DBaaS:
Taking Advantage of Oracle Cloud Database

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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

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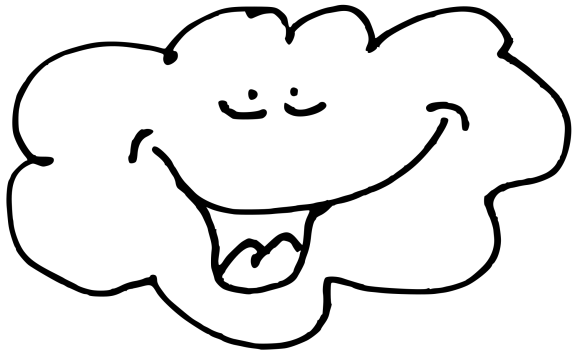
Arizona, USA

Who Are You?

- Application Developer
- DBA
- Business Analyst
- Other?

The Cloud Is Upon Us!

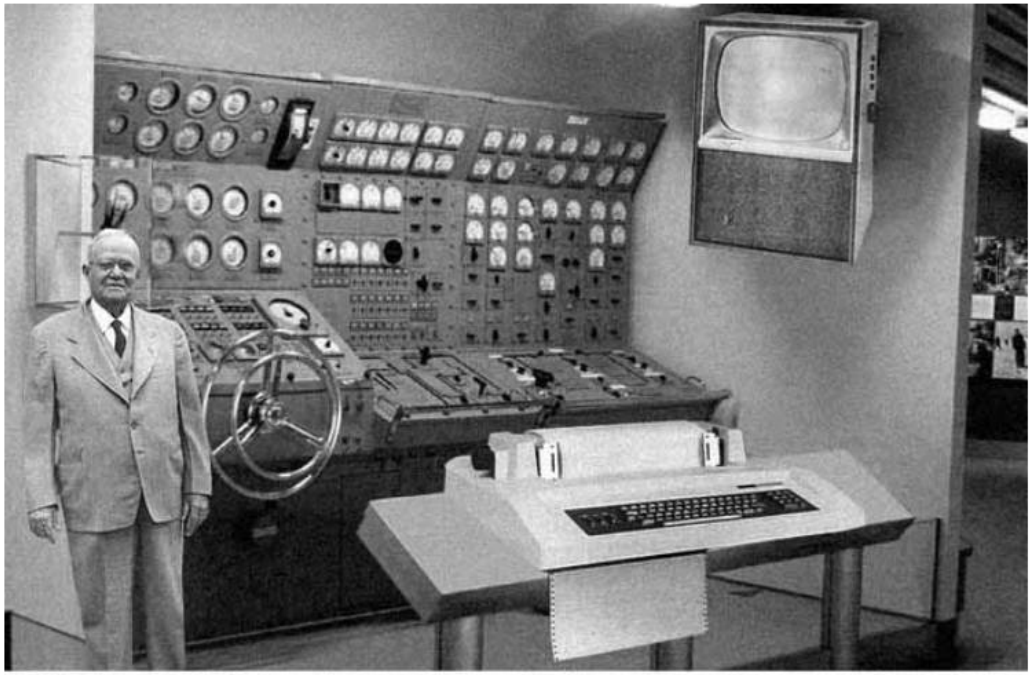
- Everywhere you turn vendors are offering cloud solutions promising (once-again) a single solution to solve the ills of our IT organizations.



- Bah! Some naysayers say “this is just the same-old, same-old, we’ve been doing the cloud for years”
  – hmmmm 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

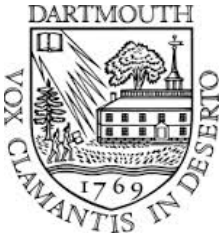


Scientists from the RAND Corporation have created this model to illustrate how a "home computer" could look like in the year 2004. However the needed technology will not be economically feasible for the average home. Also the scientists readily admit that the computer will require not yet invented technology 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

IaaS

- 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?

PaaS

- 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?

SaaS

- 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

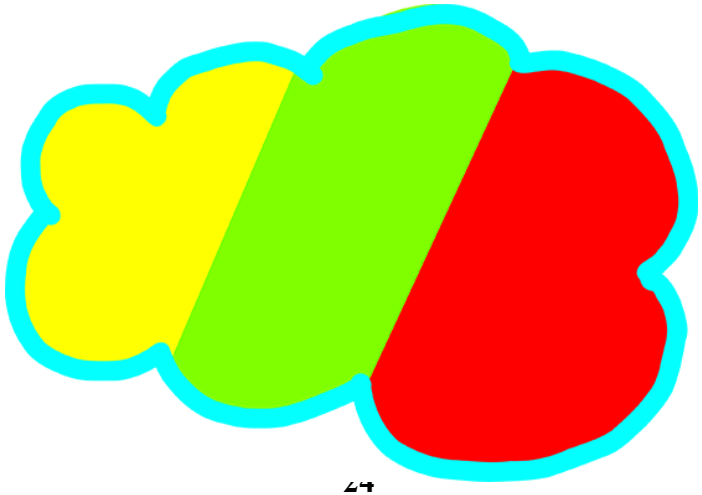
Customer Managed	Vendor Managed

Services and Transport

On-Premises	IaaS	PaaS	SaaS
Personal Car	Leased Car	Rented Car	City Tram/Train
- Your car - You buy fuel - You provide maintenance - You choose direction of travel - You choose travel schedule	- Provider's car - You buy fuel - You provide maintenance - You choose direction of travel - You choose travel schedule	- Provider's car - Fuel might be provider option - Provider's maintenance - You choose direction of travel - You choose travel schedule	- Provider's vehicle - Provider's fuel - Provider's maintenance - Provider has fixed route - Provider has fixed schedule

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 SaaS

- 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

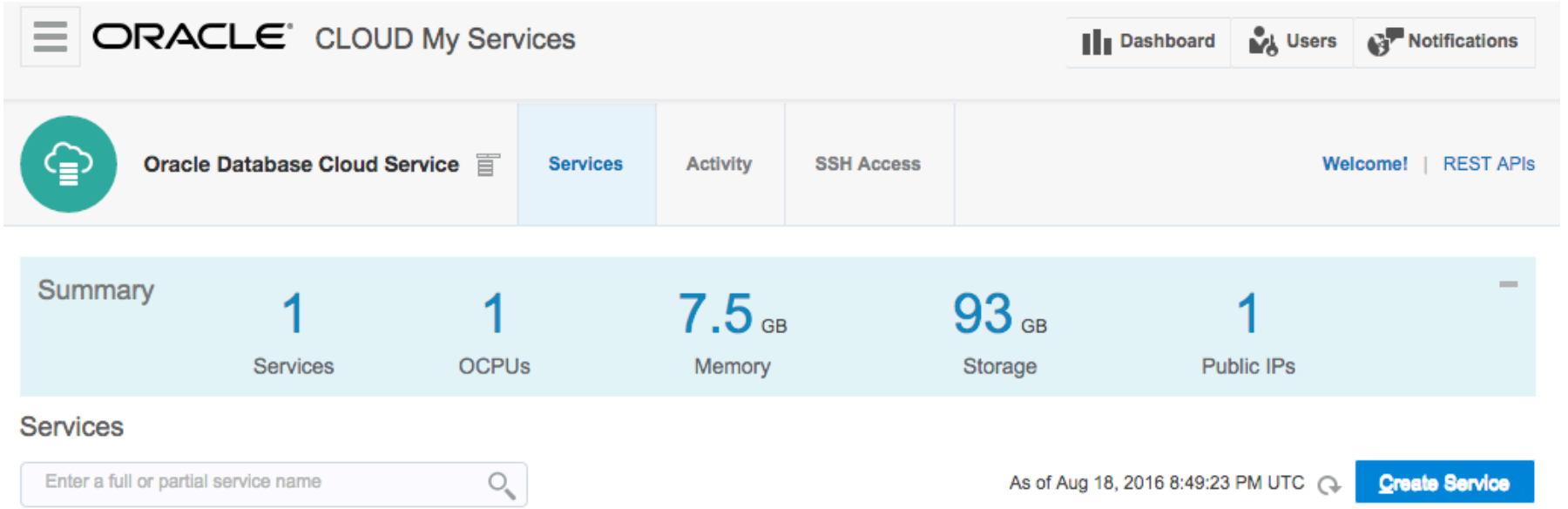
- Oracle's DataBase as a Service (DBaaS) is easy to use
- Instances use pre-configured VM images
- Built upon IaaS Compute & Storage services
- Customer has full administrative control
- Creation and deployment via wizards
- Works just like on-premise database
  - Any applications
  - Any connections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

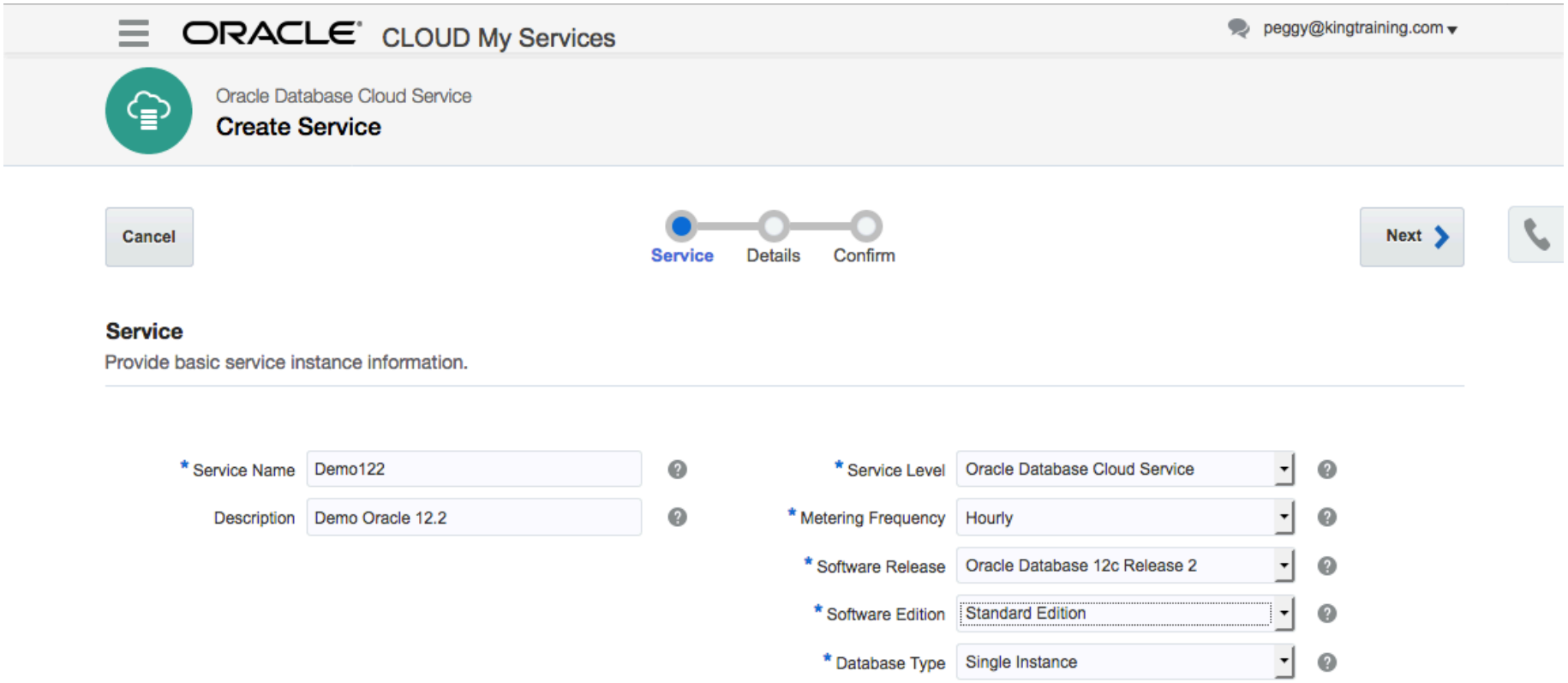
Creating a New Service

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



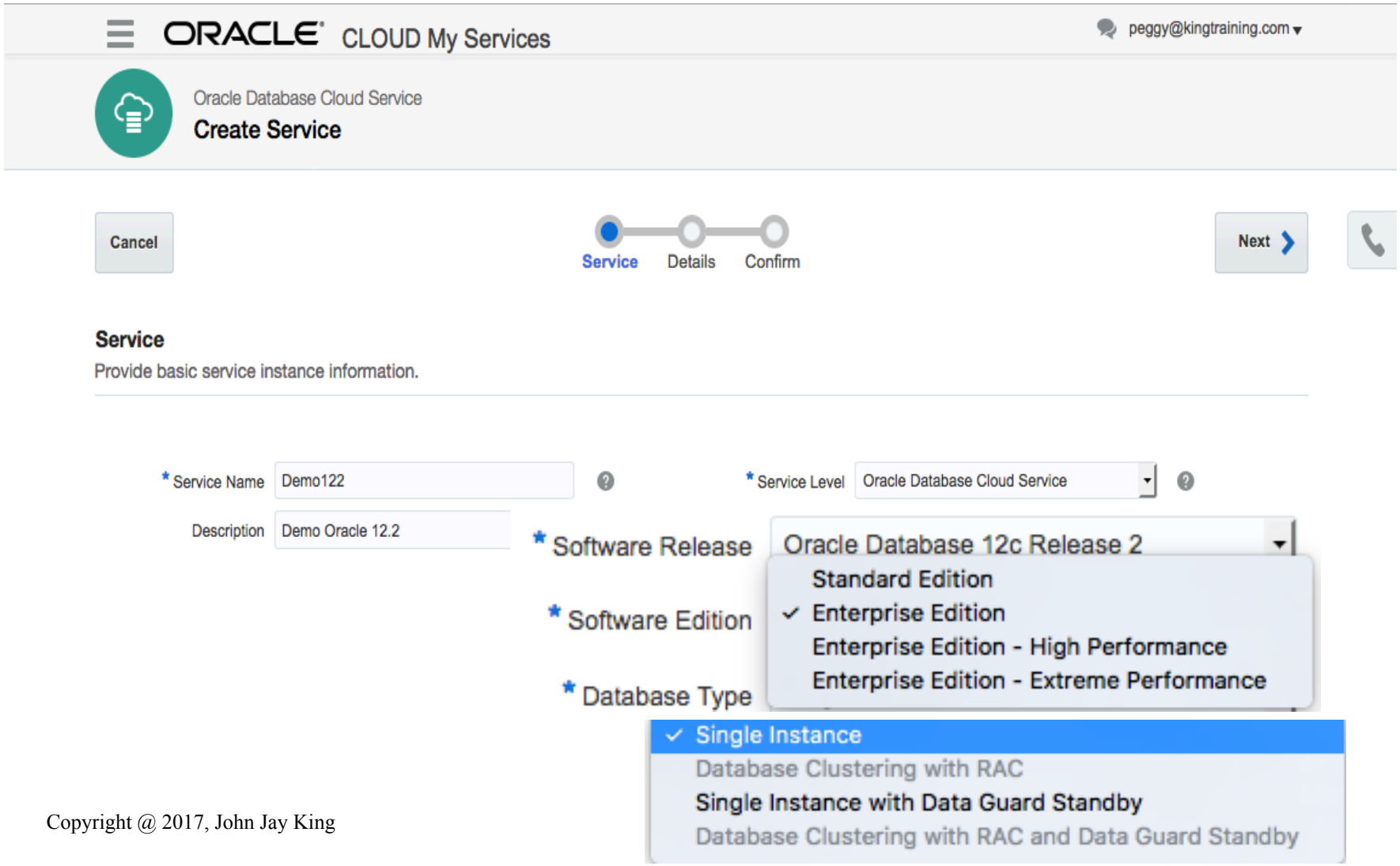
Subscription Type and Billing

- Create using wizards, manually, or via DBCA



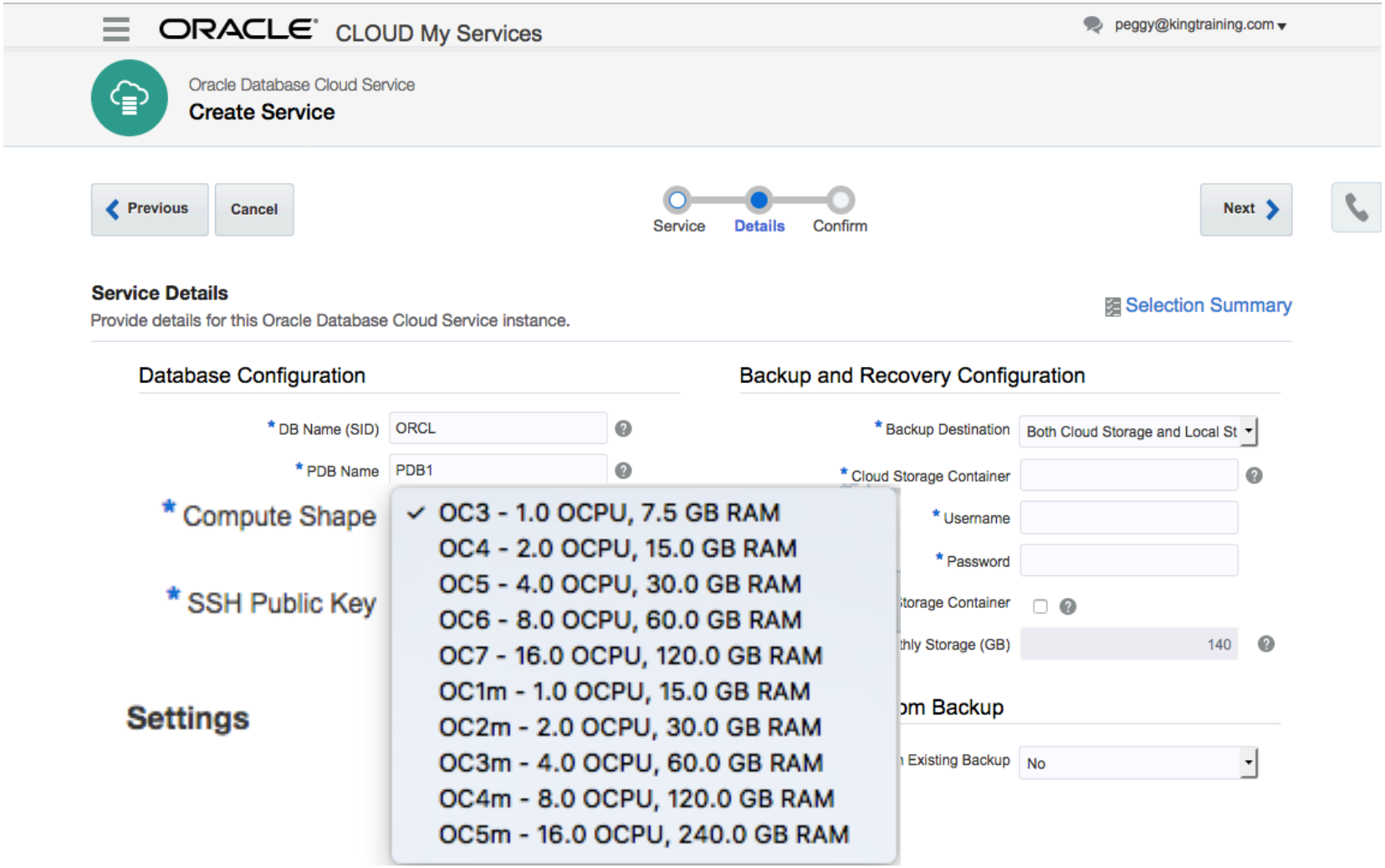
Software Release

- Specify the database version & edition



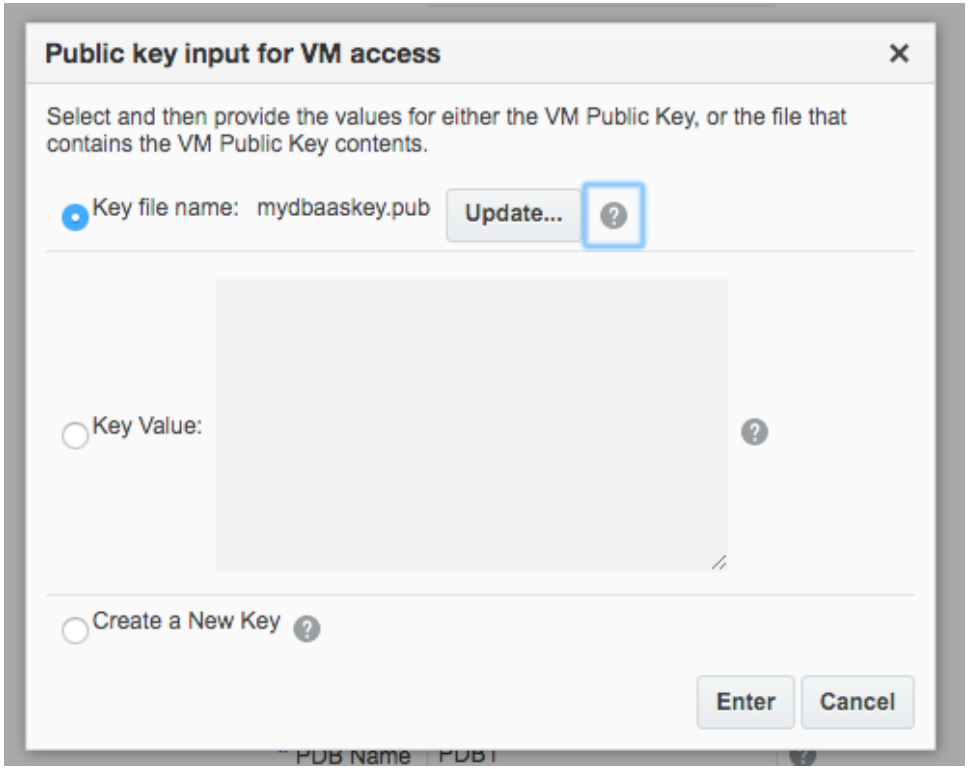
Service Details (Configuration)

- Specify Service, Backup, and Configuration



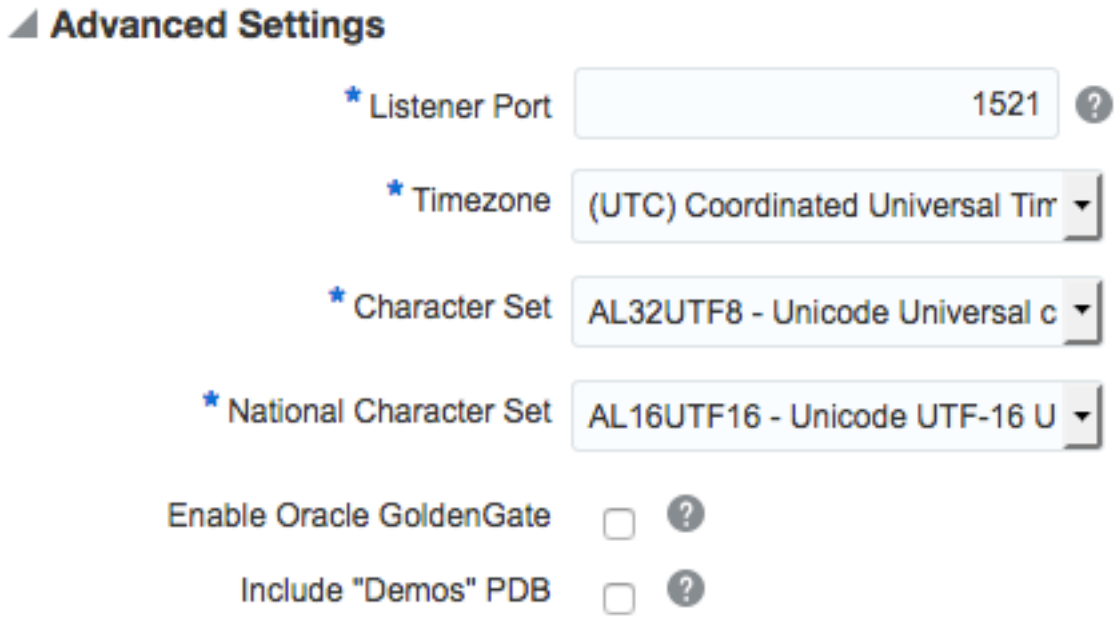
SSH Security

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



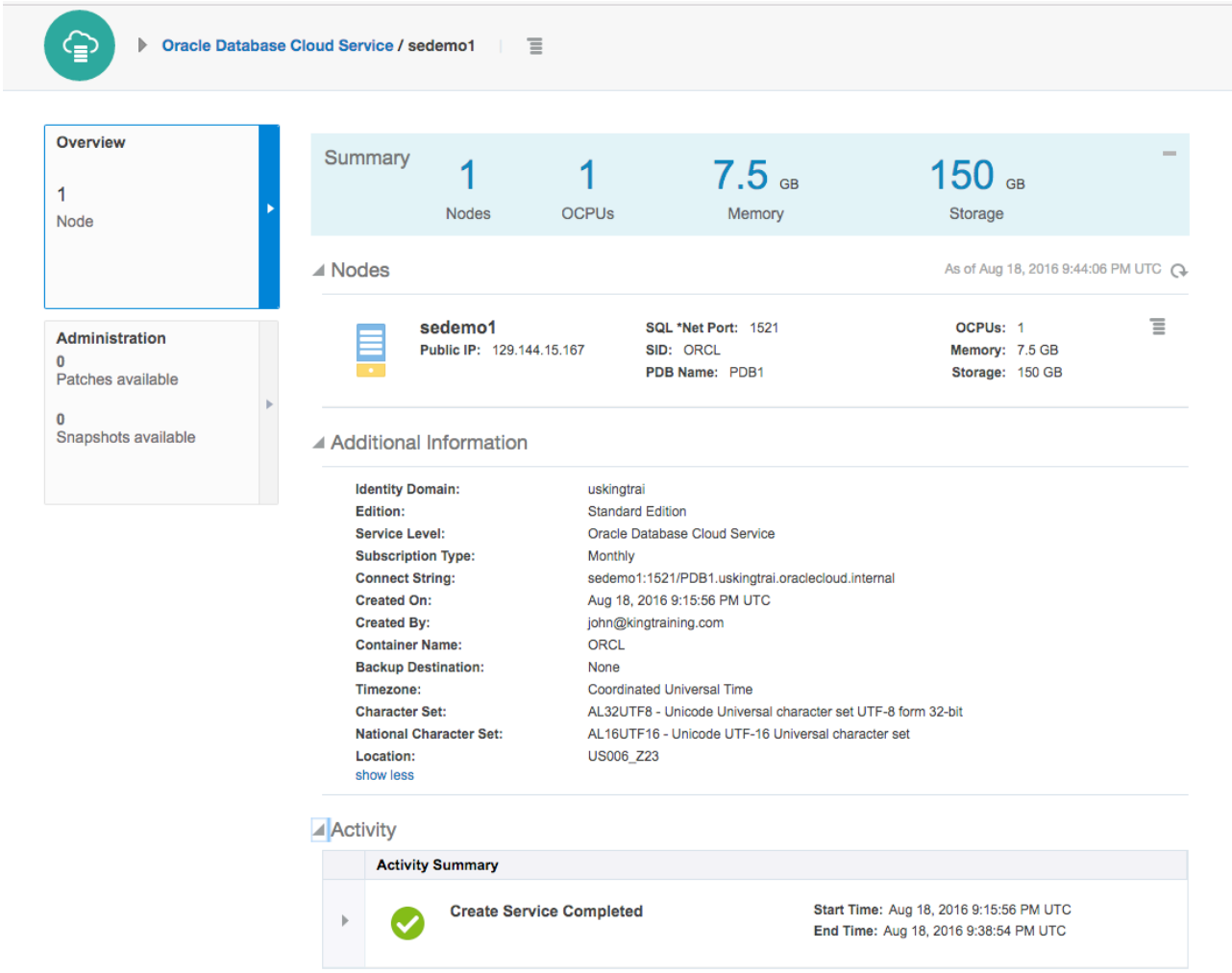
Advanced Settings

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



Create Service Complete!

- DBaaS assigns IP address & connect string

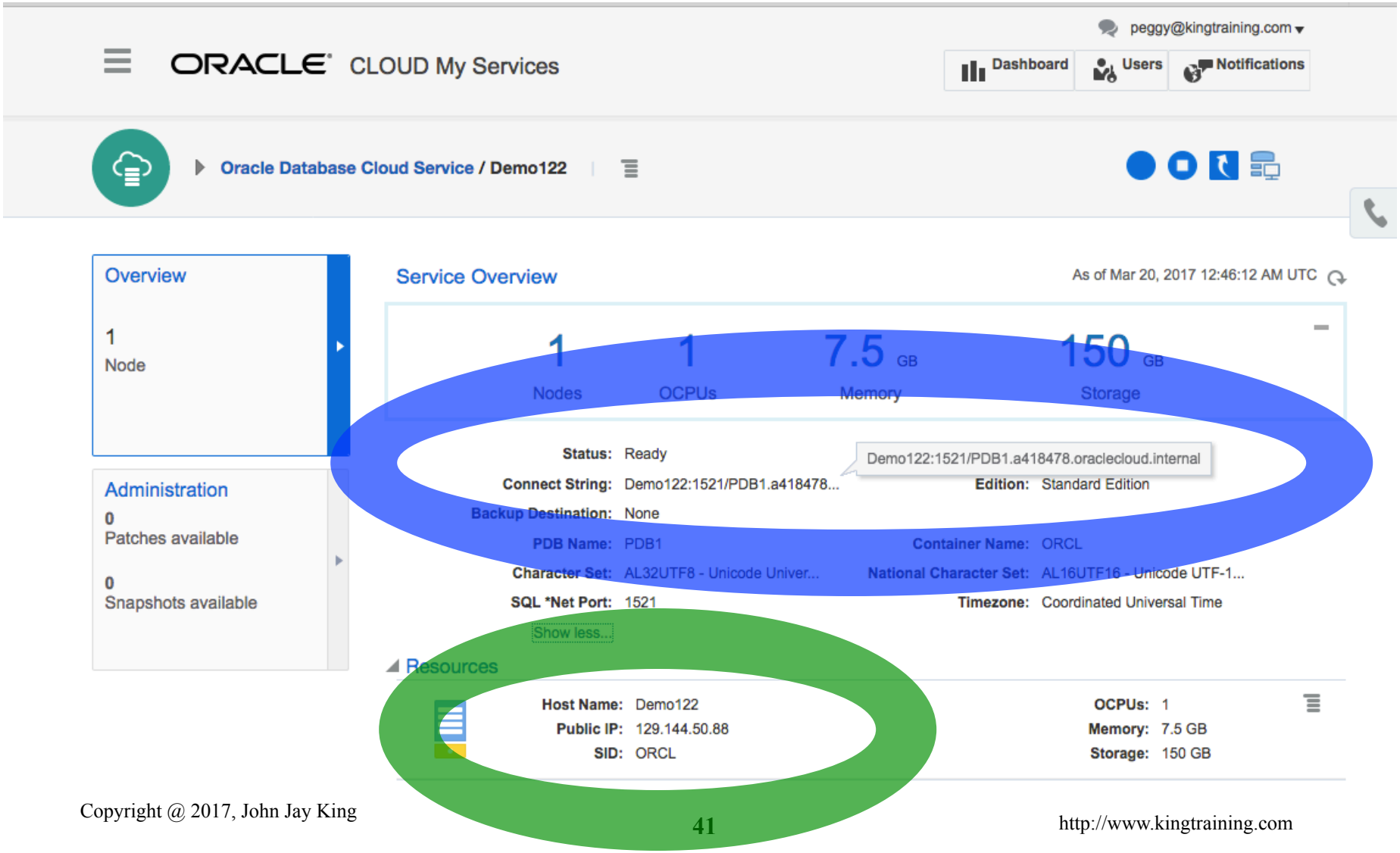


Using DBaaS

- 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)

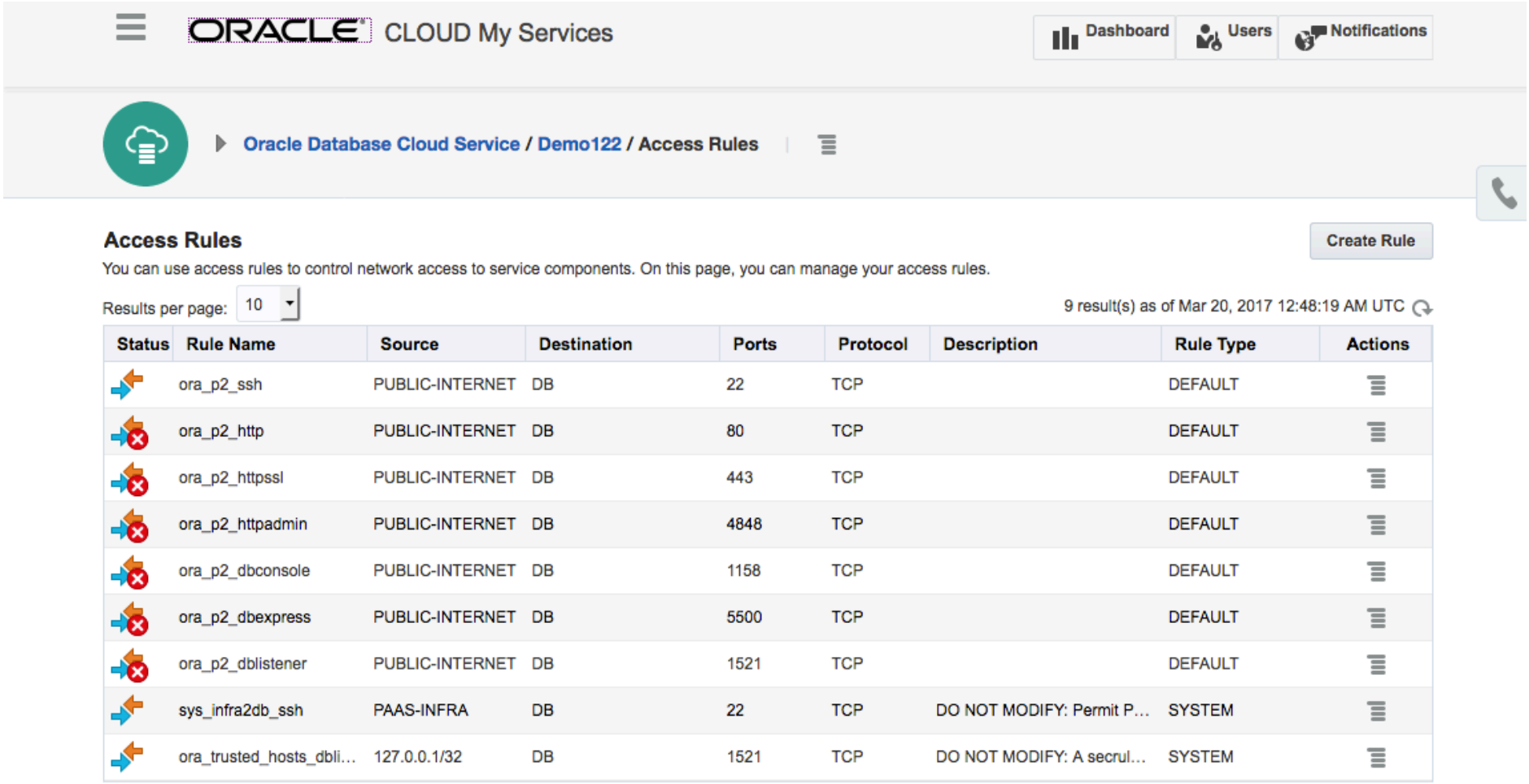
Getting Connection Info

- Connect information is found on Dashboard



Default Security

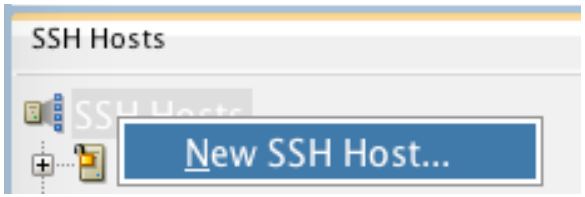
- By default, only SSH access allowed



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_httpssl	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 secrul…	SYSTEM	

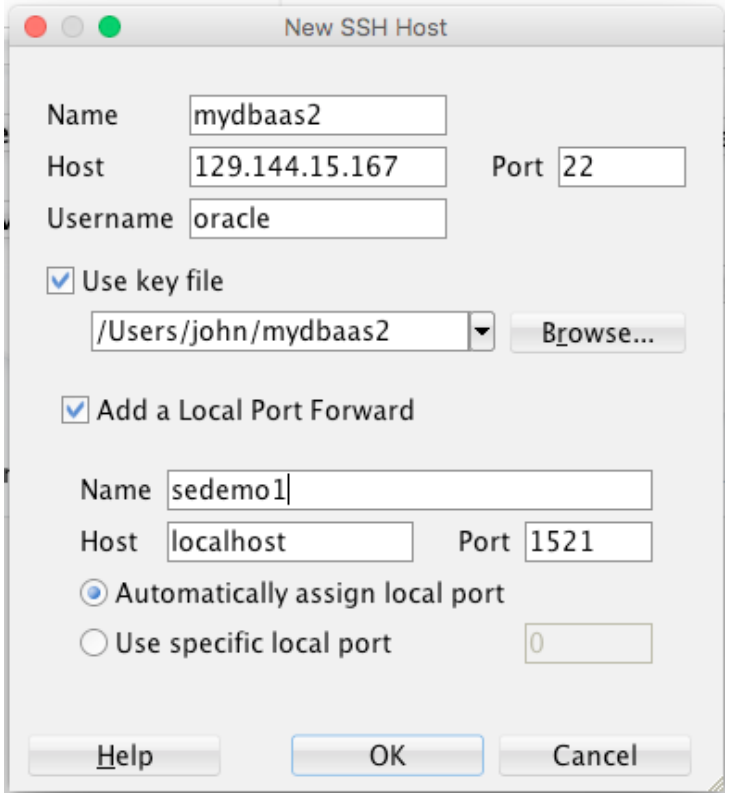
Connecting Via SSH, 1

- 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”



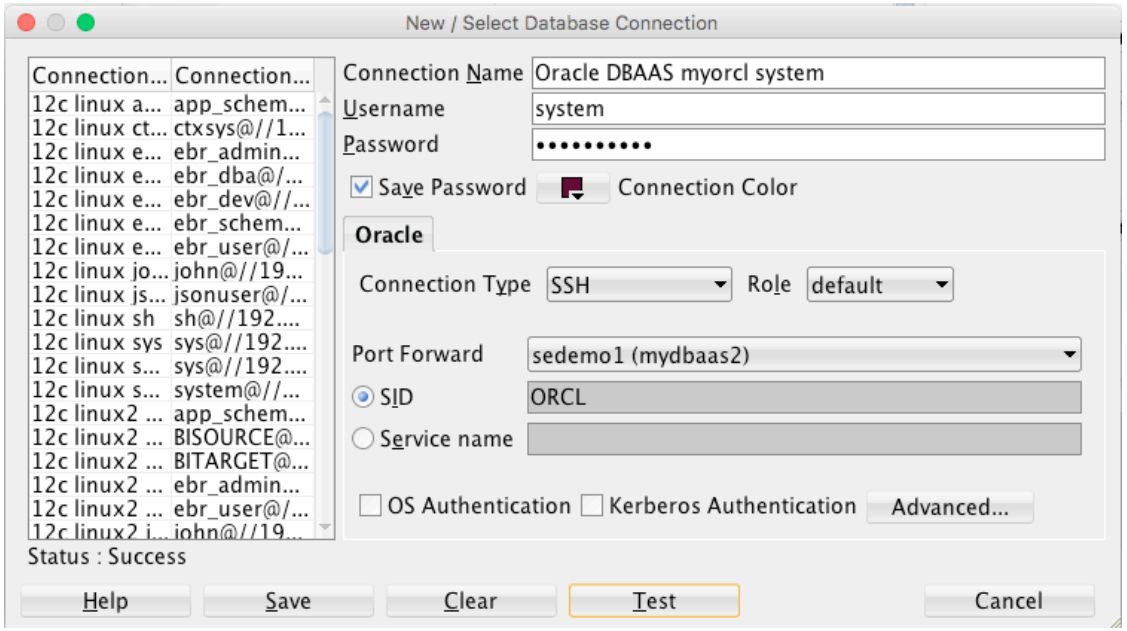
Connecting Via SSH, 2

- 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

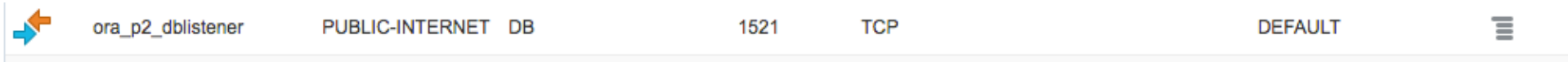
- Create connection; specify a username/ password; choose Connection Type “SSH” and specify the Port Forward name from the previous step; Use the database’s SID (CDB) or Service Name (PDB)



Enabling Other Connections

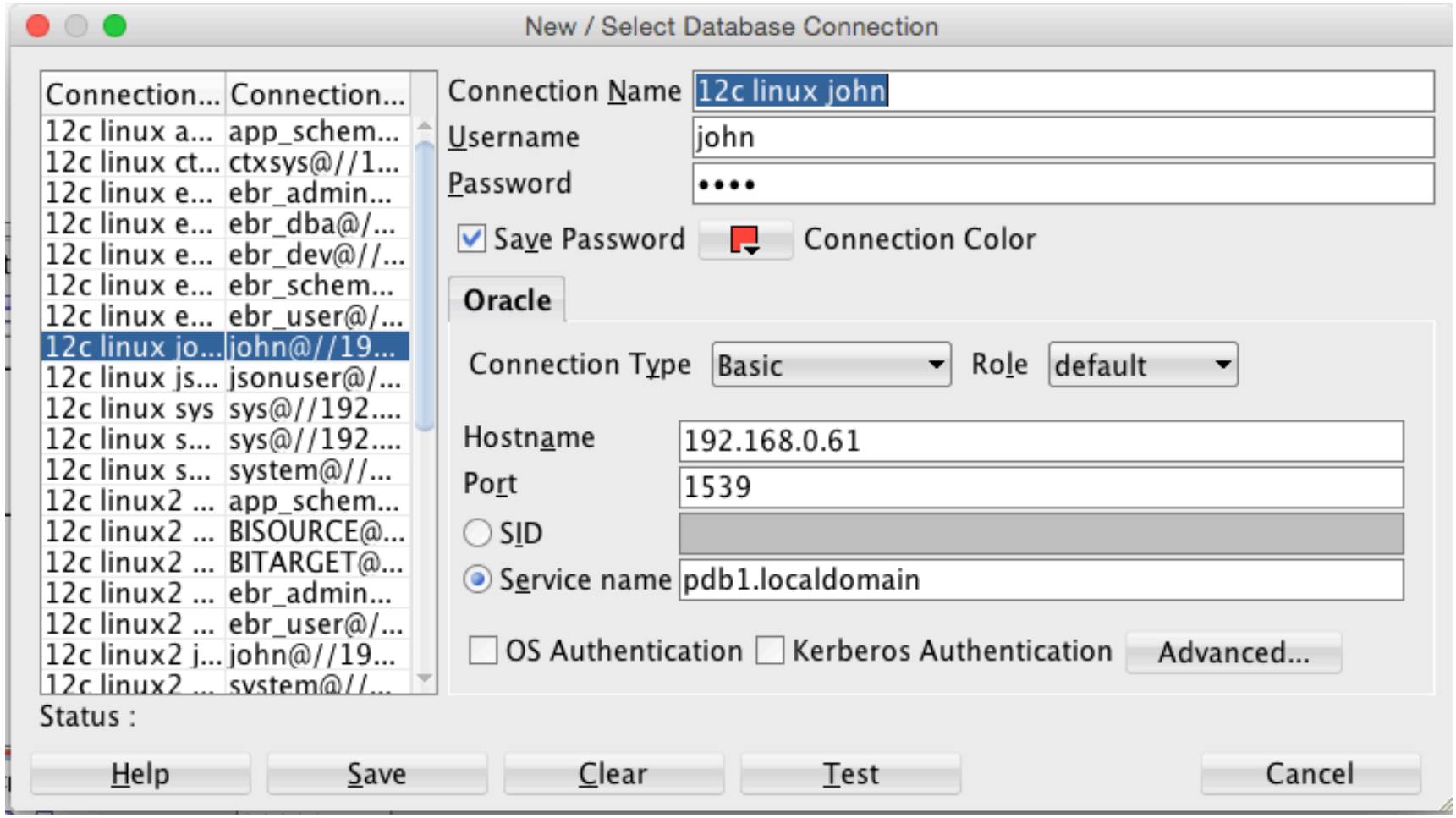
- You may enable a “normal” listener-style TNS-type connection

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



Non-SSH Connections

- Use SID for CDB, Service Name for PDB



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...)

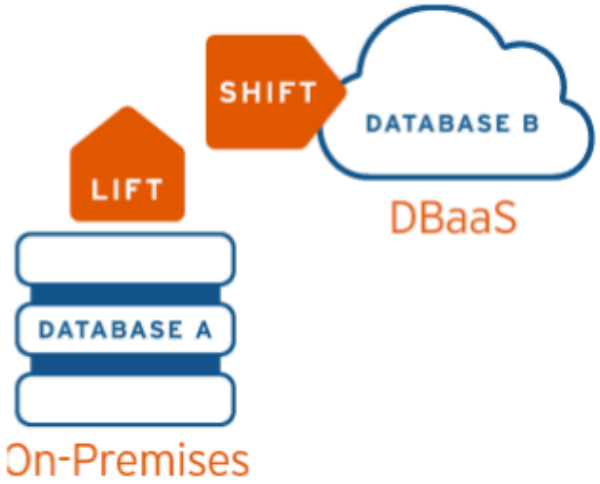
- If cloud providers slip once; public embarrassment and exit of customers follows
- Your data is probably safer in the cloud

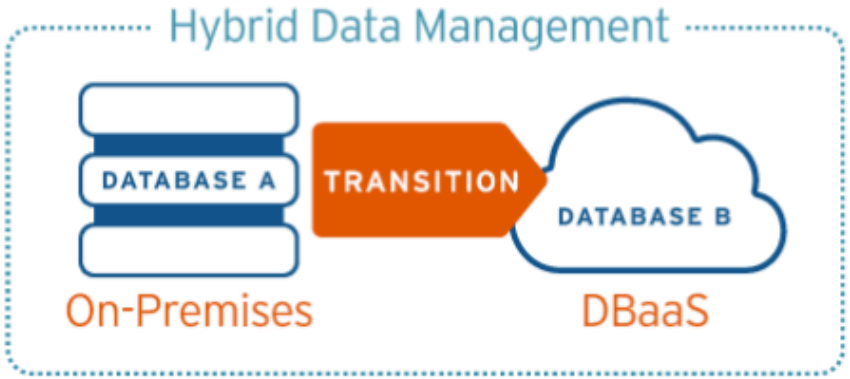
Some Things To Consider

- 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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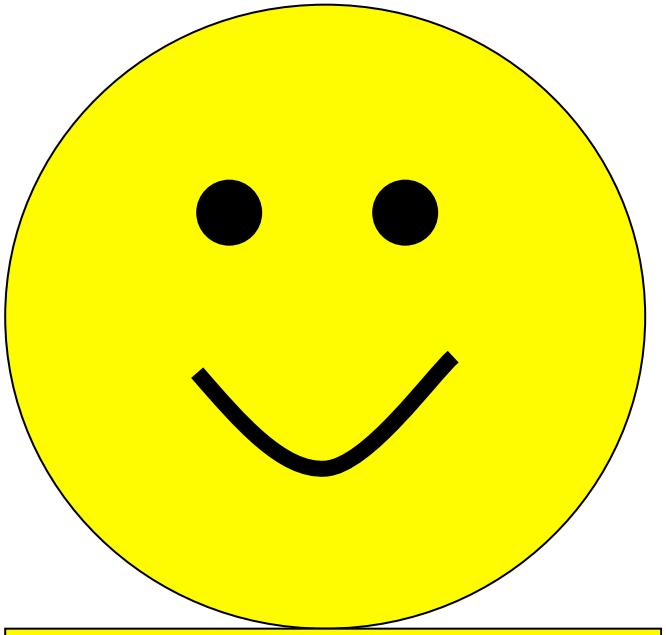

Thanks for your attention!

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