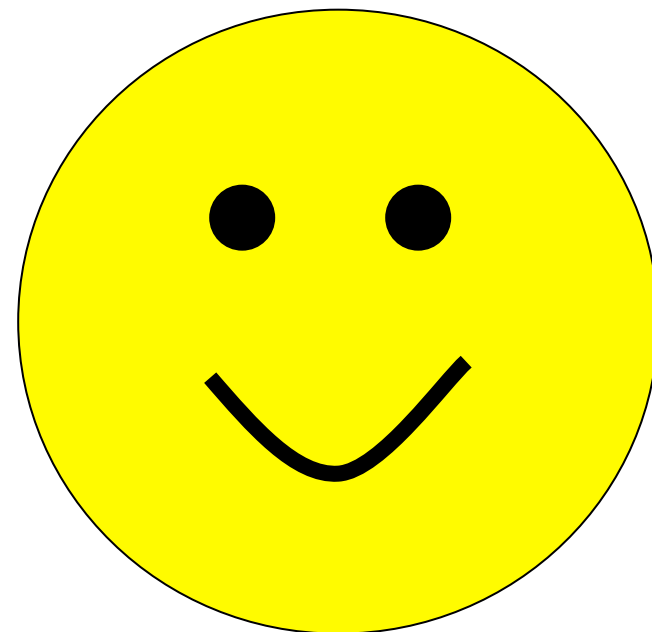
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**Thanks for your attention!**

Today's slides and examples are on the web:

**<http://www.kingtraining.com>**



- End