

■ ■ ■ Automation of Enterprise Manager with EMCLI



Robert Cramés
Senior Consultant
robert.cramés@trivadis.com

trivadis
makes IT easier. ■ ■ ■

Trivadis Facts & Figures



- Currently 13 locations with over 500 employees
 - Baden, Basel, Bern, Brugg, Lausanne, Zurich
 - Düsseldorf, Frankfurt, Freiburg, Hamburg, Munich, Stuttgart
 - Vienna

- Since January 2008, the Trivadis Group has a qualified majority of shares in MIK AG, based in Brugg

- Financially independent and sustainably profitable

- Key figures in 2007
 - Consolidated income
CHF 98 million / EUR 60 million
 - Services for more than 600 clients in over 1'500 projects
 - Over 125 Service Level Agreements
 - More than 5'000 training participants per year
 - Research budget:
CHF 6.0 million / EUR 3.6 million

Trivadis Solution Portfolio



- **Application Development**
 - .NET, Java, ADF, Forms, XML, SOA, custom software, migration und integration
- **Business Communication**
 - Enterprise business communication, distributed output management, personalized communication, eBusiness exchange
- **Business Intelligence**
 - Data integration - data warehousing - BI platforms - corporate performance management suites
- **Managed Services**
 - Application and infrastructure managed services, adaptive sourcing, ITIL, high availability, consolidation, virtualization, migration, automation, backup & recovery
- **Training**
 - Blended IT-Learning, skill management, public trainings, onsite trainings

Preface



- As seen in the other speeches, Provisioning is a high end feature of Grid Control
- But, as all high end features in oracle, you have to license it (most of my customers do not have site licenses)
- What, if Your Environment is not that large, that it's worth evaluating / developing / testing Provisioning
- What, if the tools You are currently using are that smart, that standardisation is not Your problem
- This speech will show, how to use emcli to optimize Your own 'provisioning' concepts

Agenda



Data are always part of the game.

- A poll ...
- emcli - Overview and Installation
- Set up Monitoring
- Working with groups
- Administer targets
- Users and credentials
- Execute Host and SQL-commands
- Blackouts
- Essence

A poll ...



- Trivadis Consultants were asked ‘what are You use emcli for?’ – here are the top 5
 - Setup Trivadis’ definition of monitoring
 - Administer groups and their Members
 - Administer targets
 - Execute host-commands / sql-commands
 - Administer users and credentials
- They use emcli directly from commandline, within scripts or via sql
- Here are some examples covering these topics...

Agenda



Data are always part of the game.

- A poll ...
- emcli - Overview and Installation
- Set up Monitoring
- Working with groups
- Administer targets
- Users and credentials
- Execute Host and SQL-commands
- Blackouts
- Essence

Overview



- The command line interface (emcli) allows the execution of a subset of the Grid Control functionality from the commandline
- With this feature this functionality can be integrated to various, self written, programs and scripts
- The Command Line Interface can be installed on any client, no additional Oracle Software is needed, but java has to be installed and part of the path-variable
- There are approx. 160 commands in 27 Verb-Groups
- Helpful: help → emcli help <verb>

Installation and setup



- Preparations:
 - Java has to be installed, jar must be in the path
 - Copy emcli's Java Archive from:
 - \$OMS_HOME/sysman/jlib/emclikit.jar or
 - http://<OMS>:<OMS_PORT>/em/console/emcli/download

■ Installation ...

```
java -jar emclikit.jar client -install_dir=/opt/local/emcli
```

- The CLI must be set up and connected to an OMS:

```
emcli setup -url=http://tvdoms:4889/em -username=sysman
```

Installation and setup



- emcli installations connecting to multiple OMS's are possible

```
emcli setup -dir C:\oracle\emcli1 -url=http://rom:4889/em -  
username=sysman
```

```
emcli setup -dir C:\oracle\emcli2 -url=http://wien:4889/em -  
username=sysman
```

- Use EMCLI_STATE_DIR to point to the appropriate directory

```
set EMCLI_STATE_DIR=C:\oracle\emcli1  
  
emcli setup  
Oracle Enterprise Manager 10g Release 10.2.0.5.0.  
Copyright (c) 1996, 2009 Oracle Corporation...  
CONFIG DIRECTORY : C:\Documents and  
Settings\Administrator\.emcli  
OMS                : http://tvdoms:4889/em  
EM USER            : sysman  
TRUST ALL           : false
```

Some additional informations



- You can use all emcli commands in scripts
- Keep in mind to start emcli in Windows-CMD-Scripts with 'call' – i.e. 'call emcli ...'
- emcli has returnvalues which can get evaluated
- The demos are a little abstract and reduced to the emcli command, to show what you finally really need

Agenda



Data are always part of the game.

- A poll ...
- emcli - Overview and Installation
- Set up Monitoring
- Working with groups
- Administer targets
- Users and credentials
- Execute Host and SQL-commands
- Blackouts
- Essence

Setup Monitoring



- We, at Trivadis, decided to define and use a standard in monitoring Databases (and dependant targets, such as listeners, hosts and the agent) with Grid Control, to offer our customers a quick solution to monitor their environments
- It is a basic monitoring, covering the needs of DBA's in terms of availability of targets
- It consists of a set of monitoring templates, transportable by using emcli
- Unfortunately, another important part of monitoring – notification rules – are currently not fully supported by emcli
- Also missing: a possibility to delete existing monitoring templates

Setup Monitoring



- At first – you have to have the basic monitoring templates ;-)

Monitoring Templates

Monitoring Templates can be used to apply a subset of monitoring and policy settings to multiple targets. This applied to a target, any monitoring settings not specified in the template remain unaffected on the target.

Simple Search

Template Name [Advanced Search](#)

Target Type
 Display Oracle provided templates

Pending Apply Operations 0

|

| Select | Name ▾ | Target Type | Pending Apply Operati |
|----------------------------------|------------------------------------|-------------------|-----------------------|
| <input checked="" type="radio"/> | TVD_HOST_TEMPL | Host | |
| <input type="radio"/> | TVD_DATABASE_TEMPL | Database Instance | |

Setup Monitoring



- Now, you can export these templates with emcli

```
emcli export_template \  
-name="TVD_DATABASE_TEMPL" \  
-target_type="oracle_database" \  
-output_file=exp_tvd_database_template.out
```

- Once exported, the generated output_files are a quick way to setup monitoring templates

```
emcli import_template \  
-files="exp_tvd_db_template.out;exp_tvd_host_template.out"
```

- BTW: Output-Files are in xml format

Setup Monitoring



- When templates are finally imported, we have to apply these templates ...

```
emcli apply_template -name="TVD_HOST_TEMPL"  
-targets="TVD_PROD_GROUP:composite"  
-copy_flags="1"
```

Agenda



Data are always part of the game.

- A poll ...
- emcli - Overview and Installation
- Set up Monitoring
- Working with groups
- Administer targets
- Users and credentials
- Execute Host and SQL-commands
- Blackouts
- Essence

Working with groups ...



- Groups are one important part when defining monitoring, because monitoring templates can be applied to groups, notification rules can be applied to groups as well, ...
- Creating Groups can be a time consuming work – when done with the GUI
- Groups are ‘living’ objects – Groupmembers are added or deleted, Groups get rearranged, a.s.o, so you have to provide a mechanism to recreate groups regularly, thus keeping your groups up to date
- The method to keep the efforts low: emcli ...

Working with groups ...



- Create a group

```
emcli create_group -name="TVD_PROD_GROUP"
```

- Add members to a group

```
emcli create_group -name="TVD_PROD_GROUP"  
-add_targets="<TargetName>:<TargetType>; ... "  
OR  
emcli modify_group -name="TVD_PROD_GROUP"  
-add_targets="<TargetName>:<TargetType>; ... "
```

- Delete members from a group

```
emcli modify_group -name="TVD_PROD_GROUP"  
-delete_targets=<TargetName>:<TargetType>
```

Working with groups ...



- Get informations about your groups

```
emcli get_groups
Target Name      Target Type
TVD_PROD_GROUP  group
```

- Get informations about a specific group

```
emcli get_group_members -name=TVD_PROD_GROUP
Target Name                Target Type
TVDOMS                     host
OMSREPO_site1.trivadis.com oracle_database
LISTENER_TVDOMS            oracle_listener
```

Agenda



Data are always part of the game.

- A poll ...
- emcli - Overview and Installation
- Set up Monitoring
- Working with groups
- **Administer targets**
- Users and credentials
- Execute Host and SQL-commands
- Blackouts
- Essence

Administer Targets



- Targets are the base of our daily business
- In Scripts to create databases, emcli is used to add the database directly to GC, to bring it to the right group, to setup preferred credentials ...
- Delete database scripts include emcli-commands to delete the target in the repository, though cleaning up our repository
- In short: emcli commands supports us in keeping a high quality of grid control's repository

Delete targets...



- To delete a target, relations have to be kept in mind:
 - A Host can not be deleted, if there are still Databases registered

```
emcli delete_target \  
    -name="SALES. trivadis.com" \  
    -type="oracle_database"
```

- Tip: To delete an entire host including all of its dependant targets:
exec mgmt_admin.cleanup_agent(<hostname>:<port>');
- Attention: Effectively, targets will be deleted through an internal job, this can take time, do not add it again immediately! (But there is no emcli command to check this)

| Target Name | Target Type | Agent URL | Time delete submitted | Time delete completed | Time of last update |
|------------------------|-----------------|--|----------------------------|----------------------------|----------------------------|
| SALES.ttc.trivadis.com | oracle_database | https://wien.ttc.trivadis.com:3872/emd/main/ | Aug 31, 2006 6:17:00 PM | Aug 31, 2006 6:17:02 PM | Aug 31, 2006 6:16:59 PM |

Add Targets



- Per emcli all target types can be added

```
emcli add_target \  
  -name="SALES.trivadis.com" \  
  -type="oracle_database" \  
  -host="TVDOMS" \  
  -credentials= \  
    "UserName:dbsnmp;password:manager;Role:Normal" \  
  -properties= \  
    "SID:SALES;  
    Port:1521;  
    OracleHomeD:\oracle\product\10.2.0;  
    MachineName:TVDOMS"  
  -groups="TVD_PROD_GROUP:group"
```

- Tipp: The names of the target types can be found in sysman's table: mgmt_target_types

Get informations about targets



- You can get informations from the oms about the current state of your targets

```
emcli get_targets -targets="oracle%" -alerts -script
```

| Status ID | Status | Target Type | Target Name | Critical | Warning | | |
|-----------|--------------|----------------------|---------------------------------------|----------|---------|--|--|
| 1 | Hochgefahren | oracle_apache | EnterpriseManager0.tvdoms_HTTP Server | 0 | 1 | | |
| 1 | Hochgefahren | oracle_beacon | TVDOMS_beacon | 0 | 0 | | |
| 1 | Hochgefahren | oracle_csa_collector | TVDOMS_oms_csa_collector | 0 | 0 | | |
| 1 | Hochgefahren | oracle_database | OMSREPO_sitel.trivadis.com | 30 | 97 | | |
| 1 | Hochgefahren | oracle_emd | TVDOMS:3872 | 0 | 1 | | |
| 1 | Hochgefahren | oracle_emrep | Management Services and Repository | 1 | 0 | | |
| 1 | Hochgefahren | oracle_ias | EnterpriseManager0.tvdoms | 0 | 0 | | |
| 1 | Hochgefahren | oracle_listener | LISTENER_TVDOMS 11 | 7 | | | |
| 1 | Hochgefahren | oracle_webcache | EnterpriseManager0.tvdoms_Web Cache | 0 | 1 | | |

Agenda



Data are always part of the game.

- A poll ...
- emcli - Overview and Installation
- Set up Monitoring
- Working with groups
- Administer targets
- Users and credentials
- Execute Host and SQL-commands
- Blackouts
- Essence

Users and credentials



- Useraccounts in OMS's are frequently changed. You have to ... :
 - ... grant access to the OMS for new employees
 - ... revoke access from employees who has left the company
- Or – Database's passwords changing regularly, so You have to reset preferred credentials for all users ...
- Emcli helps to keep the overhead small ...
- ... all this can be automated by scripts (and the input comes from the repository)

Users and credentials



- Create a new user is quite simple ...

```
emcli create_user -name=DOAGTEST -desc="This is a new  
superuser" -privilege="SUPER_USER" -expire="true" -  
password="manager"
```

- ... and to delete him, as well

```
emcli delete_user -name=DOAGTEST
```

- Setting preferred credentials was a time consuming work ...

```
emcli set_credential -target_type=oracle_database  
-target_name=OMSREPO_site1.trivadis.com  
-credential_set=DBCredsNormal  
-user=doagtest  
-column="username:system;password:manager;role: ' ' "
```

Agenda



Data are always part of the game.

- A poll ...
- emcli - Overview and Installation
- Set up Monitoring
- Working with groups
- Administer targets
- Users and credentials
- Execute Host and SQL-commands
- Blackouts
- Essence

Execute commands - Prerequisites



- To successful run 'emcli execute ...' you have to ... :
 - Setup the complete preferred credentials of the databases (including host-credentials in the database section of preferred credentials)
 - Setup the complete preferred credentials of the hosts
 - Keep in mind, that target_names are Case-sensitive – even when using emcli under Windows

Execute SQL Statements against multiple DBs



- An example for executing a sql ...

```
emcli execute_sql
-sql="SELECT username, default_tablespace FROM dba_users"
-targets="TVD_PROD_GROUP:composite"
-credential_set_name="DBCredsNormal"

*****
* Target: OMSREPO_site1.trivadis.com:oracle_database
* Execution Status: Succeeded
*****

USERNAME                                DEFAULT_TABLESPACE
-----                                -
SYSTEM                                  SYSTEM

*****
* Execution Summary
*   Targets Succeeded: 1
*   ...
```

Execute Host Commands against multiple Hosts



- An example for executing an host-command

```
emcli execute_hostcmd -cmd="dir D:\oracle"
-credential_set_name="HostCredsPriv"
-targets="TVDOMS:host"

*****
* Ziel: TVDOMS:host
* Ausführungsstatus: Erfolgreich
*****

Volume in drive D is Data1
Volume Serial Number is 9C4E-2ABD

Directory of D:\oracle

26.02.2009  21:36    <DIR>          .
26.02.2009  21:36    <DIR>          ..
25.02.2009  22:28    <DIR>          admin
20.03.2009  10:42    <DIR>          etc
...
```

Agenda



Data are always part of the game.

- A poll ...
- emcli - Overview and Installation
- Set up Monitoring
- Working with groups
- Administer targets
- Users and credentials
- Execute Host and SQL-commands
- Blackouts
- Essence

Blackouts



- Even though the agent is able to handle blackouts (and this is probably the right point for that), emcli can do that, too
- For a Blackout, a predefined reason has to be entered. Only a Super Admin is able to define new reasons
- Which reasons exists (60 by now):

```
emcli get_blackout_reasons
...
DB: Database Cold Backup
DB: Database Configuration Change
DB: Database Decommissioning
DB: Database Emergency
...
EM: Agent Configuration Change
EM: Agent Upgrade
EM: OMS Server Configuration Change Testing
```

Start Blackout



- Start a Blackout for a database
- From now on, maximal duration 30min.

```
emcli create_blackout
-name="Security Patch CPU Jan 2009 on OMSREPO"
-add_targets="OMSREPO_site1.trivadis.com:oracle_database"
-reason="Security Patch"
-description="Very important security patch!"
-schedule="duration::30"
```

- Can be planed into the future
- Can be repeatable (declare Interval)
- Runs under the credentials of the emcli-user

Stop Blackout



- Blackouts can be stopped before the scheduled end-time

```
emcli stop_blackout  
-name="Security Patch CPU Jan 2009 on OMSREPO"
```

- Keep in mind: Stopping a blackout only stops the blackout – when you try to create a blackout with the same name you'll receive an error, stating the blackout is already there. It's a good advice to stop the blackout and afterwards to delete this blackout (it's not possible to start an existing blackout, using emcli)

```
emcli delete_blackout  
-name="Security Patch CPU Jan 2009 on OMSREPO"
```

Agenda



Data are always part of the game.

- A poll ...
- emcli - Overview and Installation
- Set up Monitoring
- Working with groups
- Administer targets
- Users and credentials
- Execute Host and SQL-commands
- Blackouts
- Essence

Essence



- Good opportunities to include Grid Control features into your own scripts
- The existing commands work fine
- The commands are compatible with older emcli versions
- But there are (still) some important things missing:
 - Administer notification rules and schedules
 - Clone databases
- After that it would be (it becomes) perfect ... But even if things are missing: It's an important feature, making the daily business a little easier ...

■ ■ ■ Thank you!



?

www.trivadis.com

trivadis
makes **IT** easier. ■ ■ ■

