kindred

Automating Oracle database administration, practical examples with Ansible

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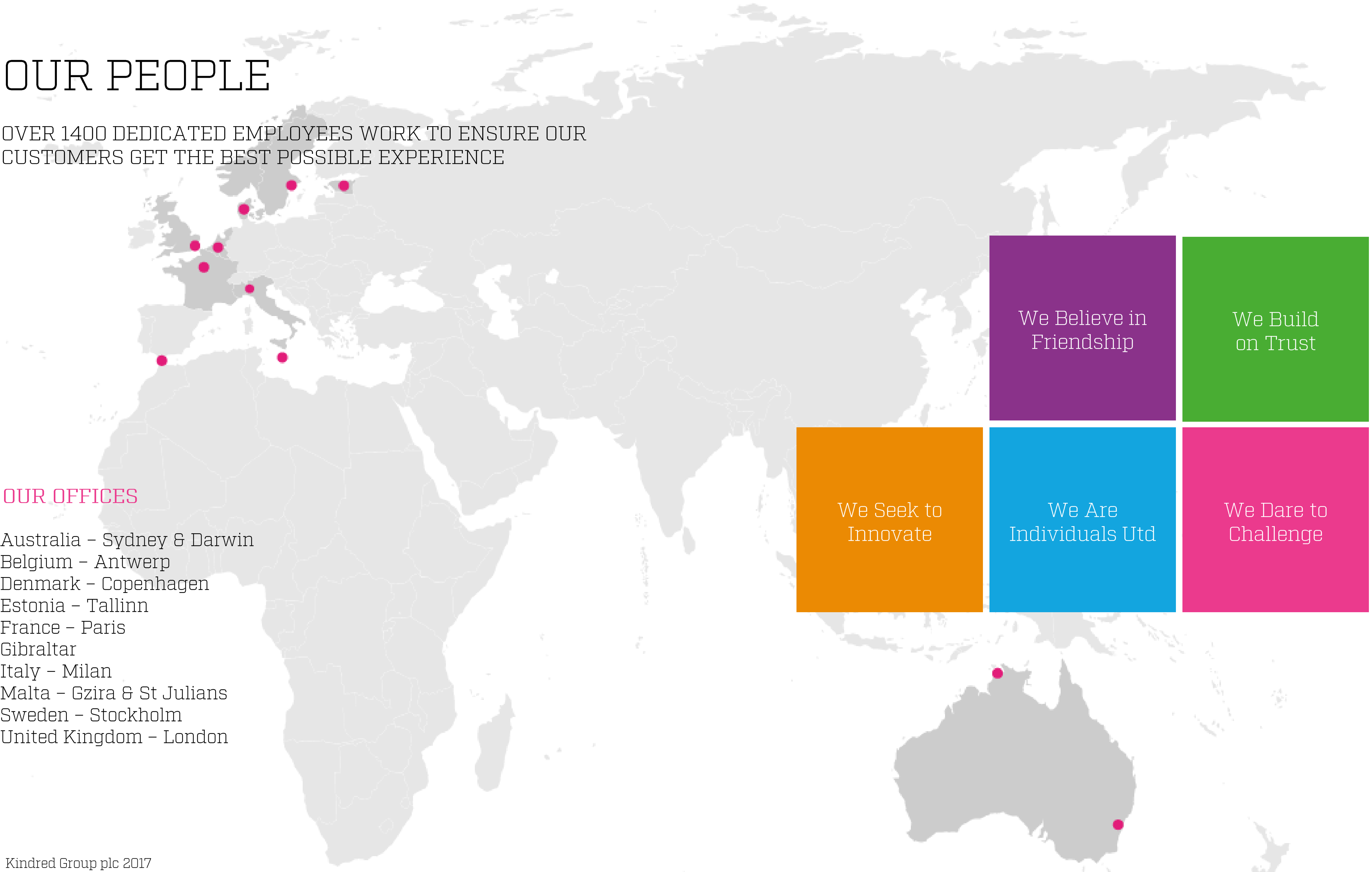

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WHOAMI: Ilmar Kerm

- Senior database administrator in Kindred Group
- Working in IT since 2000
- Working with Oracle database since 2003
- Working in Kindred since 2007/2015
- From LAMP developer to Oracle DBA
- President of Oracle User Group Estonia
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(… introducing… Mikael)

- The Northern King

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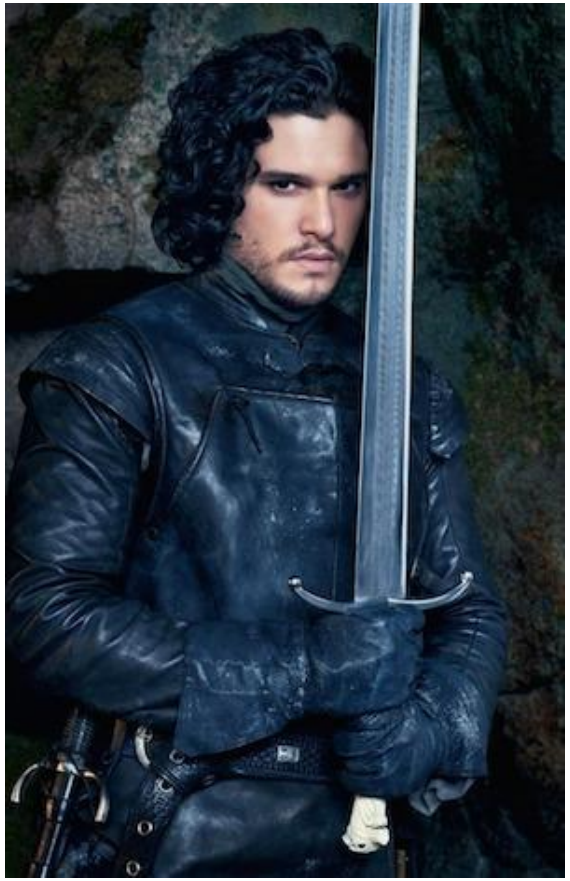

WHOAMI: Mikael Sandström

- Senior database administrator at Kindred Group
- Worked with Oracle for a long time
- Working at Kindred since early 2016
- First time presenting at a conference
- Automation junkie

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Agenda

- We expect that you are familiar with Ansible
- We only show you demos about practical/routine Oracle DBA tasks
- Things we cover
  - Setting up Ansible environment for Oracle DB use: inventory, modules, cxOracle
  - Creating/managing users and roles, syncing with Active Directory
  - Services, tablespaces, resource manager, DBMS_SCHEDULER, AWR settings, INIT.ORA parameters, ASM diskgroups
  - User privileges, including grants to entire target schema
  - Gathering facts about databases
  - Managing passwords in playbooks
  - Practical playbook deployment: execution, scheduling, configuration
  - Show GoldenGate assisted near zero downtime DB upgrade playbook
- Things we do not cover, because every other Ansible presentation does these
  - What is Ansible (check the first bullet point)
  - Managing OS
  - Installing Oracle RDBMS/Grid software
  - Creating databases/clusters (we will create PDBs though)

Setting up

- Clone the modules and put them in a directory called 'library'

  ```
  git clone https://github.com/oravirt/ansible-oracle-modules library
  ```

- Install cx_Oracle
  - Needed where the modules are executed
  - cx_Oracle needs an Oracle client
  - If run locally on 'control-machine' instant client is fine, otherwise just install on the database host
  - pip or yum

Inventory and databases [Potential problem]

- Inventory is based on groups of hosts (doesn't map exactly to databases)
- So you do this, one config file per db

```
group_vars/db1

- Inventory
[db1]
host1.example.com

ansible-playbook dbconfig.yml -e db=db1
```

- Then you add another db config (db2), on the same host

```
group_vars/db1
group_vars/db2

- Inventory
[db1]
host1.example.com
[db2]
host1.example.com

ansible-playbook dbconfig.yml -e db=db2
```

- You might get unexpected results (variables might not come from the configuration you expected)

Inventory and databases [Solutions]

- Separate inventory files, one config per inventory

  ```
  $ cat inventory/db1
  [db1]
  host1.example.com
  $ cat inventory/db2
  [db2]
  host1.example.com
  ```

  and target the config with '`ansible-playbook … -i inventory/db1`' etc

- Use fake hosts

  ```
  [db1]
  host-db1    ansible_host=host1.example.com
  [db2]
  host-db2    ansible_host=host1.example.com
  ```

- Use cnames
  - Same concept as fake hosts

Inventory (how we do it, for the most part)

- Inventory contains normal hostgroups
- database config in the same config as host & cluster config (in the same group_vars)
- list of cdbs/pdbs in group_vars
  - This works well since we always create the cdb/pdb

Inventory (random thoughts)

- Try to keep the inventories as standard as possible (for as long as possible)
- Maybe keep inventory in it's own repository (to avoid duplication, if many different repos for management).
  - Possible to softlink, or just point playbook to inventory
- If environment is large, maybe need external service registry (and dynamic inventory script, like for AWS)

Managing passwords

- You should not store plain text passwords in playbooks!
- Ansible-vault
  - Ansible native solution to encrypt YML files that can be included in playbooks
  - Ansible-vault files can be committed to git
- Oracle wallet
  - Ansible-oracle-modules use cxOracle python module that requires OCI client, therefore it also supports Oracle wallet authentication
  - Requires setting up tnsnames.ora and sqlnet.ora also
  - Each TNS name needs password entry in wallet
    - Limitation for large deployments?
- Calling remote password service from playbook
  - We use REST API calls to Passwordstate to fetch individual DB passwords
  - API key can be secured with ansible-vault

Scheduling/running playbooks

- We use Jenkins
- Basically 3 ways of running jobs
  - Manually
  - Trigger based
  - Scheduled

Running playbooks (a few other options)

- Ansible Tower (commercial offering)
- Ansible AWX (open source Tower)
- Rundeck
- Semaphore
- *Tensor*
- *Polemarch*

Ansible is great, but…

- … it is not for everything
- There are better solutions for:
  - Managing schema objects
  - Deploying database code
- Better look at specific tools for these purposes:
  - Liquibase
  - FlyWay
- But… Ansible can execute these tools as part of the release process orchestration

Resources

- Ansible homepage: https://www.ansible.com/
- Oracle database modules for Ansible:

  https://github.com/oravirt/ansible-oracle-modules
- Deploying RAC with Ansible:

  https://github.com/oravirt/ansible-oracl

Download scripts

- Here you can download the scripts used in this presentation
  – https://github.com/oravirt/hroug-2017

Thank You