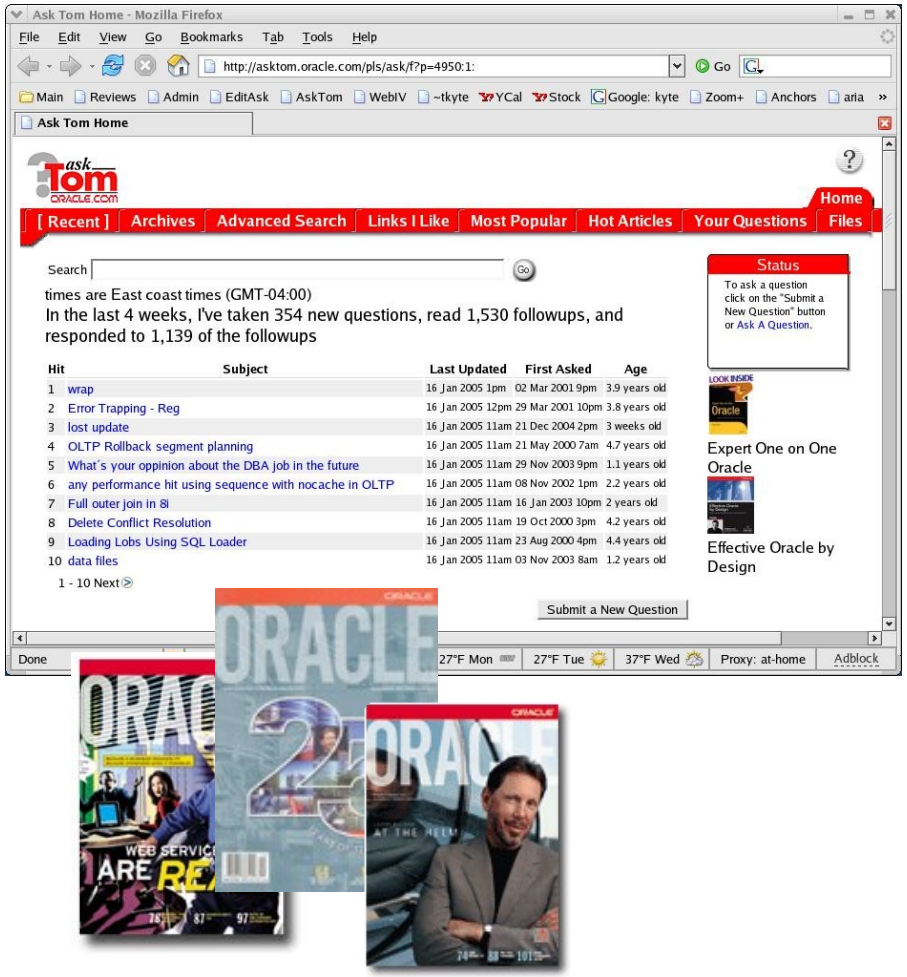

ORACLE

Who am I



- Been with Oracle since 1993
- User of Oracle since 1987
- The “Tom” behind AskTom in Oracle Magazine

  www.oracle.com/oramag
- Expert Oracle: Database Architecture
- Effective Oracle by Design
- Beginning Oracle
- Expert One on One Oracle

Worst Practices For Developers and DBAs Alike

You Should Probably Never Question Authority

Never

Not Ever

(it bothers them when you do)

"*Never* Question Authority."

- Experts are *always right*
- You know the information is accurate when the author clearly states:
  - It is my opinion...
  - I claim...
  - I think...
  - I feel…
  - I ***KNOW...***
- Nothing need be backed up with evidence
- Things ***never*** change
- Counter Cases do not prove anything
- If it is written down, it must be true

You Probably Do Not Need to Use Bind Variables

It is so much easier to code without them!

```
query =
'select *
   from t
  where x = ?
    And y = ?'

Prepare it
Bind x
Bind y
Execute it
Close it
```

Too much code!

```
query =
'select *
   from t
  where x = '||x||'
    And y = '||y

Execute it
```

Look at how efficient I am!

And very secure too!

Enter Username: tom’ or 1=1 –

Enter Password: i_dont_know’ or 1=1 –

```
Query =
“Select count(*) “ +
“  from user_pw “ +
“ where uname = ‘” + uname + “’” +
“   and pword = ‘” + pword + “’”

Select count(*)
  From user_pw
 Where uname = ‘tom’ or 1=1 – ‘
   And pword = ‘i_dont_know’ or 1=1 – ‘
```

Performance isn't a concern

- It is not a problem that a large percent of my program runtime will be spent parsing. That is ok!

```
SQL> set timing on
SQL> begin
  2      for i in 1 .. 100000
  3      loop
  4          execute immediate
  5          'insert into t (x,y)
  6           values ( ' || i ||
  7           ', ''x'' )';
  8      end loop;
  9  end;
 10  /

PL/SQL procedure successfully completed.
Elapsed: 00:01:33.85
```

Performance isn't a concern

- It is not a problem that a large percent of my program runtime will be spent parsing. That is ok!

```
SQL> set timing on
SQL> begin
  2      for i in 1 .. 100000
  3      loop
  4          execute immediate
  5          'insert into t (x,y)
  6           values ( :i, ''x'' )'
  7          using i;
  8      end loop;
  9  end;
 10  /

PL/SQL procedure successfully completed.
Elapsed: 00:00:04.69
```

Performance isn’t a concern

- It is not a problem that a large percent of my program runtime will be spent parsing. That is ok!

- That 95% of my runtime was spent parsing SQL in a single user test is perfectly OK!

And I'm sure memory utilization is OK

```
SQL> select case when instr( sql_text, ':' ) > 0
  2              then 'bound'
  3              else 'not bound'
  4           end what, count(*), sum(sharable_mem) mem
  5   from v$sql
  6  where sql_text like 'insert into t (x,y)          values (%'
  7  group by case when instr( sql_text, ':' ) > 0
  8                then 'bound'
  9                else 'not bound'
 10            end;

WHAT          COUNT(*)            MEM
---------- ---------- ------------
not bound         6640   56,778,665
bound                1        8,548

SQL> show parameter shared_pool_size

NAME                                 TYPE         VALUE
------------------------------------ ----------- --------------
shared_pool_size                     big integer 152M
```

And it'll absolutely scale up!

- Oracle is the most scalable database in the world, it'll take care of it.

```
Run1 latches total versus runs…
Run1            Run2        Diff            Pct
13,349,321      548,684     -12,800,637     2,432.97%
```

Probably
You don’t want to expose end users to errors

When others then null;

- End users would never want to know there was a problem
- Even if the “end user” is really another module calling you
- Just log it – don’t raise it

```
Begin
  …
Exception
When others Then
    log_error( …);
End;
```

Probably The More Generic You Can Make Something, The Better It Is.

Or…

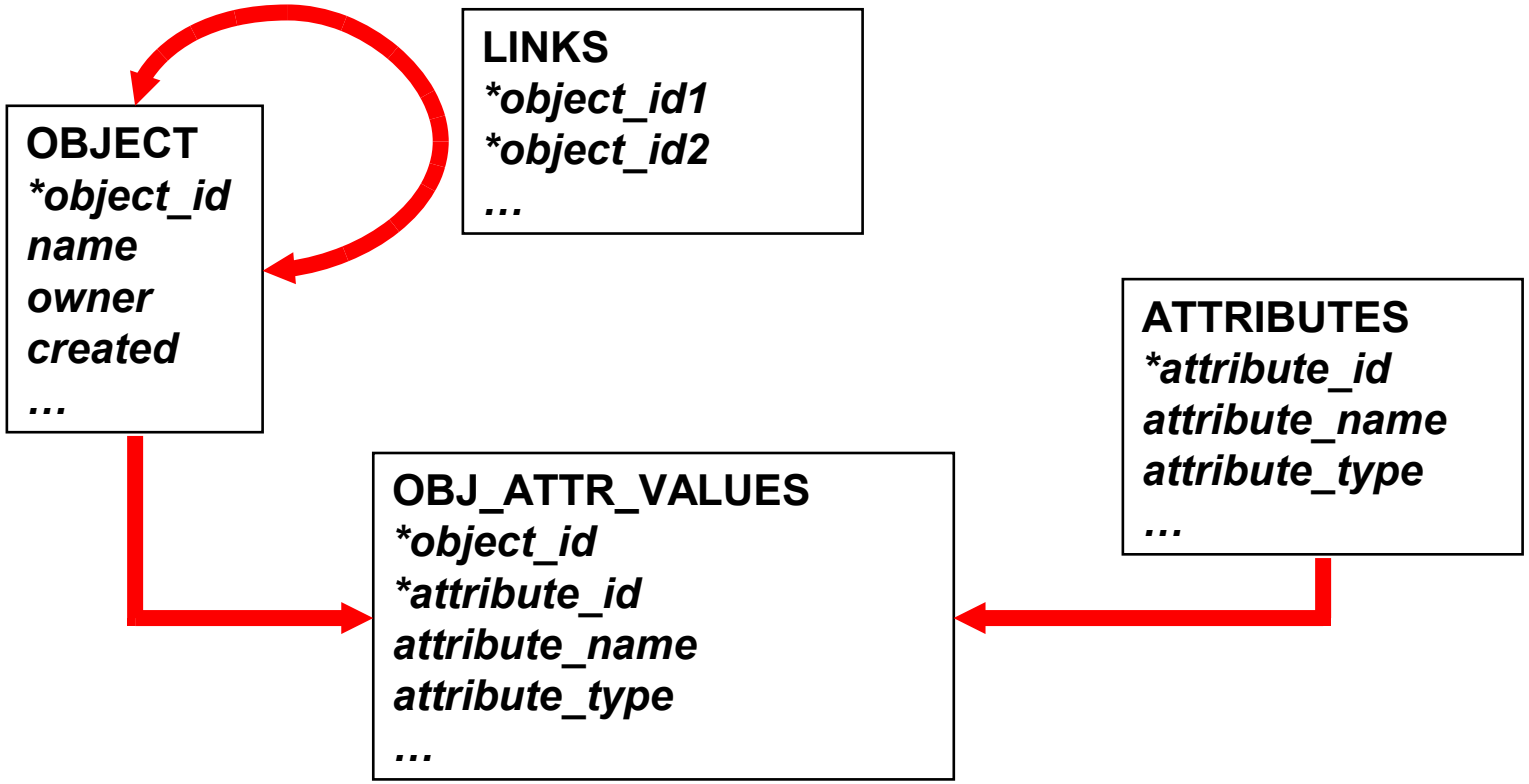
Probably You Do Not Need to Actually Design Anything

Quickly Answer:

- How many tables do you ***really*** need?

Quickly Answer:

- How many tables do you ***really*** need?
- **FOUR** at *most!*



Quickly Answer:

- How many tables do you ***really*** need?
- But of course **ONE** is *best!*
- And you are industry standard as well!

```
Create table Object
( object_id number primary key,
  data      xmltype );
```

In case you think I make this stuff up…

From - *Wed Nov 08 07:39:19 2006*
X-Mozilla-Status: 0001
X-Mozilla-Status2: 00000000
Return-Path: <xxxxx@xxxxx.com>
Received: from rgmum105.us.oracle.com by rcsmt251.oracle.com
with ESMTP id 218005587116295650 6; Tue, 07 Nov 2006 20:28:26 -0700
…
id C7431B2F2B; Tue, 7 Nov 2006 20:28:09 -0700 (MST)
Mime-Version: 1.0 (Apple Message framework v752.2)
Content-Type: multipart/alternative; boundary=Apple-Mail-107--34306936
Message-Id: <EDEA1DBE-CF47-4D52-9A91-24CC4A208836@mac.com>
From: Dan XXXXX <xxxxxxx@xxx.com>
Subject: Worst Practices
Date: Tue, 7 Nov 2006 19:28:06 -0800
To: Thomas Kyte <thomas.kyte@oracle.com>
X-Mailer: Apple Mail (2.752.2)
X-Virus-Scanned: by Barracuda Spam Firewall at theedge.ca
X-Brightmail-Tracker: AAAAAQAAAAI=
X-Whitelist: TRUE

In case you think I make this stuff up…

Sorry about the unrequested email, but I couldn't resist...

I read your Worst Practices presentation the other day - Very nice, hit a bit close to home for comfort in many cases!

Then today I got an email from one of the contract "developers" our organization deals with, it describes a rewrite of a system that was rolled out a few years back. It was a bit experimental and was always problematic - architectural mess - stuff flying around in files between ftp sites and windows shares and in and out of databases. I (and my cohort DBA) kept asking "Why doesn't this just stay in a database and you query it from wherever".

In case you think I make this stuff up…

... BUT .... It was developed shortly after one of our architect types had heard of XML, so XML had to be used, it wasn't really important what it was to be used for - it was just to be used... and so it was decreed, and it was made so, and it was good... well until the Xindice "database" thing started crapping out every few days... but then some sys admin wrote a script to check and restart Xindice every few minutes, and it was good again.... fast forward a few years.... decision is taken to rewrite and since our Oracle databases don't seem to crash every seventh minute, move the backend from Xindice to Oracle....

In case you think I make this stuff up…

Here is the "punch line" from the email describing the database aspects of the proposed system (slightly edited to remove reference to specific client):

"My current design for the Oracle-ized (Oracle 10g) version requires only a single Oracle table, which will have two columns: a pseudo key (simple varchar2) which will likely actually contain the path to a corresponding document in the WebDAV environment, and a document column of XMLType which will contain the xml for an individual "notice" within the [[snip]], plus an index on the pseudo key column."

In case you think I make this stuff up…

Excellent - one table, with a key and XMLType column - the perfect system... Is this a a cut and paste off slide 21 of your Worst Practices ppt or what???

If I could make this stuff up I could quit my job and work in stand-up.

sigh.

Quickly Answer:

- How many tables do you ***really*** need?
- Either ONE or FOUR, not any more…
- You'll never have to put up with asking the DBA for anything again!
- End users will never want to actually use this data except from your application!
- Performance – it should be OK, if not the DBA will tune the database
- Or we'll just get a new database if the one we are using is not fast.

Probably
You want as many instances per server as possible

Many Instances

- It'll be easier to tune of course – each database can be it's own unique "thing"
  - Multiple dbwr's would never contend with each other
  - Of course there is some magic global view that will point out areas of contention for us
- Everyone will have their "own" memory
  - There won't be *any duplication* or *increased memory* usage due to this
- A runaway process on one instance won't be *my* problem

Probably
You should reinvent as many database features as possible

Reinvent the Wheel

- Writing Code is fun
  - Using built in functionality will not demonstrate your technical capabilities to your manager!
- The builtin stuff only solves 90+% of your extremely unique, sophisticated, 22nd century needs after all
  - It is not good enough
- Besides, you would not want to become dependent on the vendor
  - Much better to be dependent on *you* after all!
- It must cost less, doesn't it?

Probably You Do Not Need To Test

Testing would be such a waste of time

- It might not break
- So why spend the time trying to make it break
- It *probably* won't have any scalability issues
- If you test at all, a single user test on your PC does as well as a fully loaded test on a server
- If you test at all part 2; testing on an empty database is just as good as testing on a full one.
- Just do the upgrade, it'll probably work
- Besides, if I test – they'll expect it works and if it doesn't then I'll be in trouble

Probably You Should Only Use The Varchar Datatype

Varchar2

- It is so much easier after all
- It would never confuse the optimizer

Datatypes are important

```
ops$tkyte%ORA11GR2> create table t ( str_date, date_date, number_date, data )
  2  as
  3  select to_char( dt+rownum,'yyyymmdd' ) str_date,
  4         dt+rownum date_date,
  5         to_number( to_char( dt+rownum,'yyyymmdd' ) ) number_date,
  6         rpad('*',45,'*') data
  7    from (select to_date('01-jan-1995','dd-mon-yyyy') dt
  8            from all_objects)
  9   order by dbms_random.random
 10  /
Table created.

ops$tkyte%ORA11GR2> create index t_str_date_idx on t(str_date);
ops$tkyte%ORA11GR2> create index t_date_date_idx on t(date_date);
ops$tkyte%ORA11GR2> create index t_number_date_idx on t(number_date);
```

Datatypes are important

```
ops$tkyte%ORA11GR2> begin
  2           dbms_stats.gather_table_stats
  3           ( user, 'T',
  4             method_opt=> 'for all indexed columns size 254',
  5             cascade=> true );
  6  end;
  7  /

PL/SQL procedure successfully completed.
```

Datatypes are important

```
ops$tkyte%ORA11GR2> select * from t
  2   where str_date between '20001231' and '20010101';

STR_DATE DATE_DATE NUMBER_DATE DATA
-------- --------- ----------- ----------------------------------------
20010101 01-JAN-01    20010101 ****************************************
20001231 31-DEC-00    20001231 ****************************************
-----------------------------------------------------------------------
| Id  | Operation          | Name | Rows  | Bytes | Cost (%CPU)| Time     |
-----------------------------------------------------------------------
|   0 | SELECT STATEMENT   |      |   254 | 11938 |   208   (1)| 00:00:03 |
|*  1 |  TABLE ACCESS FULL| T    |   254 | 11938 |   208   (1)| 00:00:03 |
-----------------------------------------------------------------------
Predicate Information (identified by operation id):
---------------------------------------------------
   1 - filter("STR_DATE"<='20010101' AND "STR_DATE">='20001231')
```

Datatypes are important

```
ops$tkyte%ORA11GR2> select * from t
  2   where number_date between 20001231 and 20010101;

STR_DATE DATE_DATE NUMBER_DATE DATA
-------- --------- ----------- ----------------------------------------
20010101 01-JAN-01    20010101 ****************************************
20001231 31-DEC-00    20001231 ****************************************
-----------------------------------------------------------------------
| Id  | Operation          | Name | Rows  | Bytes | Cost (%CPU)| Time     |
-----------------------------------------------------------------------
|   0 | SELECT STATEMENT   |      |   254 | 11938 |   208   (1)| 00:00:03 |
|*  1 |  TABLE ACCESS FULL| T    |   254 | 11938 |   208   (1)| 00:00:03 |
-----------------------------------------------------------------------
Predicate Information (identified by operation id):
---------------------------------------------------
   1 - filter("NUMBER_DATE"<=20010101 AND "NUMBER_DATE">=20001231)
```

Datatypes are important

```
ops$tkyte%ORA11GR2> select * from t where date_date
  2  between to_date('20001231','yyyymmdd') and to_date('20010101','yyyymmdd');

STR_DATE DATE_DATE NUMBER_DATE DATA
-------- --------- ----------- ----------------------------------------
20001231 31-DEC-00    20001231 ****************************************
20010101 01-JAN-01    20010101 ****************************************
-------------------------------------------------------------------------------------------
| Id  | Operation                    | Name            | Rows  | Bytes | Cost (%CPU)| Time     |
-------------------------------------------------------------------------------------------
|   0 | SELECT STATEMENT             |                 |     1 |    47 |     3   (0)| 00:00:01 |
|   1 |  TABLE ACCESS BY INDEX ROWID| T               |     1 |    47 |     3   (0)| 00:00:01 |
|*  2 |   INDEX RANGE SCAN           | T_DATE_DATE_IDX |     1 |       |     2   (0)| 00:00:01 |
-------------------------------------------------------------------------------------------
Predicate Information (identified by operation id):
---------------------------------------------------
   2 - access("DATE_DATE">=TO_DATE(' 2000-12-31 00:00:00', 'syyyy-mm-dd hh24:mi:ss')
             AND "DATE_DATE"<=TO_DATE(' 2001-01-01 00:00:00', 'syyyy-mm-dd hh24:mi:ss'))
```

Varchar2

- Datatypes are overrated.
  - They are just fancy integrity constraints after all
  - They won't affect client memory usage at all
  - We'll only put numbers in that string, it'll be just OK

Probably You Should Commit Frequently

Commit Frequently

- Auto Commit is best
  - If I didn't mean for something to be permanent I wouldn't have done it after all!
- Definitely commit frequently to save resources and go faster
  - It won't generate *more redo* would it?
  - It won't generate *more total undo* would it?
  - Log_file_sync (the wait event observed during commit) is something the DBA will tune away for us won't they?

Commit Frequently

- My code won't fail:

```
For x in (select * from t1)
Loop
    insert into t2 values ..;
    cnt := cnt + 1;
    if (mod(cnt,100)=0)
    then
        commit;
    end if;
End loop;
```

- So we don't need to make it restartable or anything

Probably You Should Be Database Independent

The Promise

- Write Once
- Deploy Everywhere on anything
- Less Work overall

The Reality

- Write Once
  - For each database
  - They are different
- Deploy Everywhere on anything

- Less Work overall

The Reality

- Write Once
  - For each database
  - They are different
- Deploy Everywhere on anything
  - Deploy on specific dot releases
  - Of specific databases
  - On certain platforms
  - (it is a support issue)
- Less Work overall

The Reality

- Write Once
  - For each database
  - They are different
- Deploy Everywhere on anything
  - Deploy on specific dot releases
  - Of specific databases
  - On certain platforms
  - (it is a support issue)
- Less Work overall
  - More work overall

Probably You Do Not Need Configuration Management Of Any Sort

We probably do not need CM

- Database code isn't really code after all
  - It is a bunch of scripts
  - Scripts are not *code* really, they are something less than code
  - No need to keep track of the
    - Grants, Creates, Alters and so on…
  - Besides, we can probably just get it from the data dictionary
  - Because the scratch test database we develop on is maintained just like a production instance is!

We probably do not need CM

- “Diffing” databases to see what’s different schema wise to do application updates
  - Is completely acceptable
  - Very professional
  - Makes it easier to document
  - Leads to much better designs
  - You don’t really need to know what is changing between version 1 and 2

Probably You Do Not Need To Design To Be Scalable

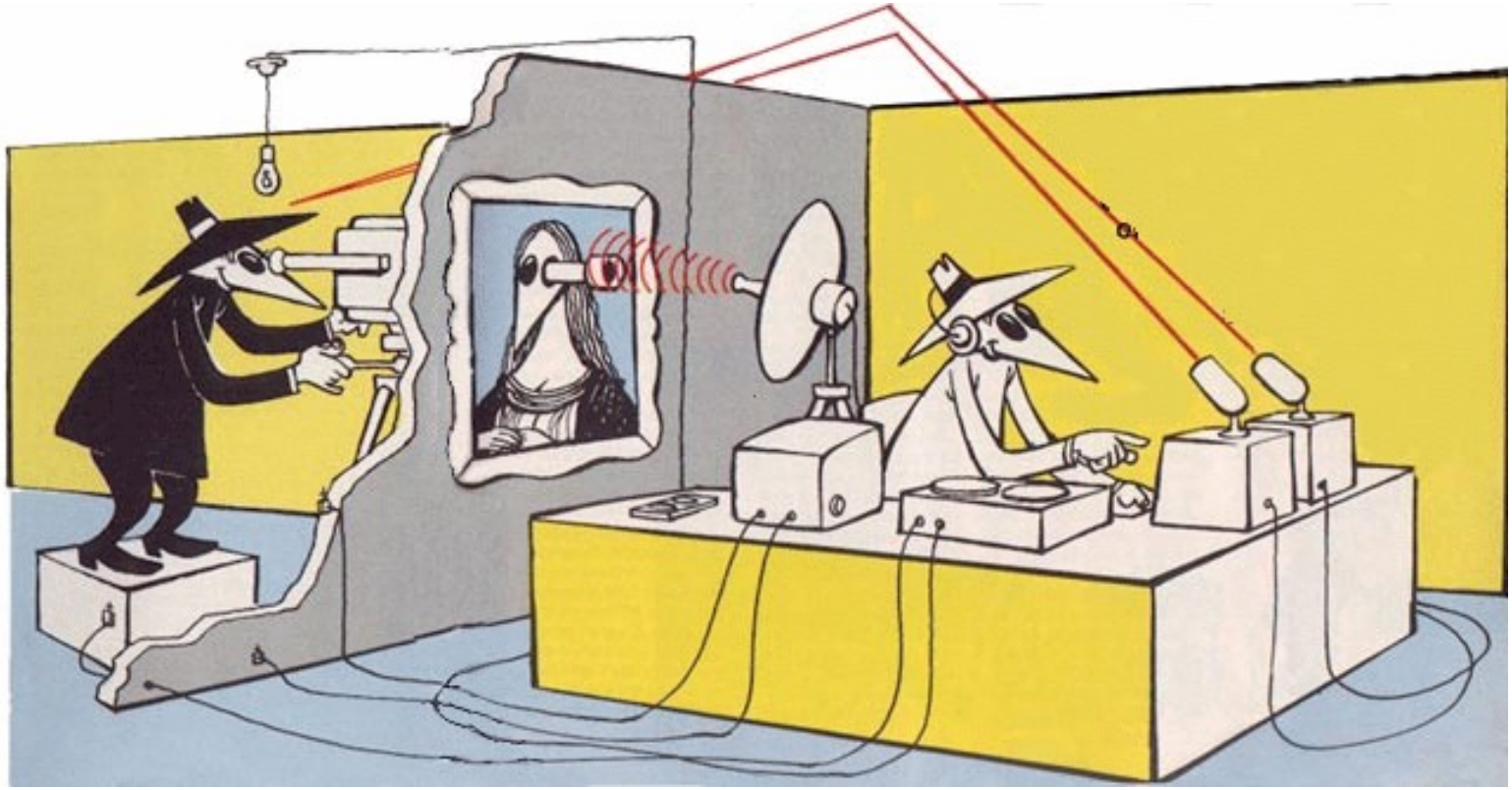
Scalability

- Scalability just happens
- Oracle is very scalable
  - Therefore, so shall ye be scalable
- It is a *shared pool* – we all just share it together
  - Contention free
- This is really why you probably do not need to test
- Besides, you can just add more
  - CPU
  - Memory
  - Disk

Probably
You do not need to design to be secure

DBAs And Developers Are Just Different, So Get Over It

DBA vs Developer vs DBA



The Job of the DBA is…

- Priority #1 is to protect the database from the developers
- Outlaw features, they might be mis-used
  - Views, had a bad experience with a view once…
  - Stored procedures, they just use CPU
  - Any feature added after version 6
  - No feature can be used until it is at least 5 versions old – software is just like fine wine

The Job of the DBA is…

- It is not your job to educate
- Just say *no.* You need not explain why, you are the DBA after all.
- These are perfectly valid reasons to avoid using a database feature:
  - "I heard it was slow"
  - "I've heard it is buggy"

Developers

- It is true, the DBA is not there to work with you
- Try to find ways to avoid having to work with them, such as..
  - Don't ask any questions
  - Do as much as you can outside of the database
- Do not join, you can write code to do that
- Do not use database features, you can write code to do that
- Do not use integrity constraints in the database, you can write code to do that
- Try to be as generic and general purpose as possible
- And remember – the DBA is responsible for performance, scalability, and security. You are not.

WARNING

- If you are reading this, without having it presented to you by me (Tom Kyte)…. Please remember, this is tongue in cheek – these are worst practices!!!!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