Notes, abstract

Management-decisions, Hardware-reality and intended cost-savings forced us to concentrate many databases on a small number of (old-ish) Exadata machines.

The presentation will describe the challenges we faced during migration and in operations.

We will indicate the success-factors and challenges for consolidation, and point out fixes and alternatives.

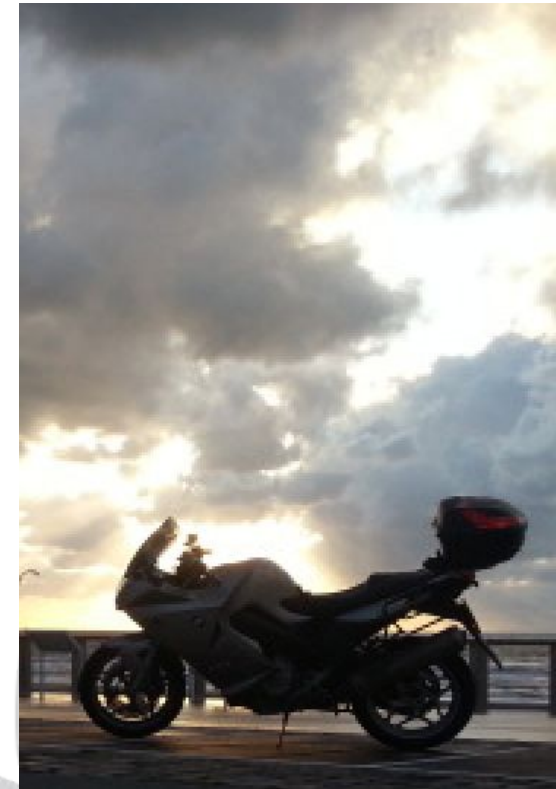The attendee will learn how to do sensible "consolidations", and how to avoid problems.

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Piet de Visser
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Consolidation – again.

Hardware or Cloud – this time we do it right.

PDVBV – The Simple (oracle) DBA

Favorite Quotes: "The Limitation shows the master" (Goethe), "Simplicity is not a luxury, it is a necessity. Unfortunately, "Complex' solutions sell better. (EW Dijkstra).

Logo Cloud

4SYNERGY

- **Shell**
- **Philips**
- **ING bank**
- **Nokia**
- **(dutch gov)**
- **Insinger, BNF**
- **Etihad**
- **NHS**
- **BT**
- **Claritas, Niels**
- **Unilever**
- **Exxon**
- **GE**

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Don't like Self–Inflation... But Hey, this was such a cool Idea (from a marketing guy)...
Logos of my major customers over time. If you want your logo here: Hire me.

What does it look like..

Couldn't resist... after this changing room, not allowed to take pictures anymore..
For travel pictures from Asia: later...

4SYNERGY

Agenda   (approx 45 minutes)

History   **(how often...)**

Case description (why)   (Clever Sales)

Consolidation...   (Why? How...)

CLOUD!   (worked for us)

What _do_ I see   (it depends)

Did it ever work ?   (you tell me)
10 min Discussion   (Do Challenge!)

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Agenda: why we had to consolidate on Exadata. Why consolidation can or cannot work. Tricks...

How often did we consolidate…

We have seen many configurations by now, and most configuration designed for "cost saving: failed
Reasons why "consolidation" can or cannot work are complicated…

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We were simply ordered to move as many databases onto as few machines as possible...
Japanese : Oshiya = pusher

Situation happened because "business" and "provider" both had a drive to grow, to create many systems and databases.
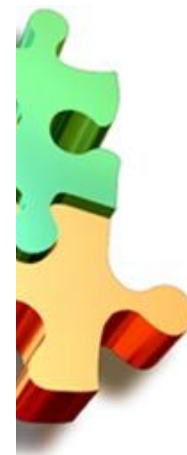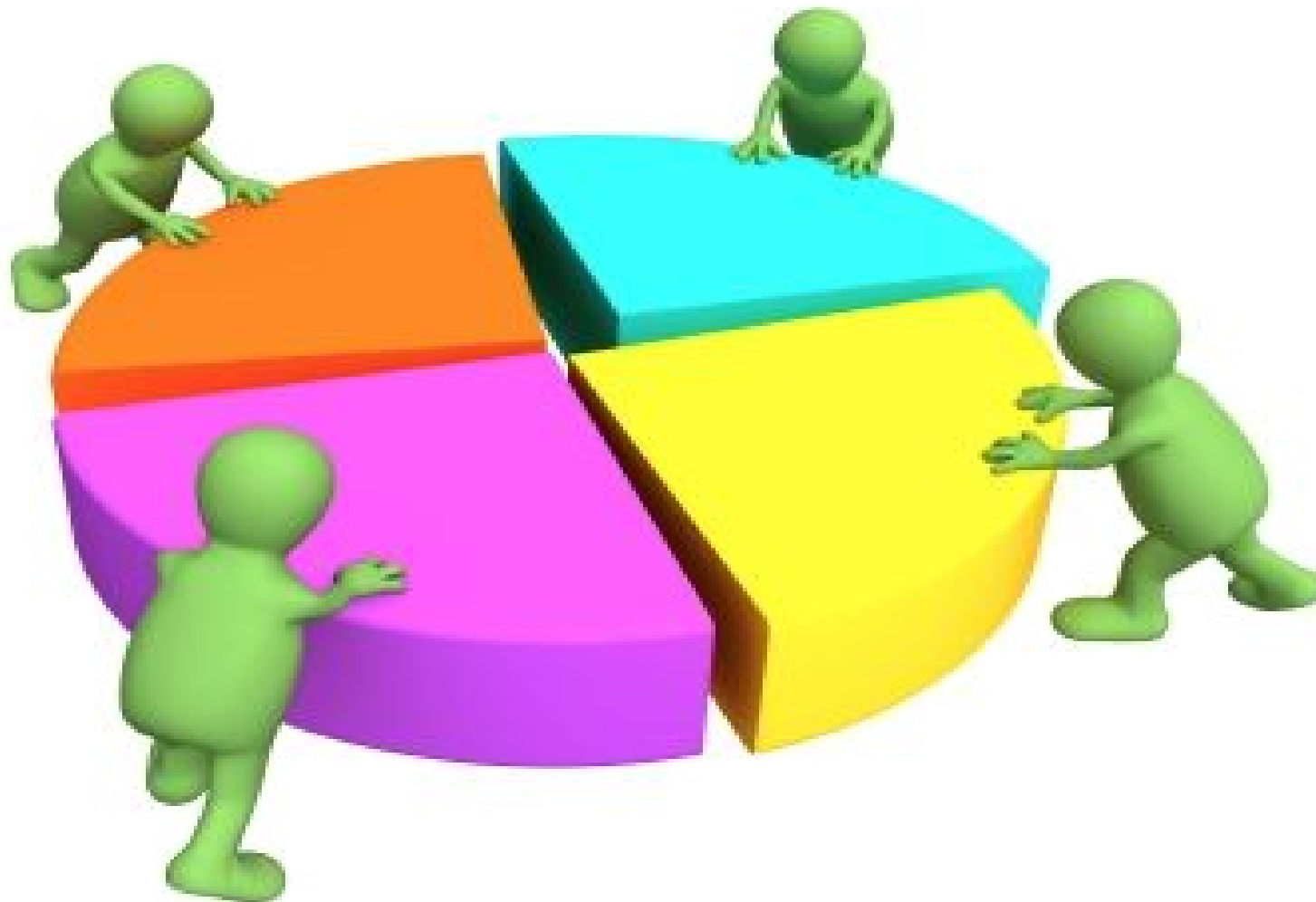
Why consolidate this time ? (2 / 2)

4SYNERGY

Business

- **Growing, need projects, need DBs !**
- **Provider: happy to "provide" (more work)**

Few years later: the License Scam - too many !

- **1000s of databases, all over organisation**

Clever Sales + Lawyers …

Deal:

- **Use Exadata, and we forget …**

Once the data centres had too many databases, the lawyers and salespeople forced a new deal..
"Use Exadata and we forget all about it"

2014, Deal was made: Exadata

Client:
- **Needs to "get out of jail"**
- **(IT knowledge, DEV/OPS, has "evaporated")**

Oracle:
- **Needs to meet Exa-data sales target.**
- **More Exa machines will follow…**

Provider (the system admins)
- **get percentage (referral fee….)**
- **Eager to use new technology**

The deal looks like a win/win : client is "safe", Oracle can meet target, and provide is happy with fee and new toys.. Euforia !

Business : doesn't care, System has to WORK
- **Need to run processes**
- **IT … not "our problem"**

Project managers: Limited horizon, hit and run.
- **Have mission, must stay on Budget.**
- **Declare succes, move to bigger project.**

IT "service provider": $$uck Time…
- **Spend time, "extra work…"**

The "Business" is slightly annoyed: they didn't ask for another change/cycle/disruption.
The project–managers want to declare success and move on, the Service provider: want to :work"

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Implementation of "management decision" ..

- **Migration to EXA…**
- **"Must Happen".**

IT(-provider) sets the rules (must-use-service)

- **New and more strickt Environment**
- **Migration-methods: dictated.**
- **No Dev / Test (existing systems…)**
- **DRP: only after go-live.. ???**

Migration–projects have started… new envirnments much more restricted, and no real room for dev/test
Feels like Indiana jones running in front of a rolling stone

https://www.youtube.com/watch?v=db5rRtOExbA

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And than you realize…
This is happening…

Dev/Testing: none ???

- **Would need additional, extra system**

Restrictions:

- **Less privs (awr, v$, sys-packages..)**
- **More outages (patches dictated by IT)**

IT, Admin, (if any) was not ready… :

- **Discovered Exa: "We just got this system…"**
- **The DBA team (operators), only know "database"**
- **No monitoring (runaways…)**

Once this ball is rolling: Restrictions ! Test becomes "extra system" and expensive (it is the same dabase, why do you want to test..).. New system is much more restricted. And Support : "discovering" Exadata

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Migration:

- **"Provider" prefers exp/imp (loooong)**
- **OK then…: Datapump (still long!)**

Alternatives we asked for:

- **DP over DB-links (network … #$%@ !!)**
- **Backup/restore/recover/RMAN?**
  - **DBA afraid of version problems**
- **DG Standby + cutover: "Version problem"**
- **Streams: Version problem + complex to setup**
- **Golden-Gate: long lead-time, and Very Expensive.**

We discover that this "must do" migration is a coup. A dictator seized Power…
IT provider is now .. In charge.

What business (users) discover.. (3/3)

DRP, using DG, is Much extra work…

- **Standby (DG) on "other system", other VIP.**
- **Untested. (it will just work … ?? - NO!)**
- **DRP is more then just DG: the Application…**
- **Had to declare "accept" as "live" to test DRP.**

Capacity Monitoring: no Babysitters ?

- **From AWR we can see system busy/not…**
- **Runaways from DBA and other system ???**
- **During Migration: File system full (on FTP!)**

During migration we discover more and more "lacking preparation"
You can see why "consolidation" is sometimes a challenge.. (problem of training, problem of listening)

Beware: "noisy neighbours", Capacity

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Warning from IT-provider:
- – **"You should behave like good neighbour…"**

Some Applictions are "noisy"
- – **Batch-windows and CPU-runaways..**
- – **Memory leaks**
- – **DBMS_STATS at 23:00   (... 10x ....)**
- – **Parallel_degree_policy (manual, use DOP)**
- – **Log, trace-files grow, are kept forever ??**
- – **Slowdown on Sat 0600 – 1600 ????**

Image over
alloc

Who checks this ? … Users Do (and AWR helps)
- – **But who is causing it ?**

We even got warning: don't be noisy, be a good neighbour.. (don't even mention "over allocation"…
But when we suffered (awr showed it), nobody could tell who made the noise… (Sat 0600–1600??)

4SYNERGY

Consolidation: is possible…

Cost savings - Really ?
- **Extra effort to consolidate.**
- **Savings "on paper" ?**

Simpler "admin" – Really ?
- **Consolidated system is more Complex**
- **(not on purpose, but that just happens)**

Benefits? … Potentially, Yes. If done "Well"

During migration we discover more and more "lacking preparation"
You can see why "consolidation" is sometimes a challenge..

Co-habitation…. (fun!)

Co-habitation: The real problem.

- **Living with a partner (+kids) is complicated,**
- **Living with mother-in-law is more complicated**
- **Living with strangers is… difficult.**

Outages / Patches… more parties.

- **Who decides ? (nobody: IT Dictates !)**

Troubleshooting: Complex.

- **Every other party is "suspect"**

The technical and "organizational" issues pup up quickly.
And the drive to consolidate is solely from IT, the business will want "own system" again…

Analogy: Military

Is this your business ?

(was it fun?)

Military: "consolidated" units, but under strict command, and with a common goal.
Business units or IT systems are not comparable to Soldiers

City-living: (would you?)

I know too many "bad" examples of consolidation ... People and Organizations probably want to "differ", rather then to "consolidate". And nobody likes "constraints"

Saved by the Cloud (AWS / RDS)

Customer "discovered" RDS

- **VPC, so AWS is "part of our network"**
- **Very Cheap to users/project (at first)**
- **BYOL is possible (we can have EE !)**

Outages / Patches… Predictable (no Dictatorship!)

Main Advantage: no "IT-Provider" involved

Suddenly, we were given an alternative: RDS (and other AWS services, if needed). In OUR CASE this was an improvement. We got more "control" over RDS than we had over "IT–provider"

RDS: We got back "Control"

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Suddenly, we were given an alternative: RDS (and other AWS services, if needed). In OUR CASE this was an improvement.
We got more "control" over RDS than we had over "IT-provider"

Consolidation vs RDS ??

Consolidate?

Analogy: Beehive (split, rather then merge)

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Nature: does not consolidate. No "mergers" in nature ?
Opposite: nature tends to split: beebhives, herds,

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- **Forced "consolidation" of (bespoke) systems … ?**
    - **Too many People factors involved.**
    - **Too many technical problems**
    - **Preferably not (… not yet…)**

- **Consolidation _may_ work.**
- **If .. Business is unaware of it…**
- **If .. IT is Capable, and Stealthy.**

- **Example: Email… (where is your mailbox?)**

Be like a duck.
Remain calm on the surface

and paddle like
HELL underneath."
Michael Caine

If a system is dear and close to a business: the owner's sentiment, the desired "control", and the (unexpected) complexity of systems probably prevent easy consolidation. Re–think !
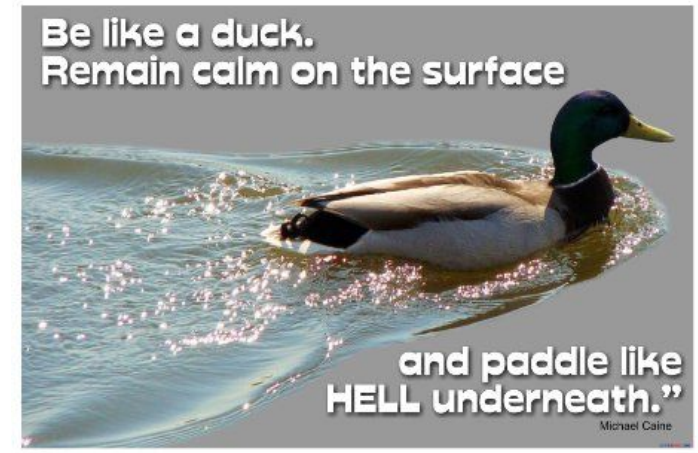
- **AWS and notable RDS worked "in our case"**
  - **Small/medium sized DB (<=1T, <=16CPUs)**
  - **VPC already in place.**
  - **Less "IT infra" to worry about.**

- **Beware of "Cloud"**
  - **Responsability still Yours - Stay Actively Involved.**
  - **Data is now held hostage @ Amazon…**
  - **Network (connectivity) is even more vital**
  - **You still need to "think" and "own" your IT.**

If a system is dear and close to a business: the owner's sentiment, the desired "control", and the (unexpected) complexity of systems probably prevent easy consolidation. Re–think !

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Don't Take my word for it…

Try for yourself..

Or think of these:

"Simplicity is a pre-requisite for Reliability" (Prof
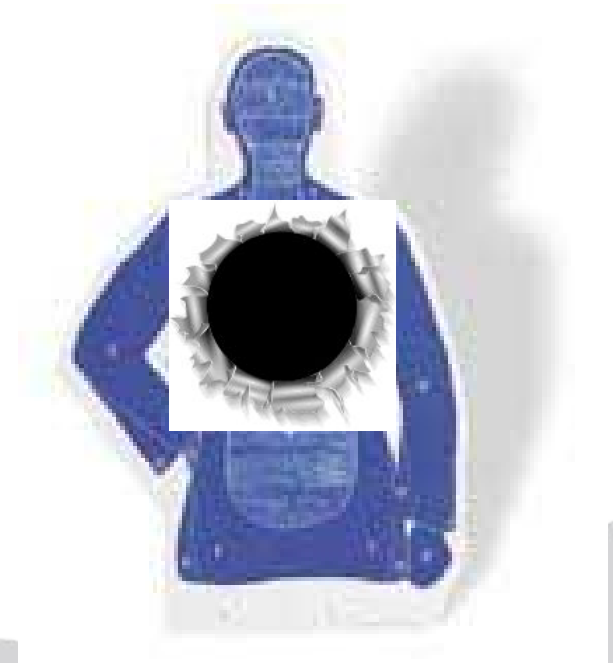   E. Dijkstra)

"The limitation shows the master" (Goethe)

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Majority of times, I have been WRONG.
So go see for yourself – but don't complicate life.   "In der Beschrankung zeight sich der Meister"

- **Questions ?**

- **Reactions ?**

- **Experiences from the audience ?**

Question and Answer time. Discussion welcome   (what about that Razor?)
Teach me something: Tell me where you do NOT AGREE.

What can you do... ?

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Do what you can,
with what you have,
where you are.
[Theodore Roosevelt](#)

BURT GUMMER
Doin' What I Can With What I Got

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There you are...
Theodore Roosevelt (or Burt Gummer @ Tremors)

Coffee…

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Question and Answer time. Discussion welcome   (what about that Razor?)
Teach me something: Tell me where you do NOT AGREE.

Lunch …

4000+ PDBs.. – is that to surpass Microsoft ?
PDBs for test... : does need a DEVOPS vision.
 - self-service, automatic tesing..

APP Container? What is wrong with Grant-select ?

• Engineered systems are so last decade
"in silicone", DAC processors.. New buzzword
Sharding: oracle discovered share-nothing.

Ai.. They divide the "funtionality" over many layers… COMPLEX.
Google does this under water since.. 2000?
Stick with shard-director..
Re-balance ??? Automatic????=> brownout

.. The optimizer...

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Question and Answer time. Discussion welcome   (what about that Razor?)
Teach me something: Tell me where you do NOT AGREE.

Lunch …

Breakglass / envelope
Sys in hands of "sec team", admin+audit around it.
Privs in dev versus Prod.
Sudo + log
? Select-any ?
OEM.. Another exposure/surface

Look for easy-protect-rules of thumb
- **Access (sudo)**
- **Audit – and secure it**
- **Grant + elevation**

Test copies
Data in box, then control all entry points

Workforce needs to understand + live by certain principle... ?
AWS is good model, RDS, bluegekko.

Xdb check how it is locked down

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Question and Answer time. Discussion welcome (what about that Razor?)
Teach me something: Tell me where you do NOT AGREE.

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4 S Y N E R G Y

New env not faster: the CBO will stop you…

Consolidation: control goes back to IT,
not always good.

Consol:
- drop DOP,
– **Reduce SGA, remvoe bitmaps**
– **Parallel ?**

– **Why 32K cache /blocks ?**

Exa data doesnt seem fit for n-DBs ,more like 1-Large DB.

Question and Answer time. Discussion welcome   (what about that Razor?)
Teach me something: Tell me where you do NOT AGREE.