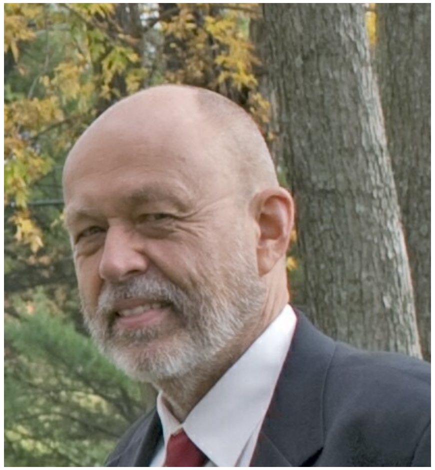
Informix Sysmaster Database Queries for Monitoring and Performance Tuning by Lester Knutsen



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Informix Tech Talks by the IIUG

Thursday, 2/2/2023, 2:00 pm EST

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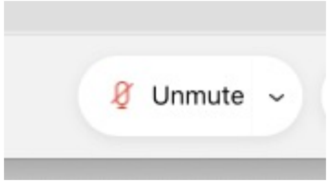
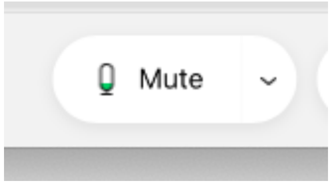
- **Please Mute your line.** Background sounds will distract everyone
- **Use the Chat Button** to ask questions





Lester Knutsen - Retired

Lester Knutsen was President of Advanced DataTools Corporation and has been building and managing Informix databases systems since 1983. Lester is retired but continues sometimes to teach Informix classes and provide Performance Tuning consulting. Lester is an Informix IBM Lifetime Champion. Lester was one of the founders of the Washington Area Informix User Group and the International Informix Users Group.

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Agenda – My favorite Sysmaster Scripts

1. What are basic Server Performance Ratios?
2. What is the performance of your Checkpoints?
3. What is the performance of your Logical Logs? Estimate usages for High Availability?
4. What is the performance of your Dbspaces? And Chunks?
5. What is the performance of your tables? Most used? Least used? Most Sequential Scans? Most wasted space?
6. What indexes are used and not used?
7. How do you monitor AUS and Update Statistics and when were they last run?
8. What are the most Costly SQL queries running?

Favorite Sysmaster Scripts

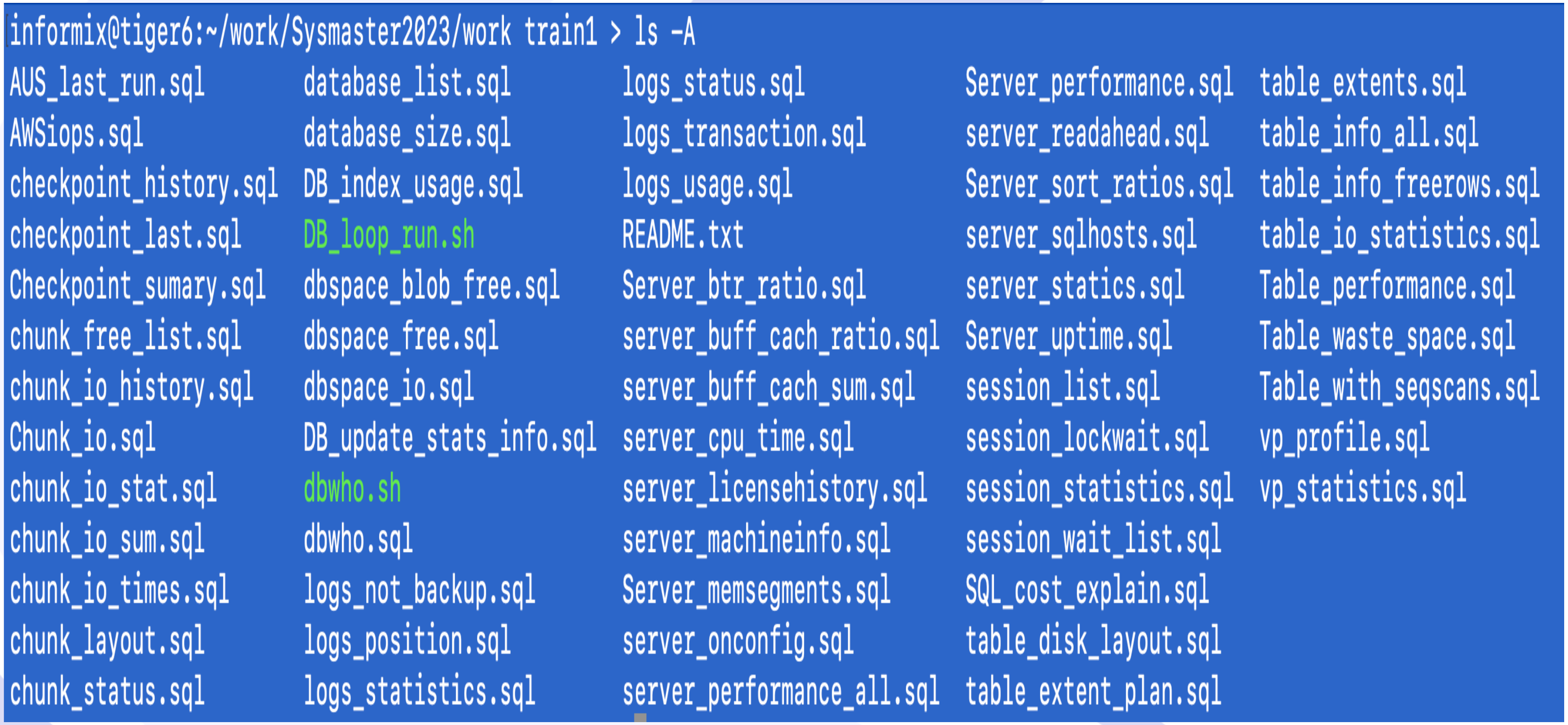
Download all 58 scripts at:

https://advancedatatools.com/Downloads/Sysmaster2023.zip

OR

https://advancedatatools.com/tech-info/tech-sysmaster/

Sysmaster Scripts



```
informix@tiger6:~/work/Sysmaster2023/work train1 > ls -A
AUS_last_run.sql        database_list.sql         logs_status.sql             Server_performance.sql  table_extents.sql
AWSiops.sql             database_size.sql         logs_transaction.sql        server_readahead.sql    table_info_all.sql
checkpoint_history.sql  DB_index_usage.sql        logs_usage.sql              Server_sort_ratios.sql  table_info_freerows.sql
checkpoint_last.sql     DB_loop_run.sh            README.txt                  server_sqlhosts.sql     table_io_statistics.sql
Checkpoint_sumary.sql   dbspace_blob_free.sql     Server_btr_ratio.sql        server_statics.sql      Table_performance.sql
chunk_free_list.sql     dbspace_free.sql          server_buff_cach_ratio.sql  Server_uptime.sql       Table_waste_space.sql
chunk_io_history.sql    dbspace_io.sql            server_buff_cach_sum.sql    session_list.sql        Table_with_seqscans.sql
Chunk_io.sql            DB_update_stats_info.sql  server_cpu_time.sql         session_lockwait.sql    vp_profile.sql
chunk_io_stat.sql       dbwho.sh                  server_licensehistory.sql   session_statistics.sql  vp_statistics.sql
chunk_io_sum.sql        dbwho.sql                 server_machineinfo.sql      session_wait_list.sql
chunk_io_times.sql      logs_not_backup.sql       Server_memsegments.sql      SQL_cost_explain.sql
chunk_layout.sql        logs_position.sql         server_onconfig.sql         table_disk_layout.sql
chunk_status.sql        logs_statistics.sql       server_performance_all.sql  table_extent_plan.sql
```

Disclaimer

- All scripts are experimental
- Use at your own risk
- Still under test and development
- Tested on 14.10.FC3-9 and 12.10.FC15
- May need to be updated in the future releases

Past Presentations

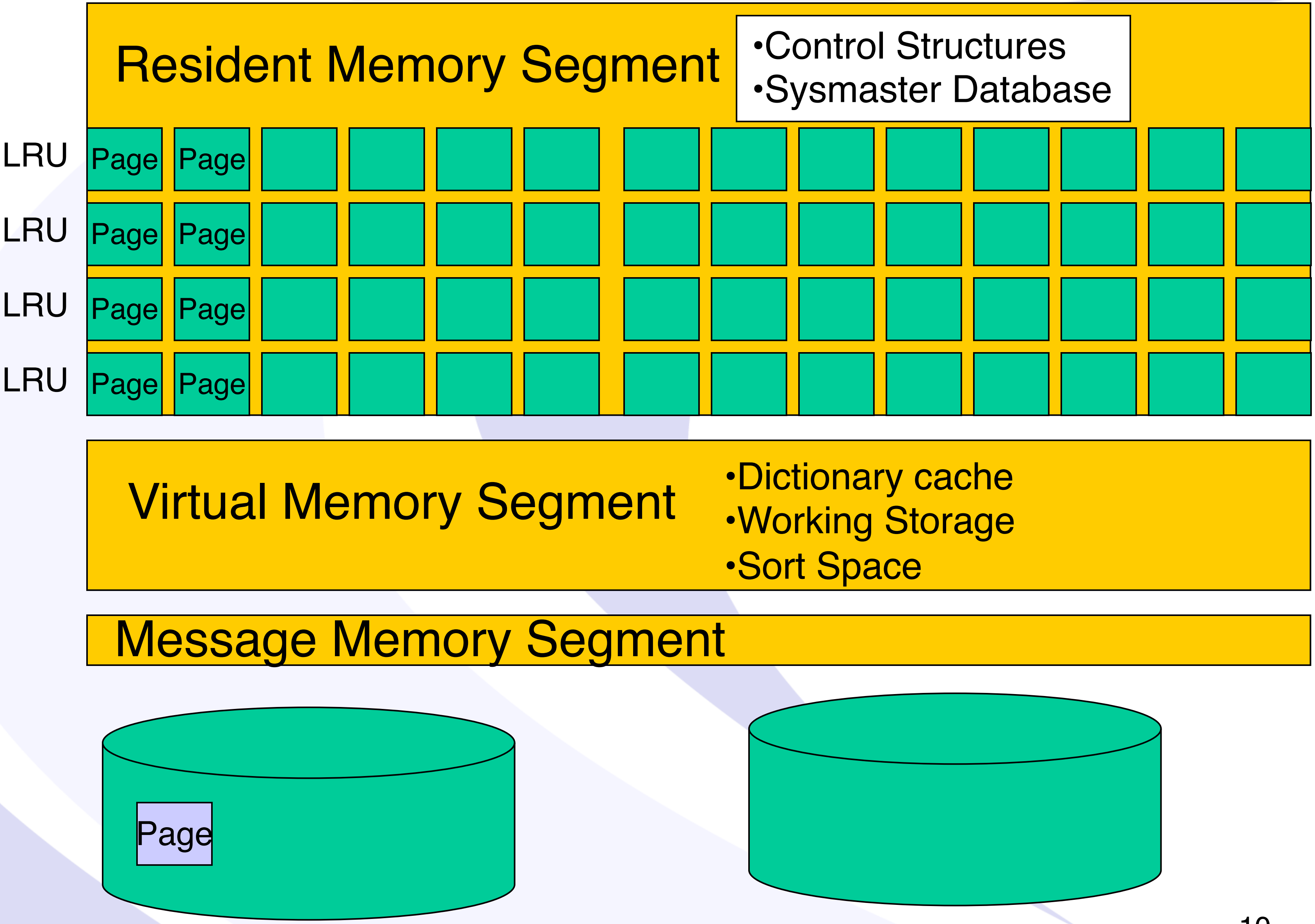
- Informix Performance Tuning Using the Sysmaster Database
  - https://advancedatatools.com/tech-info/tech-sysmaster/
- Informix Conference 2019, 2017, 2016,…. 1997
- Webcasts Replays on our website

What is the Sysmaster Database?

A database that peeks into
the shared memory structures
of an INFORMIX-Dynamic Server

Script to create the Sysmaster Database:
$INFORMIXDIR/etc/sysmaster.sql

Informix Control Structures in Memory are the Sysmaster Database



Sysmaster Database Contains:

- Server information
- Dbspace & chunk information
- Database & table information
- User session information
- Currently running SQL

Performance of Queries on Sysmaster Database

The data is in shared memory but:

- Views used by tables require disk access and may be slow
- Complex views used to hide complex data
- Some tables are large (million locks)
- Unbuffered logging of temp tables

Differences from Other Databases

- Do not update Sysmaster tables as this may corrupt the server
- Cannot use dbschema on pseudo tables
- Cannot drop pseudo tables or the Sysmaster Database

Isolation Level is Dirty Read

- Data is dynamic and can change as you retrieve it (Dirty Read)
- Dynamic nature may return inconsistent results
- However, it uses Unbuffered logging and temp tables are logged

Sysmaster Database will Change

- Some undocumented tables and columns may change in future versions
- Scripts in this presentation using undocumented features may not work on all versions of Informix
- New scripts have been run on versions 12.10 and 14.10.FC1-FC9
- Sysmaster upgrades in 14.10.FC2

Sever Performance Scripts

- server_uptime.sql
- AWSiops.sql
- server_btr_ratio.sql
- server_memsegments.sql
- server_performance_all.sql
- server_performance.sql
- server_sort_ratios.sql

How do you measure the time since the Server Statistics have been reset?

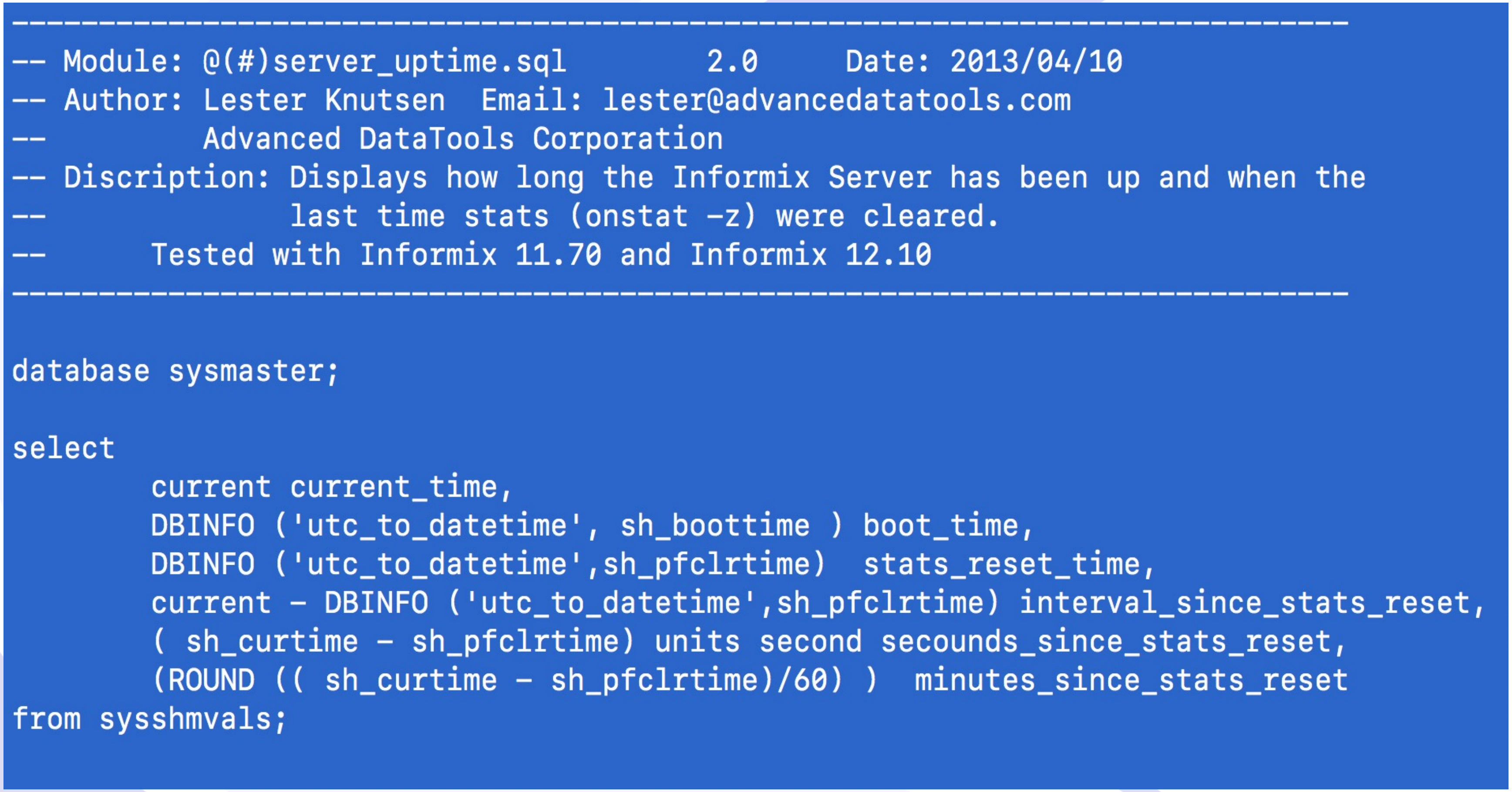
Required for Performance Ratios

Important undocumented table – Sysshmvals*

sh_mode	int,	turbo mode number
sh_boottime	int,	boot time of day
sh_pfclrtime	int,	time profilers were last clr
sh_curtime	int,	current mt_time
sh_bootstamp	int,	boot time stamp
sh_stamp	int,	current time stamp
sh_mainlooptcb	int,	address of main thread
sh_sysflags	int,	system operating flags
sh_maxchunks	int,	size of chunk table
sh_maxdbspaces	int,	size of dbspace table
sh_maxuserthreads	int,	max # of user structures
sh_maxtrans	int,	max # of trans structures
sh_maxlocks	int,	# of locks total
sh_maxlogs	int,	size of log table
sh_nbuffs	int,	# of buffers total
sh_pagesize	int,	buffer size in bytes
sh_nlrus	int,	# of lru queues
sh_maxdirty	float,	LRU max % dirty pages
sh_mindirty	float,	LRU min % dirty pages
sh_ncleaners	int,	# of cleaning/flushing procs
sh_longtx	int,	# the long transaction flag

sh_optstgbsnum	int,	subsystem Blobspace
sh_cpflag	int,	TRUE => doing checkpoint
sh_rapages	int,	# pages to read ahead
sh_rathreshold	int,	# to start next read ahead
sh_lastlogfreed	int,	last log (id) written to tape
sh_rmdlktout	int,	max timeout when distributed
sh_narchivers	int,	number of active archives
sh_maxpdqpriority	int,	max pdqpriority
sh_fuzcpflag	int,	fuzzy checkpoint flag
sh_needcpsyn	int,	hard checkpoint
sh_nfuzzy	int,	# buffers marked fuzzy
sh_nfuzzypre	int,	# buffers fuzzy in last ckpt
sh_oldestlsnuq	int,	lsn of oldest update not
sh_oldestlsnpos	int,	flushed to disk
sh_builddpt	int,	builing DPT necessary
sh_ndptentries	int,	# entries in DPT
sh_dptsize	int,	size of DPT
sh_curmaxcons	int,	max #connections in this run
sh_ovlmaxcons	int	max #connections to server

When were the Statistics Cleared?

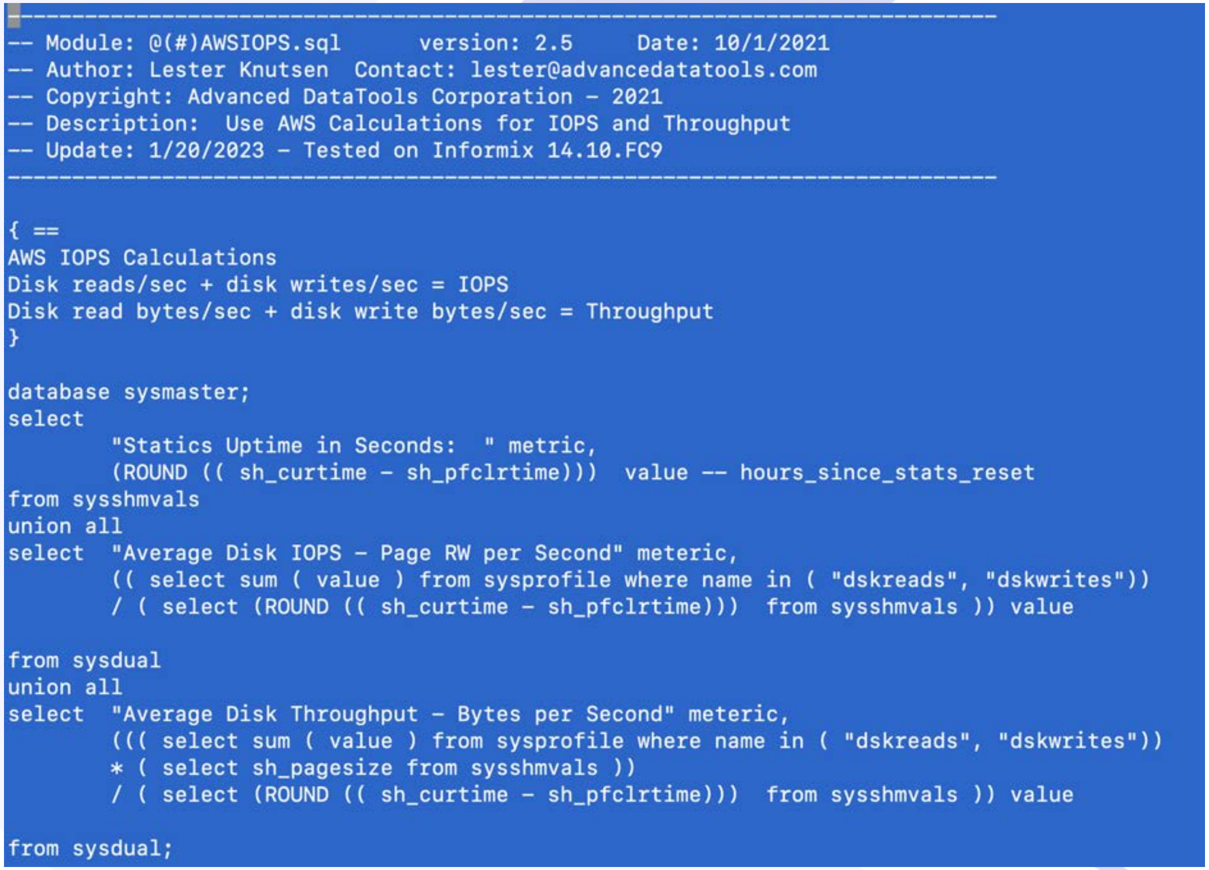


```
------------------------------------------------------------------------------
-- Module: @(#)server_uptime.sql        2.0     Date: 2013/04/10
-- Author: Lester Knutsen  Email: lester@advancedatatools.com
--         Advanced DataTools Corporation
-- Discription: Displays how long the Informix Server has been up and when the
--              last time stats (onstat -z) were cleared.
--      Tested with Informix 11.70 and Informix 12.10
------------------------------------------------------------------------------

database sysmaster;

select
        current current_time,
        DBINFO ('utc_to_datetime', sh_boottime ) boot_time,
        DBINFO ('utc_to_datetime',sh_pfclrtime)  stats_reset_time,
        current - DBINFO ('utc_to_datetime',sh_pfclrtime) interval_since_stats_reset,
        ( sh_curtime - sh_pfclrtime) units second secounds_since_stats_reset,
        (ROUND (( sh_curtime - sh_pfclrtime)/60) )  minutes_since_stats_reset
from sysshmvals;
```

AWS Calculations for IOPS and Throughput



```
-----------------------------------------------------------------------------
-- Module: @(#)AWSIOPS.sql      version: 2.5     Date: 10/1/2021
-- Author: Lester Knutsen  Contact: lester@advancedatatools.com
-- Copyright: Advanced DataTools Corporation - 2021
-- Description:  Use AWS Calculations for IOPS and Throughput
-- Update: 1/20/2023 - Tested on Informix 14.10.FC9
-----------------------------------------------------------------------------

{ ==
AWS IOPS Calculations
Disk reads/sec + disk writes/sec = IOPS
Disk read bytes/sec + disk write bytes/sec = Throughput
}

database sysmaster;
select
        "Statics Uptime in Seconds:  " metric,
        (ROUND (( sh_curtime - sh_pfclrtime)))  value -- hours_since_stats_reset
from sysshmvals
union all
select  "Average Disk IOPS - Page RW per Second" meteric,
        (( select sum ( value ) from sysprofile where name in ( "dskreads", "dskwrites"))
        / ( select (ROUND (( sh_curtime - sh_pfclrtime)))  from sysshmvals )) value

from sysdual
union all
select  "Average Disk Throughput - Bytes per Second" meteric,
        ((( select sum ( value ) from sysprofile where name in ( "dskreads", "dskwrites"))
        * ( select sh_pagesize from sysshmvals ))
        / ( select (ROUND (( sh_curtime - sh_pfclrtime)))  from sysshmvals )) value

from sysdual;
```

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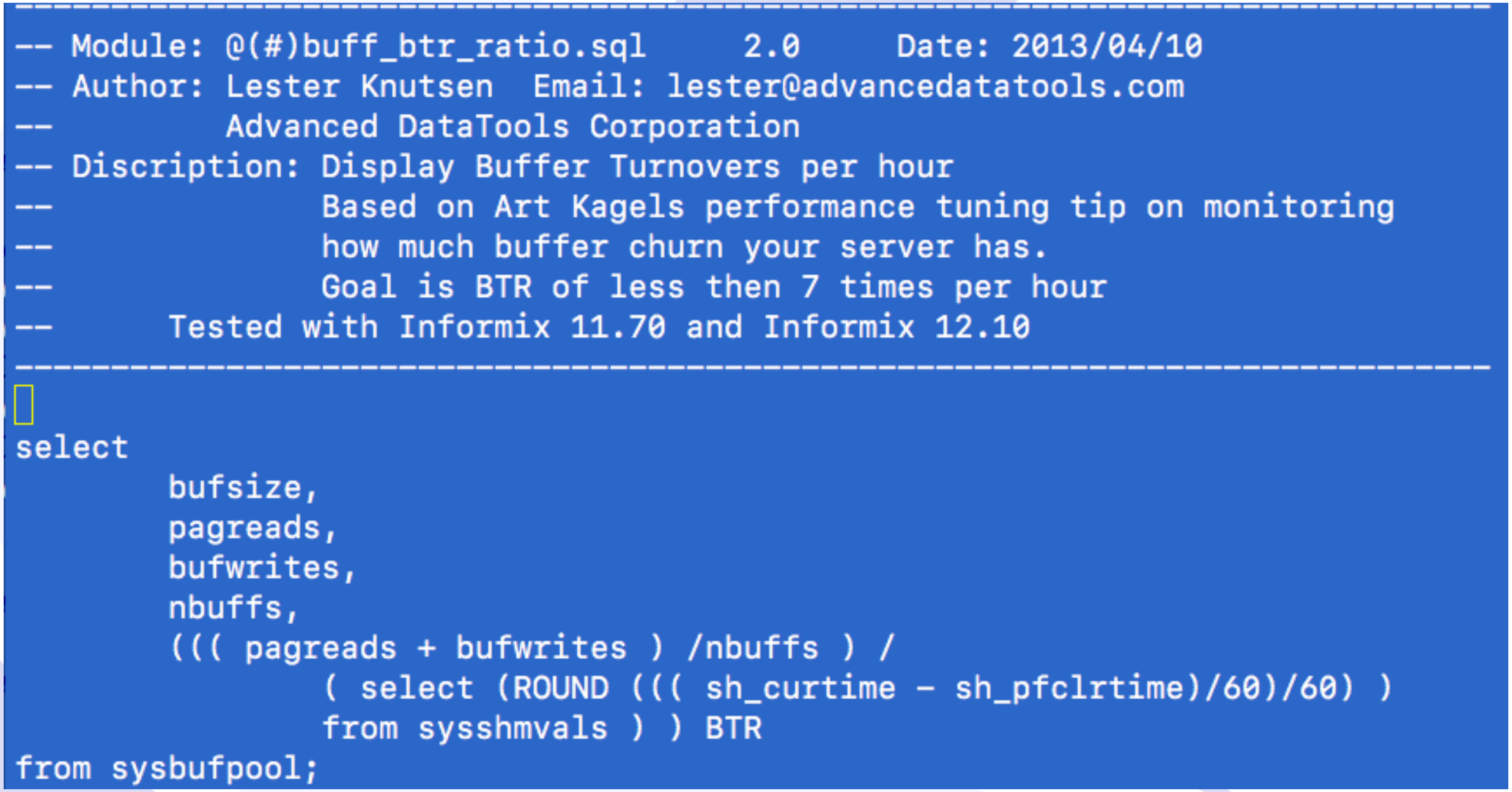
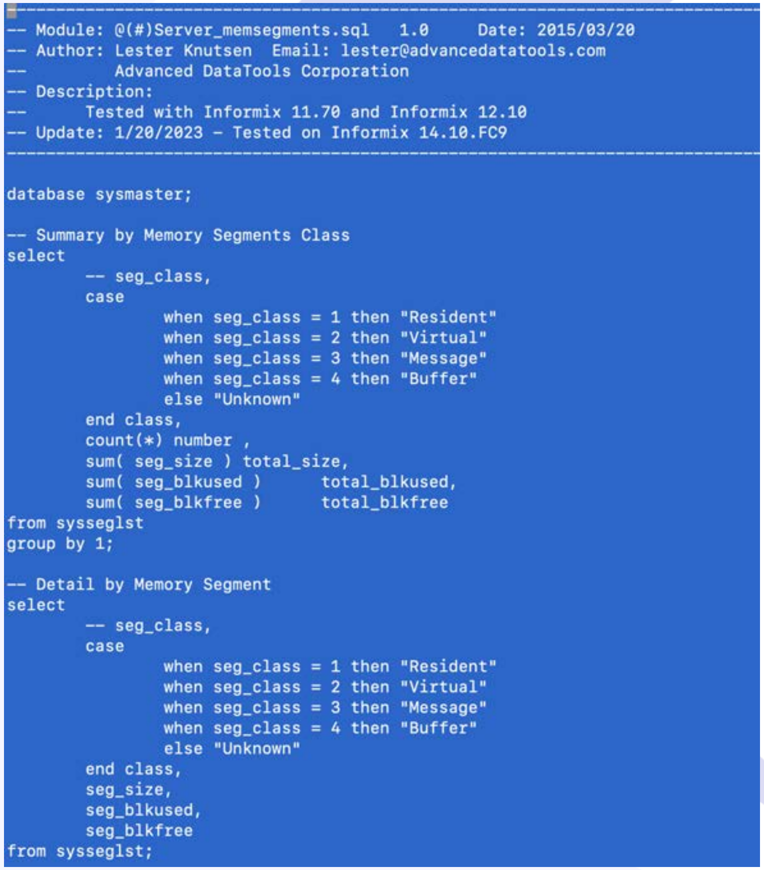
Monitoring BUFFERPOOL Turnover



```
-----------------------------------------------------------------------------
-- Module: @(#)buff_btr_ratio.sql     2.0     Date: 2013/04/10
-- Author: Lester Knutsen  Email: lester@advancedatatools.com
--         Advanced DataTools Corporation
-- Discription: Display Buffer Turnovers per hour
--              Based on Art Kagels performance tuning tip on monitoring
--              how much buffer churn your server has.
--              Goal is BTR of less then 7 times per hour
--      Tested with Informix 11.70 and Informix 12.10
-----------------------------------------------------------------------------

select
        bufsize,
        pagreads,
        bufwrites,
        nbuffs,
        ((( pagreads + bufwrites ) /nbuffs ) /
                ( select (ROUND ((( sh_curtime - sh_pfclrtime)/60)/60) )
                from sysshmvals ) ) BTR
from sysbufpool;
```

Show Memory Usages by Segment



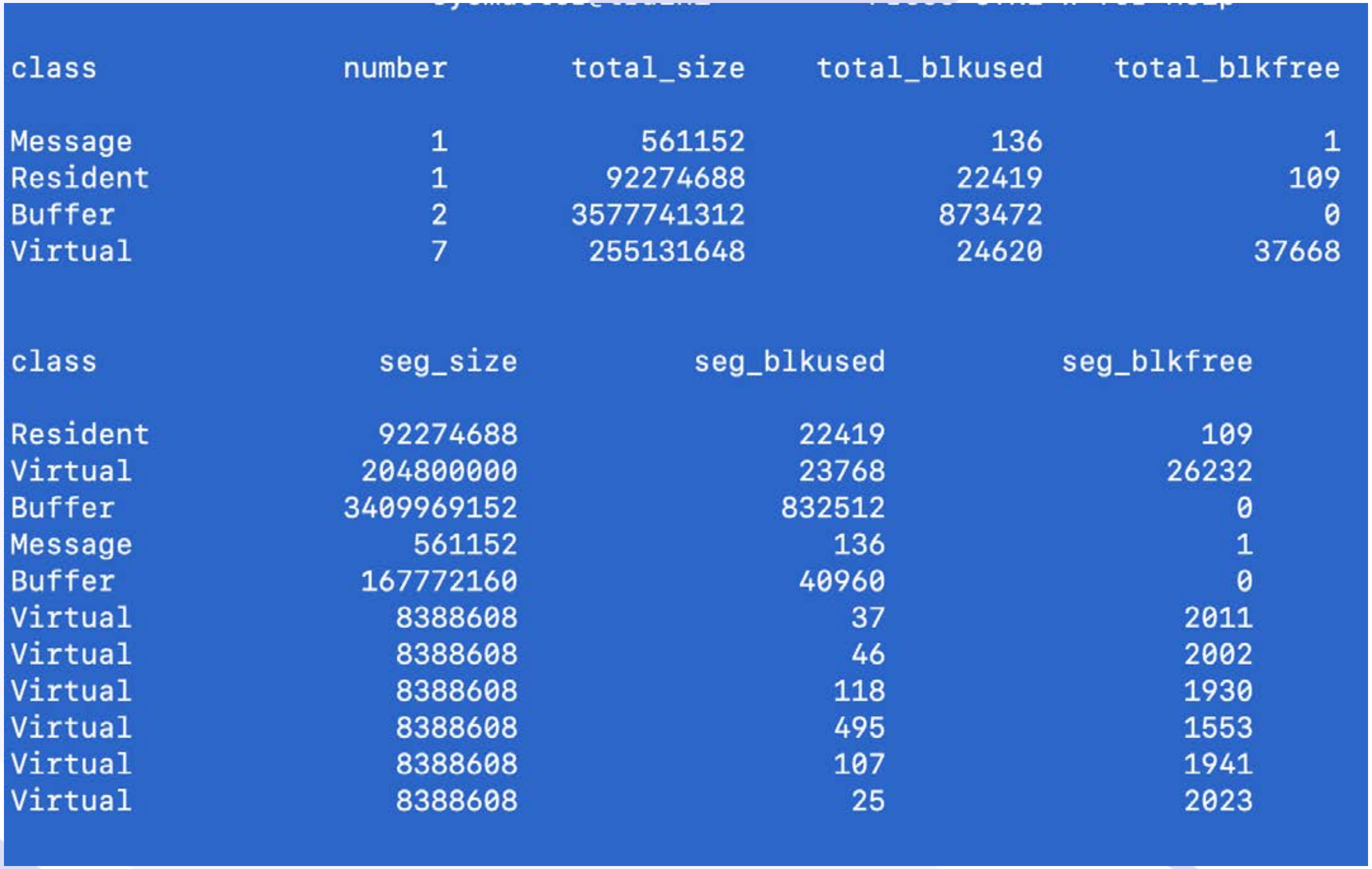
```
-----------------------------------------------------------------------------
-- Module: @(#)Server_memsegments.sql   1.0     Date: 2015/03/20
-- Author: Lester Knutsen  Email: lester@advancedatatools.com
--         Advanced DataTools Corporation
-- Description:
--      Tested with Informix 11.70 and Informix 12.10
-- Update: 1/20/2023 - Tested on Informix 14.10.FC9
-----------------------------------------------------------------------------

database sysmaster;

-- Summary by Memory Segments Class
select
        -- seg_class,
        case
                when seg_class = 1 then "Resident"
                when seg_class = 2 then "Virtual"
                when seg_class = 3 then "Message"
                when seg_class = 4 then "Buffer"
                else "Unknown"
        end class,
        count(*) number ,
        sum( seg_size ) total_size,
        sum( seg_blkused )      total_blkused,
        sum( seg_blkfree )      total_blkfree
from sysseglst
group by 1;

-- Detail by Memory Segment
select
        -- seg_class,
        case
                when seg_class = 1 then "Resident"
                when seg_class = 2 then "Virtual"
                when seg_class = 3 then "Message"
                when seg_class = 4 then "Buffer"
                else "Unknown"
        end class,
        seg_size,
        seg_blkused,
        seg_blkfree
from sysseglst;
```

Show Memory Usages by Segment



```
class               number      total_size   total_blkused    total_blkfree

Message                  1          561152             136                1
Resident                 1        92274688           22419              109
Buffer                   2      3577741312          873472                0
Virtual                  7       255131648           24620            37668


class                   seg_size              seg_blkused              seg_blkfree

Resident                92274688                    22419                      109
Virtual                204800000                    23768                    26232
Buffer                3409969152                   832512                        0
Message                   561152                      136                        1
Buffer                 167772160                    40960                        0
Virtual                  8388608                       37                     2011
Virtual                  8388608                       46                     2002
Virtual                  8388608                      118                     1930
Virtual                  8388608                      495                     1553
Virtual                  8388608                      107                     1941
Virtual                  8388608                       25                     2023
```

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Server Preformance Ratios Dashboard

- Goal – One SQL Script to Show a Status of the Server
  - server_performance_all.sql - Displays key server profile/performance ratios
- Based on a Union of 20 SQL Scripts

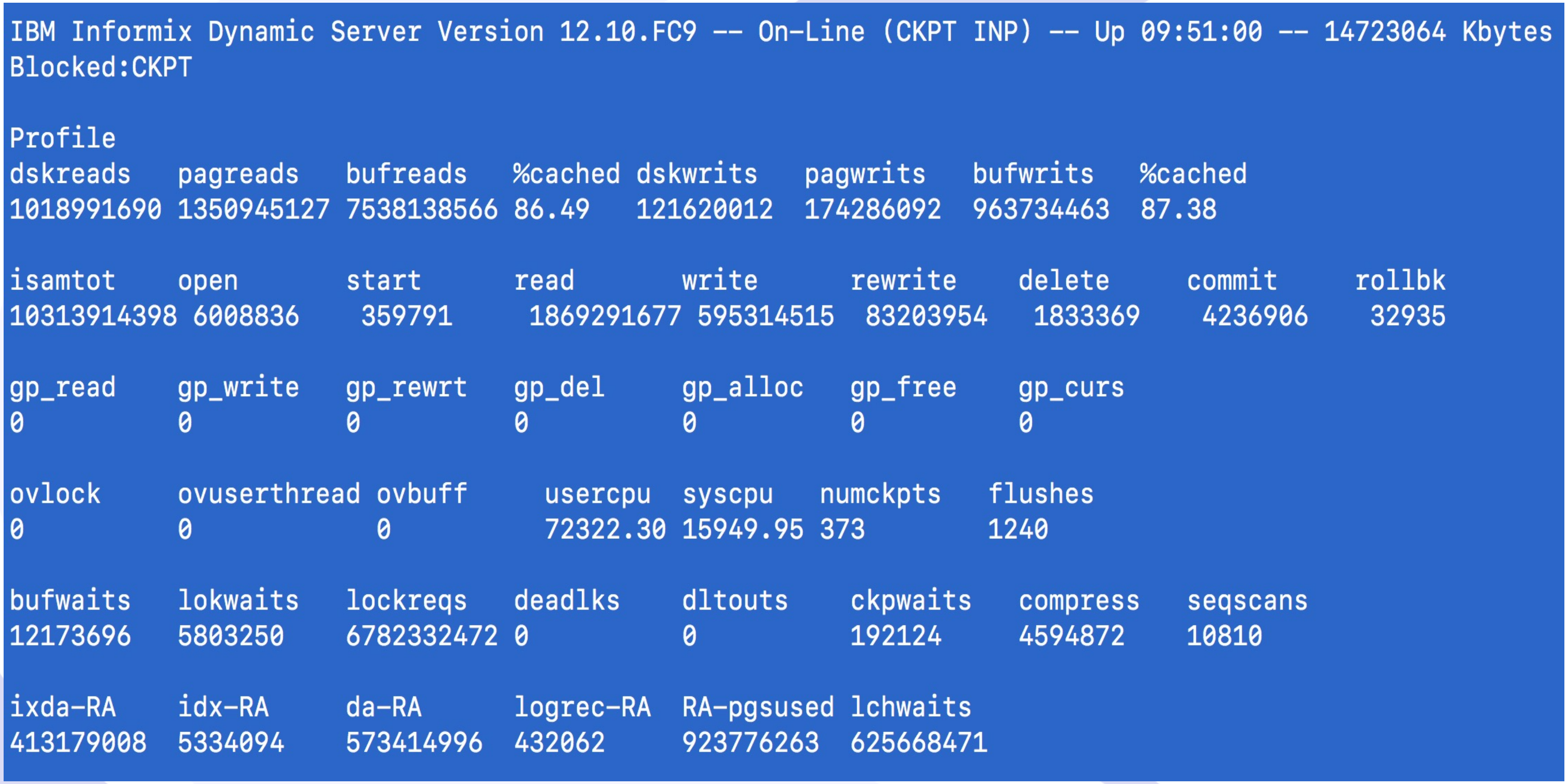
Sysprofile (onstat -p)

View sysprofile: Current statistics and performance information of the server.

```
name          char(32),   --profile element name
value         int8        --current value
```

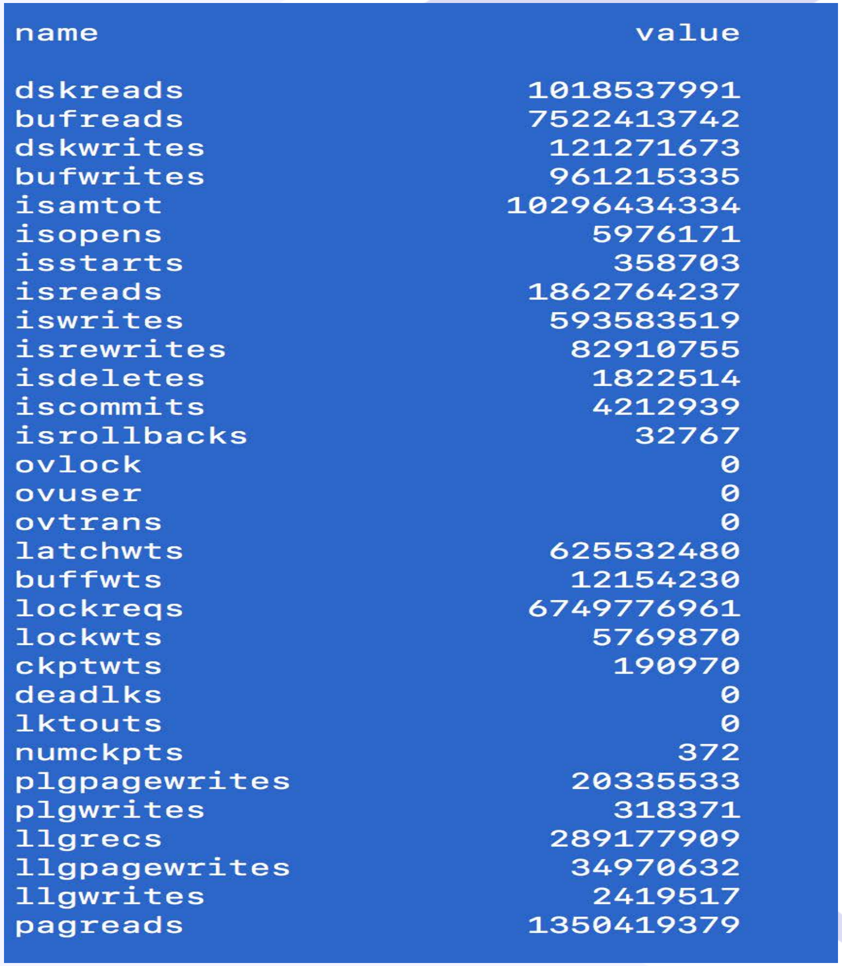
The values are re-set to 0 when Informix is shutdown and started and when the command “onstat -z” is used.

Sysprofile = onstat -p



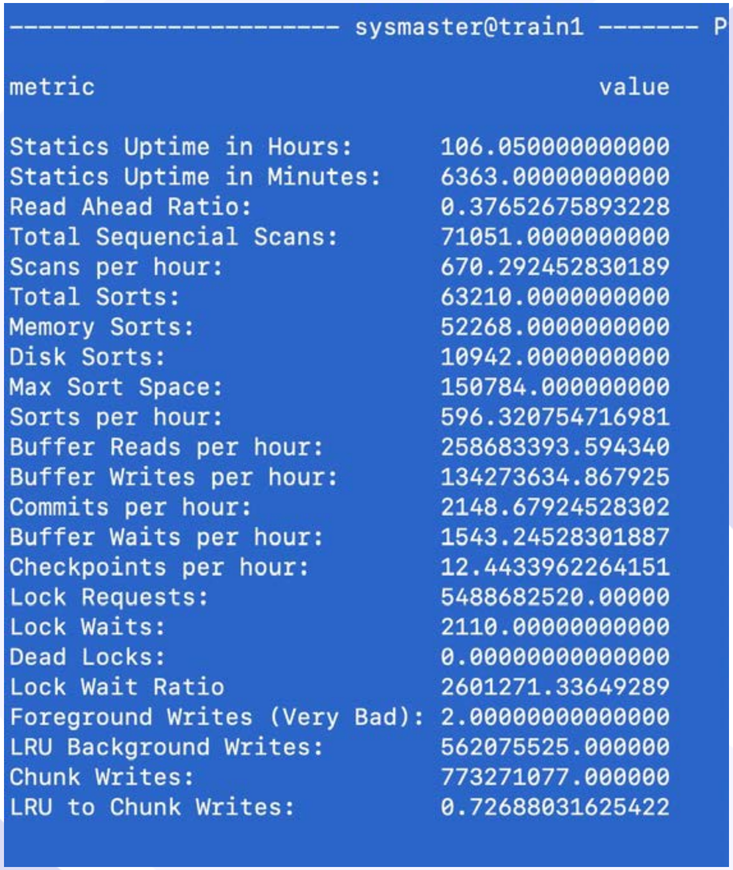
```
IBM Informix Dynamic Server Version 12.10.FC9 -- On-Line (CKPT INP) -- Up 09:51:00 -- 14723064 Kbytes
Blocked:CKPT

Profile
dskreads   pagreads   bufreads   %cached dskwrits   pagwrits   bufwrits   %cached
1018991690 1350945127 7538138566 86.49   121620012  174286092  963734463  87.38

isamtot    open       start      read       write      rewrite    delete     commit     rollbk
10313914398 6008836    359791     1869291677 595314515  83203954   1833369    4236906    32935

gp_read    gp_write   gp_rewrt   gp_del     gp_alloc   gp_free    gp_curs
0          0          0          0          0          0          0

ovlock     ovuserthread ovbuff     usercpu  syscpu   numckpts   flushes
0          0            0          72322.30 15949.95 373        1240

bufwaits   lokwaits   lockreqs   deadlks    dltouts    ckpwaits   compress   seqscans
12173696   5803250    6782332472 0          0          192124     4594872    10810

ixda-RA    idx-RA     da-RA      logrec-RA  RA-pgsused lchwaits
413179008  5334094    573414996  432062     923776263  625668471
```

Sysprofile

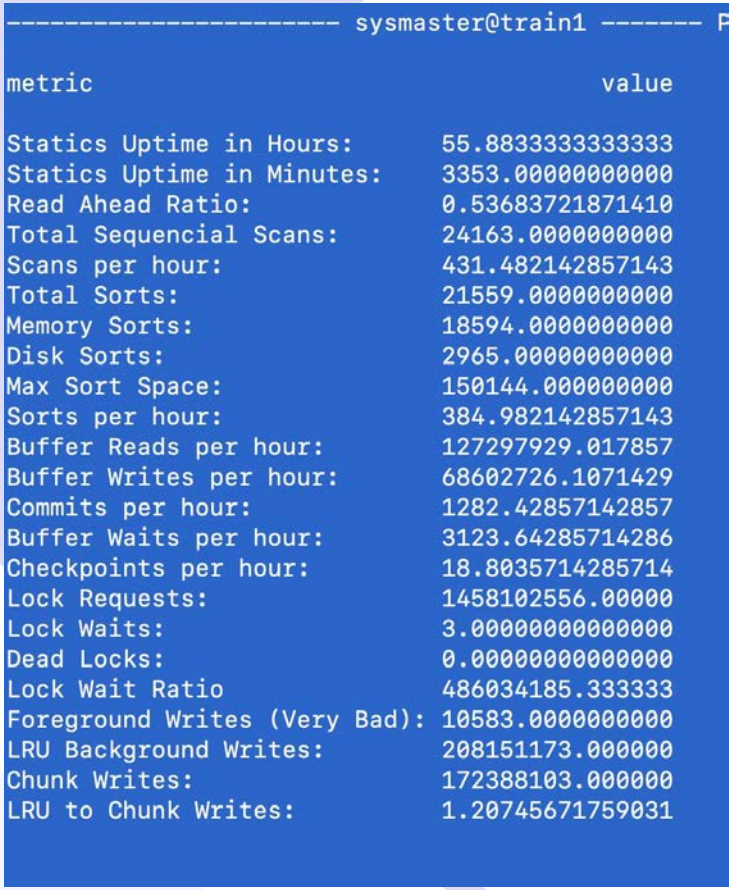


```
name                         value

dskreads                1018537991
bufreads                7522413742
dskwrites                121271673
bufwrites                961215335
isamtot                10296434334
isopens                    5976171
isstarts                    358703
isreads                 1862764237
iswrites                 593583519
isrewrites                82910755
isdeletes                  1822514
iscommits                  4212939
isrollbacks                  32767
ovlock                           0
ovuser                           0
ovtrans                          0
latchwts                 625532480
buffwts                   12154230
lockreqs                6749776961
lockwts                    5769870
ckptwts                     190970
deadlks                          0
lktouts                          0
numckpts                       372
plgpagewrites             20335533
plgwrites                   318371
llgrecs                  289177909
llgpagewrites             34970632
llgwrites                  2419517
pagreads                1350419379
```

Server Ratios Dashboard



```
---------------------- sysmaster@train1 ------- P

metric                                      value

Statics Uptime in Hours:       106.050000000000
Statics Uptime in Minutes:     6363.00000000000
Read Ahead Ratio:              0.37652675893228
Total Sequencial Scans:        71051.0000000000
Scans per hour:                670.292452830189
Total Sorts:                   63210.0000000000
Memory Sorts:                  52268.0000000000
Disk Sorts:                    10942.0000000000
Max Sort Space:                150784.000000000
Sorts per hour:                596.320754716981
Buffer Reads per hour:         258683393.594340
Buffer Writes per hour:        134273634.867925
Commits per hour:              2148.67924528302
Buffer Waits per hour:         1543.24528301887
Checkpoints per hour:          12.4433962264151
Lock Requests:                 5488682520.00000
Lock Waits:                    2110.00000000000
Dead Locks:                    0.00000000000000
Lock Wait Ratio                2601271.33649289
Foreground Writes (Very Bad):  2.00000000000000
LRU Background Writes:         562075525.000000
Chunk Writes:                  773271077.000000
LRU to Chunk Writes:           0.72688031625422
```

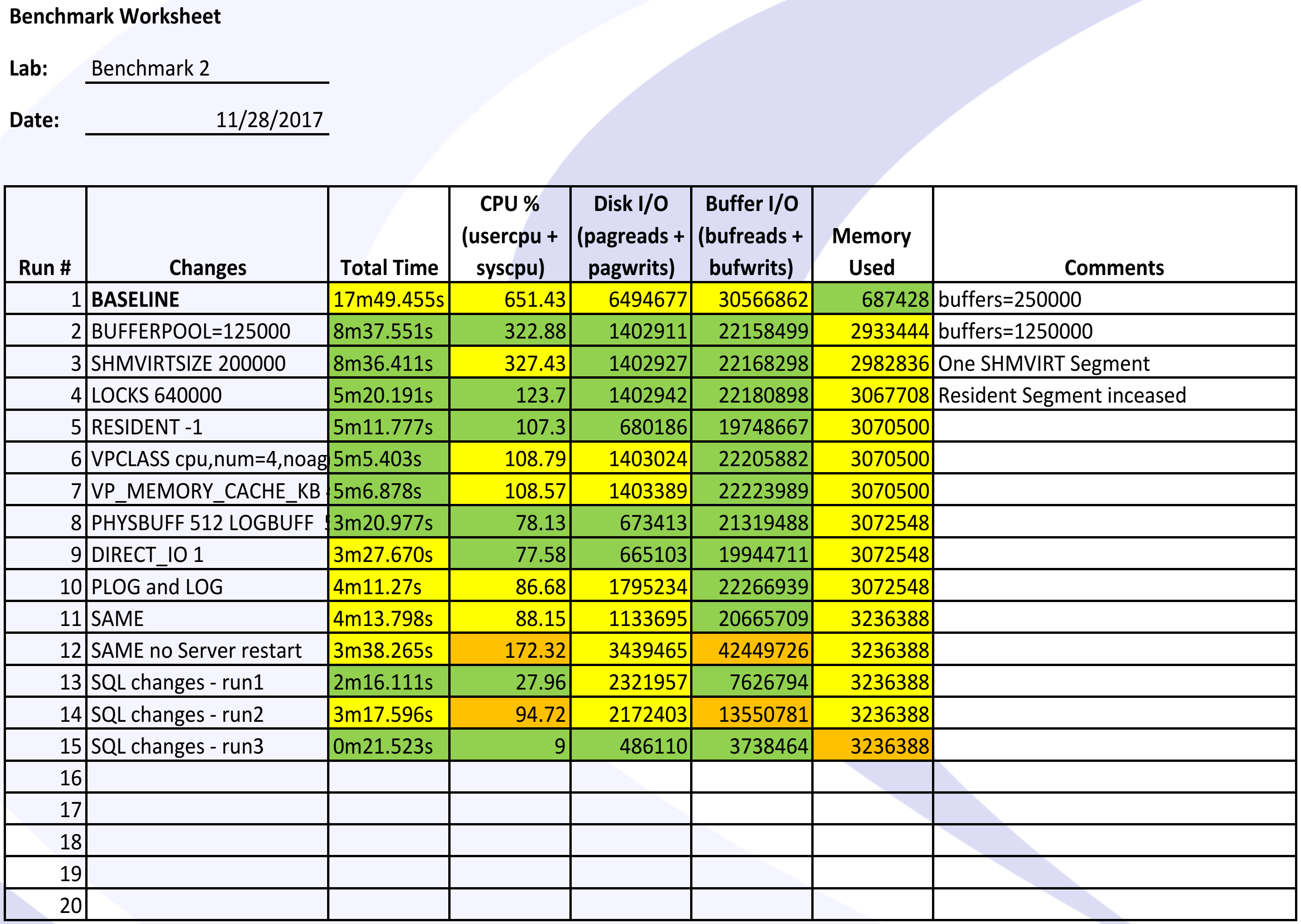


```
---------------------- sysmaster@train1 ------- P

metric                                      value

Statics Uptime in Hours:       55.8833333333333
Statics Uptime in Minutes:     3353.00000000000
Read Ahead Ratio:              0.53683721871410
Total Sequencial Scans:        24163.0000000000
Scans per hour:                431.482142857143
Total Sorts:                   21559.0000000000
Memory Sorts:                  18594.0000000000
Disk Sorts:                    2965.00000000000
Max Sort Space:                150144.000000000
Sorts per hour:                384.982142857143
Buffer Reads per hour:         127297929.017857
Buffer Writes per hour:        68602726.1071429
Commits per hour:              1282.42857142857
Buffer Waits per hour:         3123.64285714286
Checkpoints per hour:          18.8035714285714
Lock Requests:                 1458102556.00000
Lock Waits:                    3.00000000000000
Dead Locks:                    0.00000000000000
Lock Wait Ratio                486034185.333333
Foreground Writes (Very Bad):  10583.0000000000
LRU Background Writes:         208151173.000000
Chunk Writes:                  172388103.000000
LRU to Chunk Writes:           1.20745671759031
```

Scientific Method for Tuning

- **What is the Scientific Method?**
  - Ask a question - Define the Problem
  - Perform research - Observe and Measure
  - Construct a Hypothesis - Plan a Test
  - Test Your Hypothesis - Do an Experiment
  - Analyze Your Data - Draw a Conclusion
  - Communicate Results - Document Results
- **Repeat, Repeat, Repeat**

Benchmark Worksheet



Benchmark Worksheet

Lab: Benchmark 2

Date: 11/28/2017

Run #	Changes	Total Time	CPU % (usercpu + syscpu)	Disk I/O (pagreads + pagwrits)	Buffer I/O (bufreads + bufwrits)	Memory Used	Comments
1	**BASELINE**	17m49.455s	651.43	6494677	30566862	687428	buffers=250000
2	BUFFERPOOL=125000	8m37.551s	322.88	1402911	22158499	2933444	buffers=1250000
3	SHMVIRTSIZE 200000	8m36.411s	327.43	1402927	22168298	2982836	One SHMVIRT Segment
4	LOCKS 640000	5m20.191s	123.7	1402942	22180898	3067708	Resident Segment inceased
5	RESIDENT -1	5m11.777s	107.3	680186	19748667	3070500	
6	VPCLASS cpu,num=4,noag	5m5.403s	108.79	1403024	22205882	3070500	
7	VP_MEMORY_CACHE_KB	5m6.878s	108.57	1403389	22223989	3070500	
8	PHYSBUFF 512 LOGBUFF	3m20.977s	78.13	673413	21319488	3072548	
9	DIRECT_IO 1	3m27.670s	77.58	665103	19944711	3072548	
10	PLOG and LOG	4m11.27s	86.68	1795234	22266939	3072548	
11	SAME	4m13.798s	88.15	1133695	20665709	3236388	
12	SAME no Server restart	3m38.265s	172.32	3439465	42449726	3236388	
13	SQL changes - run1	2m16.111s	27.96	2321957	7626794	3236388	
14	SQL changes - run2	3m17.596s	94.72	2172403	13550781	3236388	
15	SQL changes - run3	0m21.523s	9	486110	3738464	3236388	
16							
17							
18							
19							
20							

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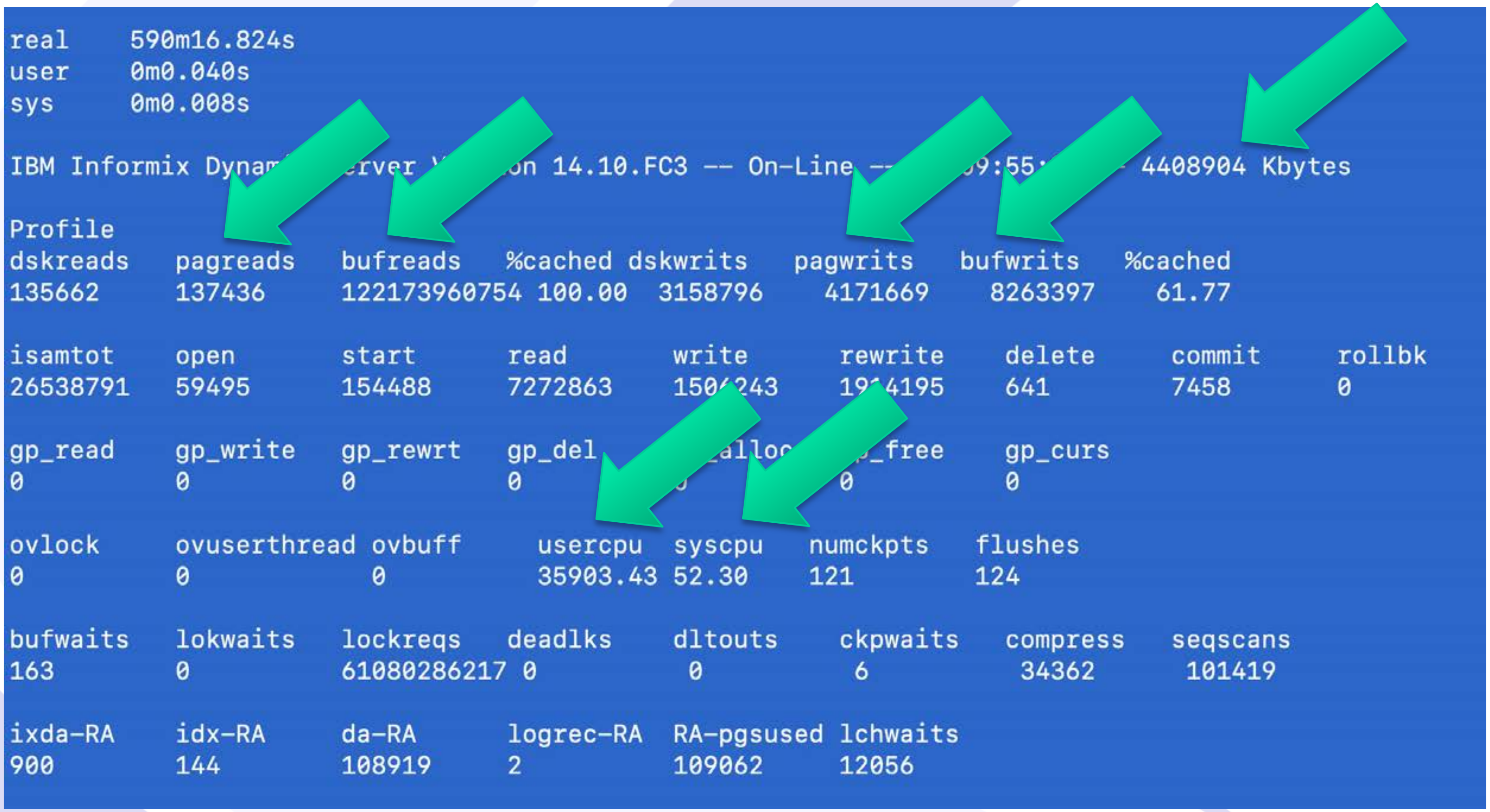
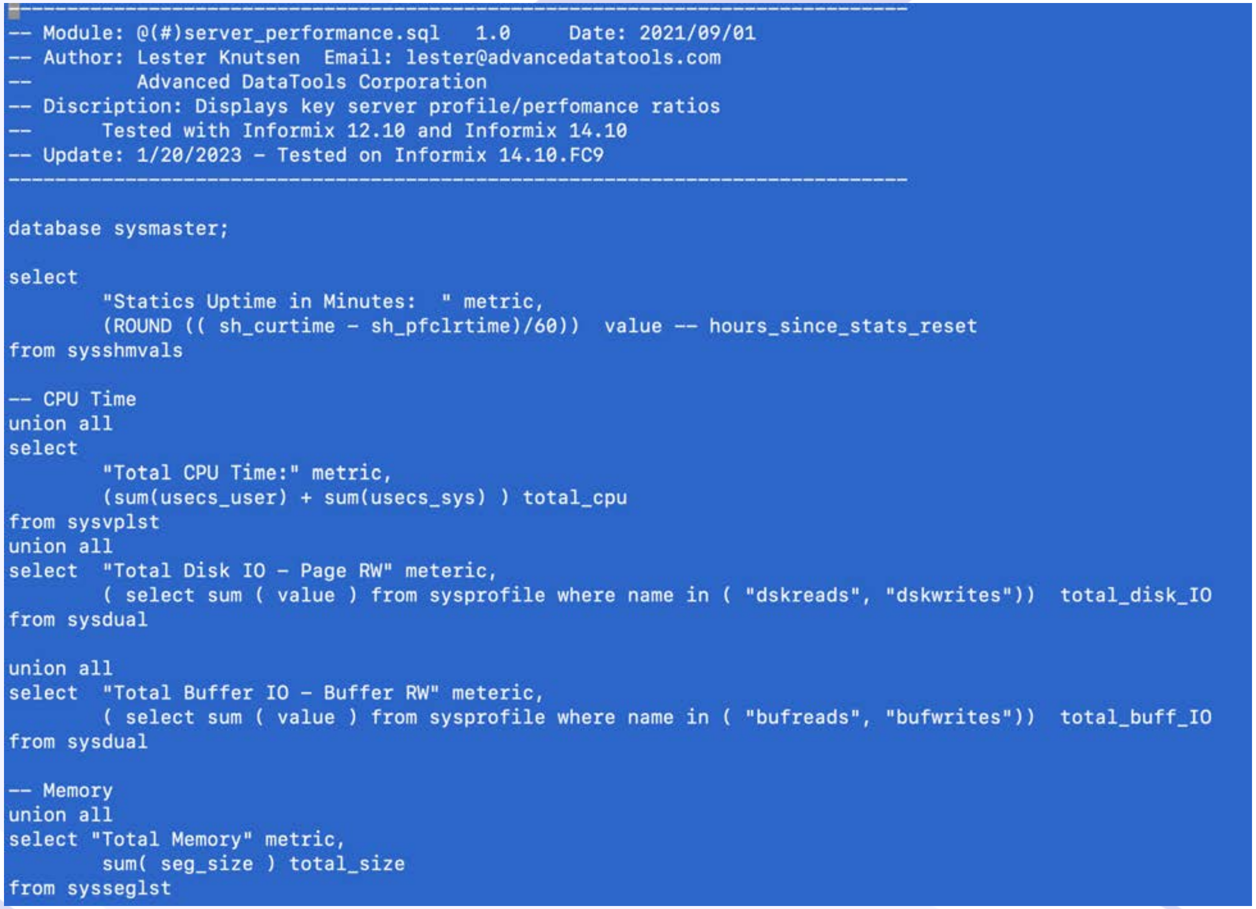
Key Metrics for Tuning



```
real    590m16.824s
user    0m0.040s
sys     0m0.008s

IBM Informix Dynamic Server Version 14.10.FC3 -- On-Line --   09:55:   -- 4408904 Kbytes

Profile
dskreads   pagreads   bufreads   %cached dskwrits   pagwrits   bufwrits   %cached
135662     137436     122173960754 100.00  3158796    4171669    8263397    61.77

isamtot    open       start      read       write      rewrite    delete     commit     rollbk
26538791   59495      154488     7272863    1504243    1914195    641        7458       0

gp_read    gp_write   gp_rewrt   gp_del     gp_alloc   gp_free    gp_curs
0          0          0          0          0          0          0

ovlock     ovuserthread ovbuff     usercpu  syscpu     numckpts   flushes
0          0            0          35903.43 52.30      121        124

bufwaits   lokwaits   lockreqs   deadlks    dltouts    ckpwaits   compress   seqscans
163        0          61080286217 0          0          6          34362      101419

ixda-RA    idx-RA     da-RA      logrec-RA  RA-pgsused lchwaits
900        144        108919     2          109062     12056
```

Displays Selected Server Performance Ratios



```
-----------------------------------------------------------------------------
-- Module: @(#)server_performance.sql   1.0     Date: 2021/09/01
-- Author: Lester Knutsen  Email: lester@advancedatatools.com
--         Advanced DataTools Corporation
-- Discription: Displays key server profile/perfomance ratios
--      Tested with Informix 12.10 and Informix 14.10
-- Update: 1/20/2023 - Tested on Informix 14.10.FC9
-----------------------------------------------------------------------------

database sysmaster;

select
        "Statics Uptime in Minutes:  " metric,
        (ROUND (( sh_curtime - sh_pfclrtime)/60))  value -- hours_since_stats_reset
from sysshmvals

-- CPU Time
union all
select
        "Total CPU Time:" metric,
        (sum(usecs_user) + sum(usecs_sys) ) total_cpu
from sysvplst
union all
select  "Total Disk IO - Page RW" meteric,
        ( select sum ( value ) from sysprofile where name in ( "dskreads", "dskwrites"))  total_disk_IO
from sysdual

union all
select  "Total Buffer IO - Buffer RW" meteric,
        ( select sum ( value ) from sysprofile where name in ( "bufreads", "bufwrites"))  total_buff_IO
from sysdual

-- Memory
union all
select "Total Memory" metric,
        sum( seg_size ) total_size
from sysseglst
```

Advanced DataTools

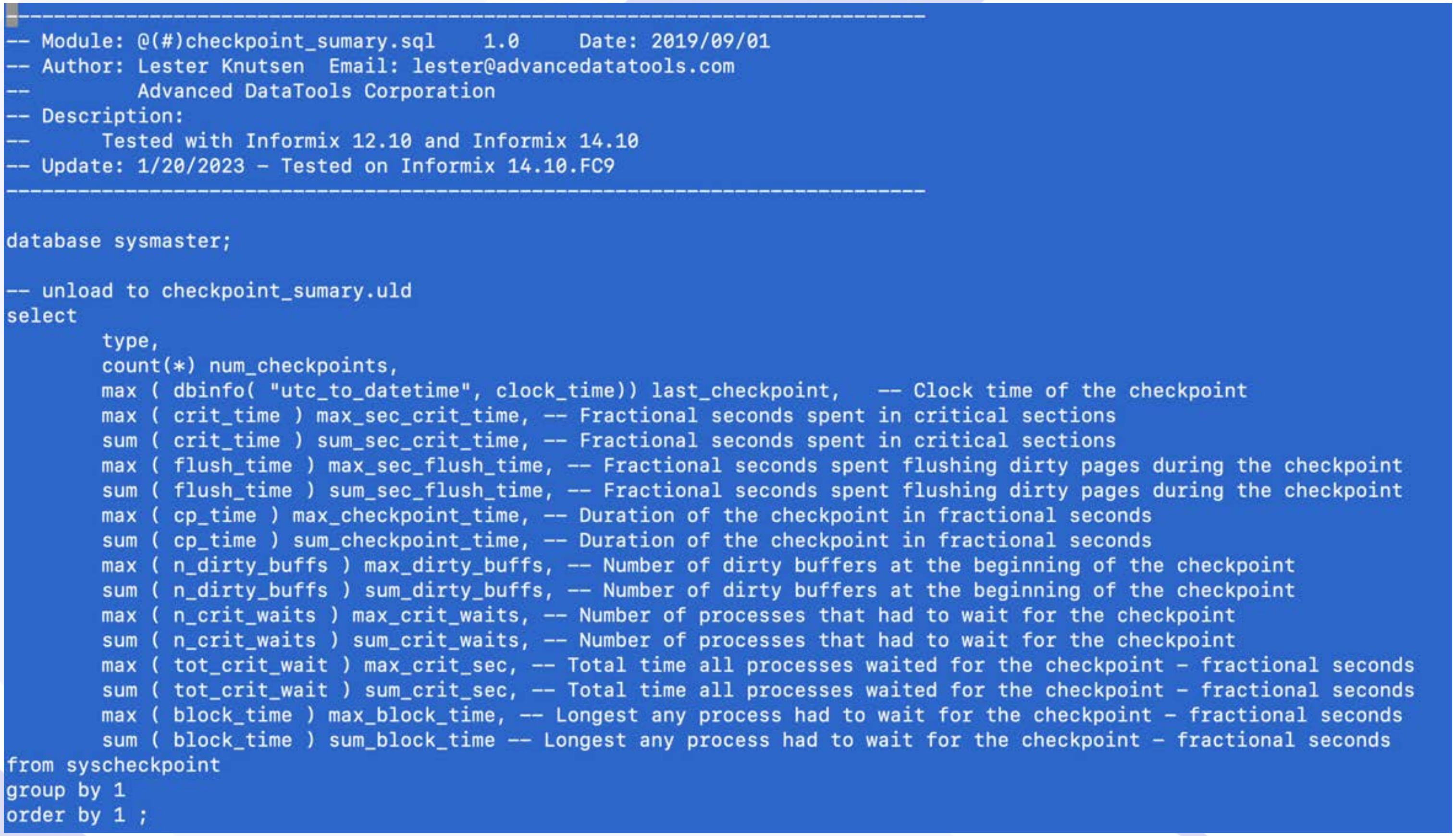
Checkpoints and Logs Performance

- checkpoint_sumary.sql
- logs_not_backup.sql
- logs_usage.sql

Checkpoint Performance

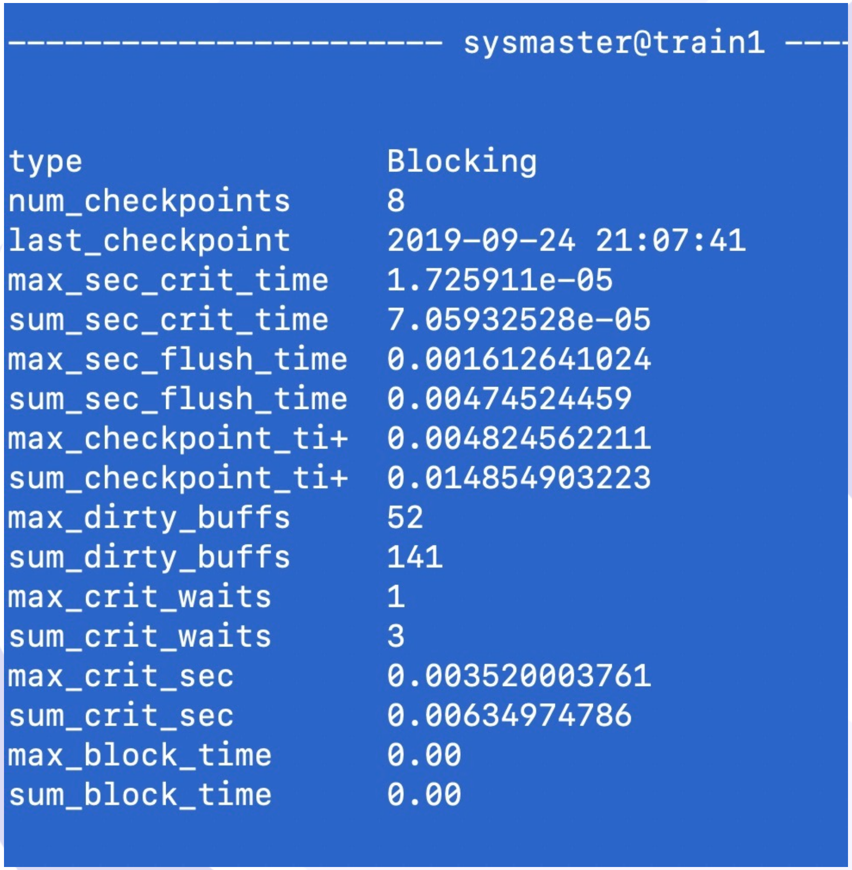
- What is a summary of my Checkpoint Performance?
  - – Checkpoint_summary.sql
- What are the details of the last 10 Checkpoints?
  - – Checkpoint_last.sql

Checkpoint Performance Summary

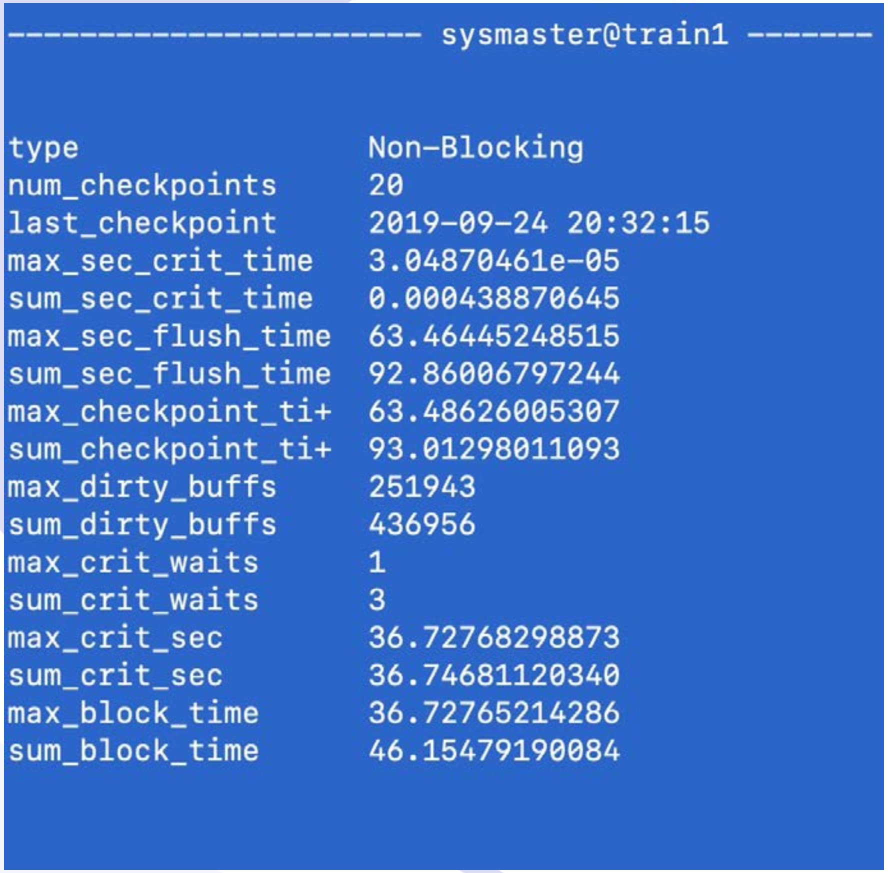


```
-----------------------------------------------------------------------------
-- Module: @(#)checkpoint_sumary.sql    1.0     Date: 2019/09/01
-- Author: Lester Knutsen  Email: lester@advancedatatools.com
--         Advanced DataTools Corporation
-- Description:
--      Tested with Informix 12.10 and Informix 14.10
-- Update: 1/20/2023 - Tested on Informix 14.10.FC9
-----------------------------------------------------------------------------

database sysmaster;

-- unload to checkpoint_sumary.uld
select
        type,
        count(*) num_checkpoints,
        max ( dbinfo( "utc_to_datetime", clock_time)) last_checkpoint,   -- Clock time of the checkpoint
        max ( crit_time ) max_sec_crit_time, -- Fractional seconds spent in critical sections
        sum ( crit_time ) sum_sec_crit_time, -- Fractional seconds spent in critical sections
        max ( flush_time ) max_sec_flush_time, -- Fractional seconds spent flushing dirty pages during the checkpoint
        sum ( flush_time ) sum_sec_flush_time, -- Fractional seconds spent flushing dirty pages during the checkpoint
        max ( cp_time ) max_checkpoint_time, -- Duration of the checkpoint in fractional seconds
        sum ( cp_time ) sum_checkpoint_time, -- Duration of the checkpoint in fractional seconds
        max ( n_dirty_buffs ) max_dirty_buffs, -- Number of dirty buffers at the beginning of the checkpoint
        sum ( n_dirty_buffs ) sum_dirty_buffs, -- Number of dirty buffers at the beginning of the checkpoint
        max ( n_crit_waits ) max_crit_waits, -- Number of processes that had to wait for the checkpoint
        sum ( n_crit_waits ) sum_crit_waits, -- Number of processes that had to wait for the checkpoint
        max ( tot_crit_wait ) max_crit_sec, -- Total time all processes waited for the checkpoint - fractional seconds
        sum ( tot_crit_wait ) sum_crit_sec, -- Total time all processes waited for the checkpoint - fractional seconds
        max ( block_time ) max_block_time, -- Longest any process had to wait for the checkpoint - fractional seconds
        sum ( block_time ) sum_block_time -- Longest any process had to wait for the checkpoint - fractional seconds
from syscheckpoint
group by 1
order by 1 ;
```

Checkpoint_summary.sql



```
------------------------ sysmaster@train1 ----


type                   Blocking
num_checkpoints        8
last_checkpoint        2019-09-24 21:07:41
max_sec_crit_time      1.725911e-05
sum_sec_crit_time      7.05932528e-05
max_sec_flush_time     0.001612641024
sum_sec_flush_time     0.00474524459
max_checkpoint_ti+     0.004824562211
sum_checkpoint_ti+     0.014854903223
max_dirty_buffs        52
sum_dirty_buffs        141
max_crit_waits         1
sum_crit_waits         3
max_crit_sec           0.003520003761
sum_crit_sec           0.00634974786
max_block_time         0.00
sum_block_time         0.00
```

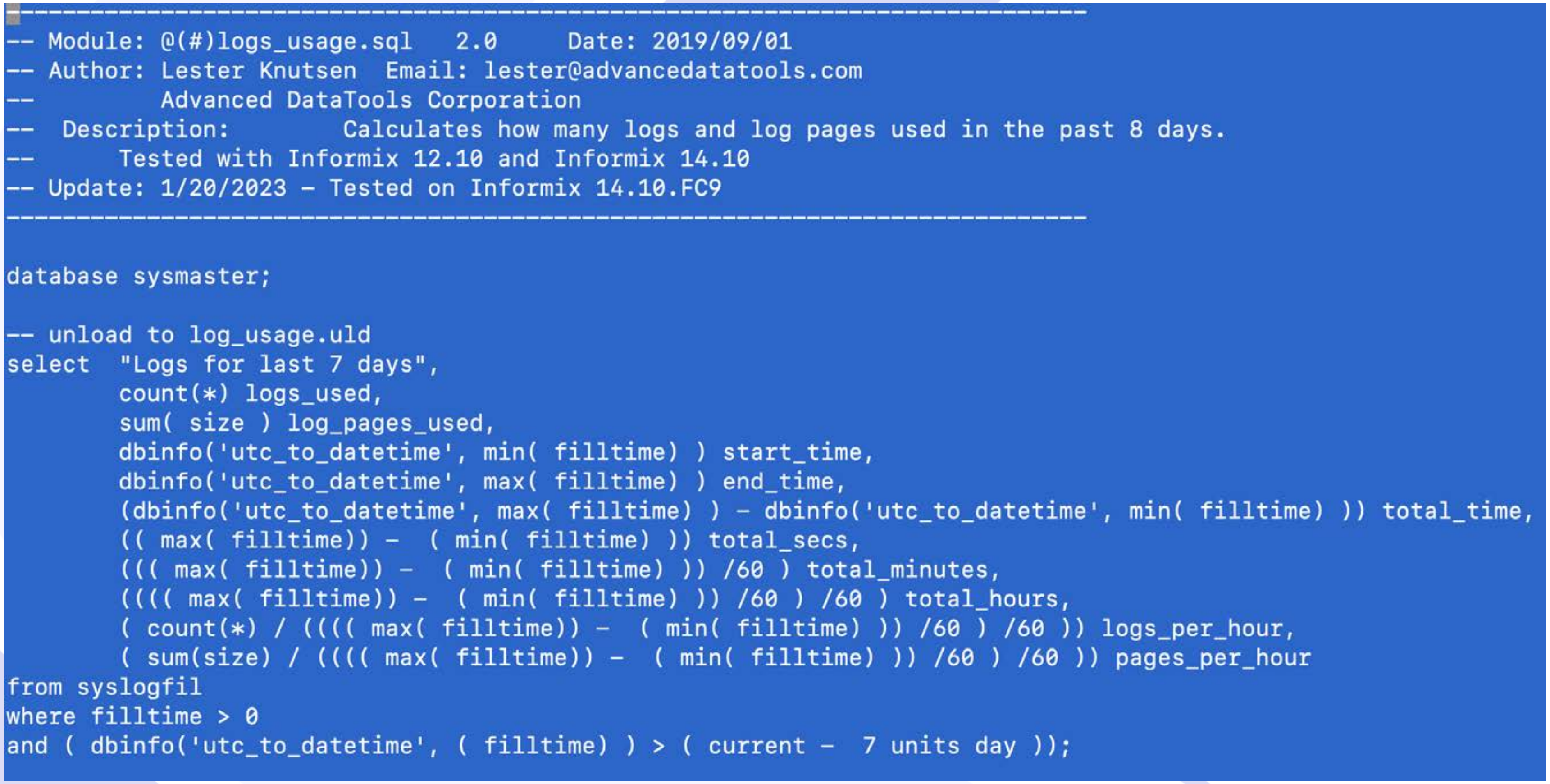


```
---------------------- sysmaster@train1 -------


type                   Non-Blocking
num_checkpoints        20
last_checkpoint        2019-09-24 20:32:15
max_sec_crit_time      3.04870461e-05
sum_sec_crit_time      0.000438870645
max_sec_flush_time     63.46445248515
sum_sec_flush_time     92.86006797244
max_checkpoint_ti+     63.48626005307
sum_checkpoint_ti+     93.01298011093
max_dirty_buffs        251943
sum_dirty_buffs        436956
max_crit_waits         1
sum_crit_waits         3
max_crit_sec           36.72768298873
sum_crit_sec           36.74681120340
max_block_time         36.72765214286
sum_block_time         46.15479190084
```

Logical Log Performance

- For HDR Planning – How much data will be going to the Secondary Servers?
- What is my Log turnover rate?
- Do I have enough Logs?
- Are the Logs too small or too big?
- Goal – Enough Logs for 4 days
- Goal – Turnover 12 to 24 Logs per hour

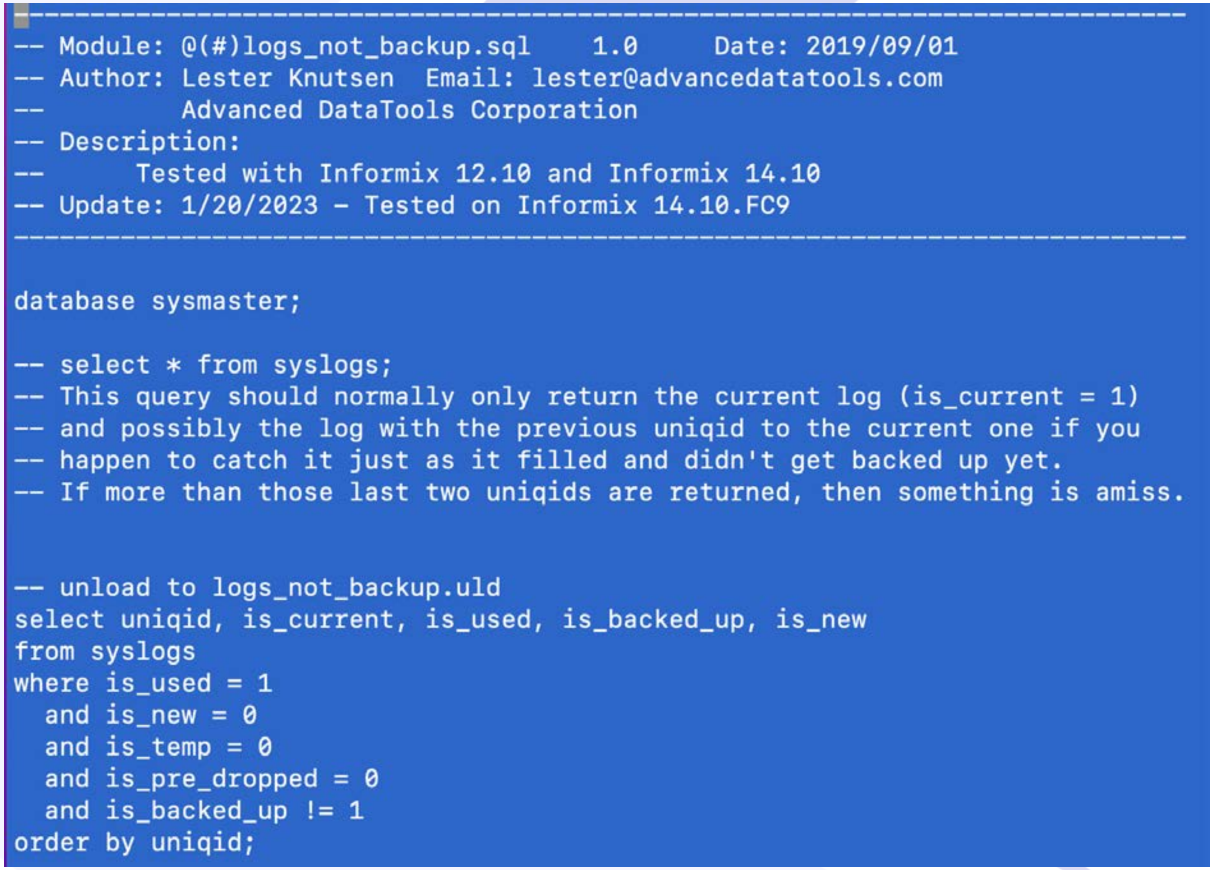
Logical Log Performance



```
-----------------------------------------------------------------------------
-- Module: @(#)logs_usage.sql   2.0     Date: 2019/09/01
-- Author: Lester Knutsen  Email: lester@advancedatatools.com
--        Advanced DataTools Corporation
--  Description:        Calculates how many logs and log pages used in the past 8 days.
--      Tested with Informix 12.10 and Informix 14.10
-- Update: 1/20/2023 - Tested on Informix 14.10.FC9
-----------------------------------------------------------------------------

database sysmaster;

-- unload to log_usage.uld
select  "Logs for last 7 days",
        count(*) logs_used,
        sum( size ) log_pages_used,
        dbinfo('utc_to_datetime', min( filltime) ) start_time,
        dbinfo('utc_to_datetime', max( filltime) ) end_time,
        (dbinfo('utc_to_datetime', max( filltime) ) - dbinfo('utc_to_datetime', min( filltime) )) total_time,
        (( max( filltime)) -  ( min( filltime) )) total_secs,
        ((( max( filltime)) -  ( min( filltime) )) /60 ) total_minutes,
        (((( max( filltime)) -  ( min( filltime) )) /60 ) /60 ) total_hours,
        ( count(*) / (((( max( filltime)) -  ( min( filltime) )) /60 ) /60 )) logs_per_hour,
        ( sum(size) / (((( max( filltime)) -  ( min( filltime) )) /60 ) /60 )) pages_per_hour
from syslogfil
where filltime > 0
and ( dbinfo('utc_to_datetime', ( filltime) ) > ( current -  7 units day ));
```

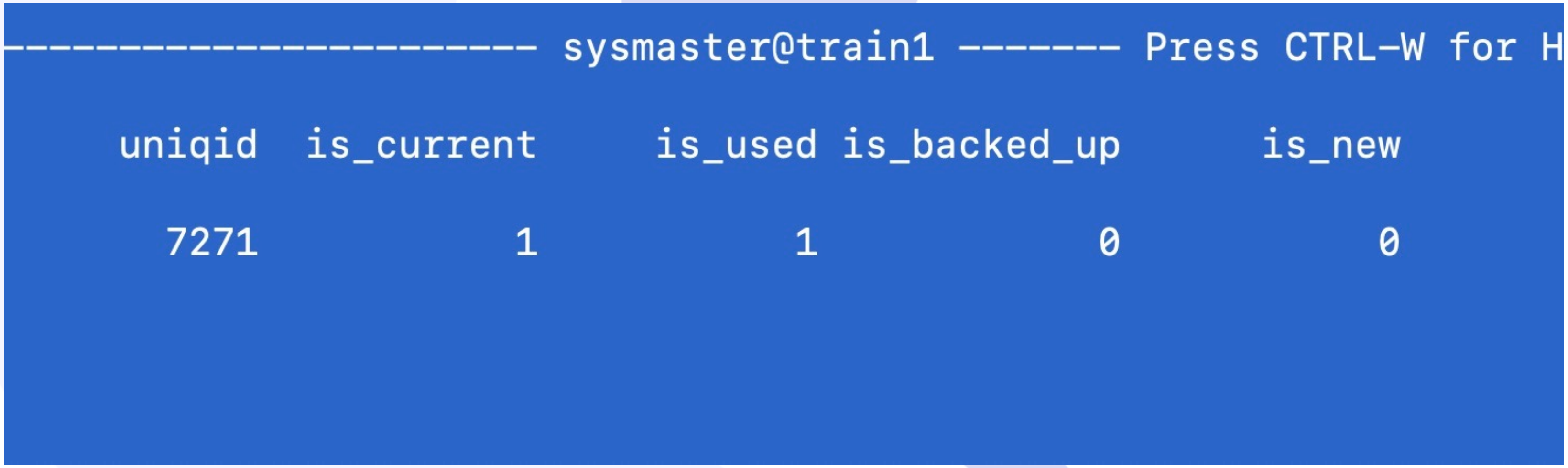
Advanced DataTools

Logical Log Not Backed up



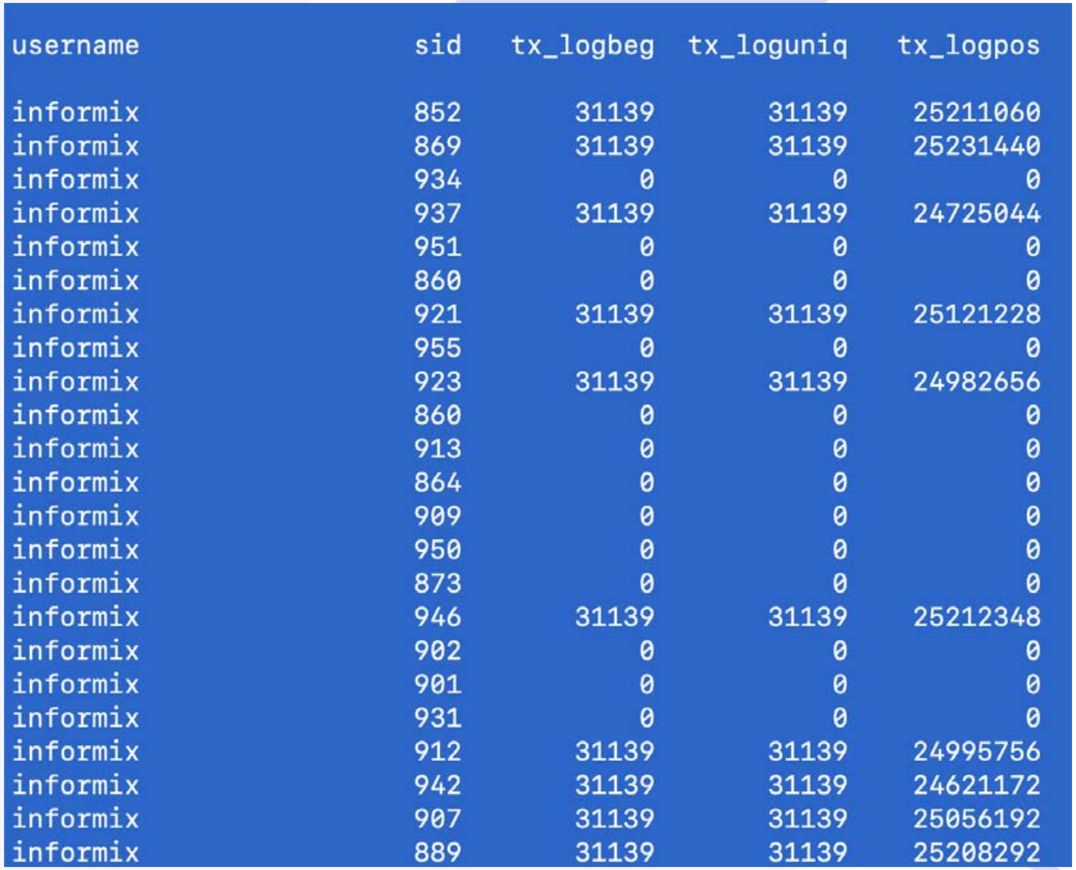
```
-----------------------------------------------------------------------------
-- Module: @(#)logs_not_backup.sql    1.0     Date: 2019/09/01
-- Author: Lester Knutsen  Email: lester@advancedatatools.com
--         Advanced DataTools Corporation
-- Description:
--      Tested with Informix 12.10 and Informix 14.10
-- Update: 1/20/2023 - Tested on Informix 14.10.FC9
-----------------------------------------------------------------------------

database sysmaster;

-- select * from syslogs;
-- This query should normally only return the current log (is_current = 1)
-- and possibly the log with the previous uniqid to the current one if you
-- happen to catch it just as it filled and didn't get backed up yet.
-- If more than those last two uniqids are returned, then something is amiss.


-- unload to logs_not_backup.uld
select uniqid, is_current, is_used, is_backed_up, is_new
from syslogs
where is_used = 1
  and is_new = 0
  and is_temp = 0
  and is_pre_dropped = 0
  and is_backed_up != 1
order by uniqid;
```

Logs_not_backup.sql



```
----------------------- sysmaster@train1 ------- Press CTRL-W for H

     uniqid  is_current      is_used is_backed_up      is_new

       7271           1            1            0           0
```

Show Users and which Logs they are using-logs_position.sql



```
username                  sid   tx_logbeg  tx_loguniq    tx_logpos

informix                  852       31139       31139     25211060
informix                  869       31139       31139     25231440
informix                  934           0           0            0
informix                  937       31139       31139     24725044
informix                  951           0           0            0
informix                  860           0           0            0
informix                  921       31139       31139     25121228
informix                  955           0           0            0
informix                  923       31139       31139     24982656
informix                  860           0           0            0
informix                  913           0           0            0
informix                  864           0           0            0
informix                  909           0           0            0
informix                  950           0           0            0
informix                  873           0           0            0
informix                  946       31139       31139     25212348
informix                  902           0           0            0
informix                  901           0           0            0
informix                  931           0           0            0
informix                  912       31139       31139     24995756
informix                  942       31139       31139     24621172
informix                  907       31139       31139     25056192
informix                  889       31139       31139     25208292
```

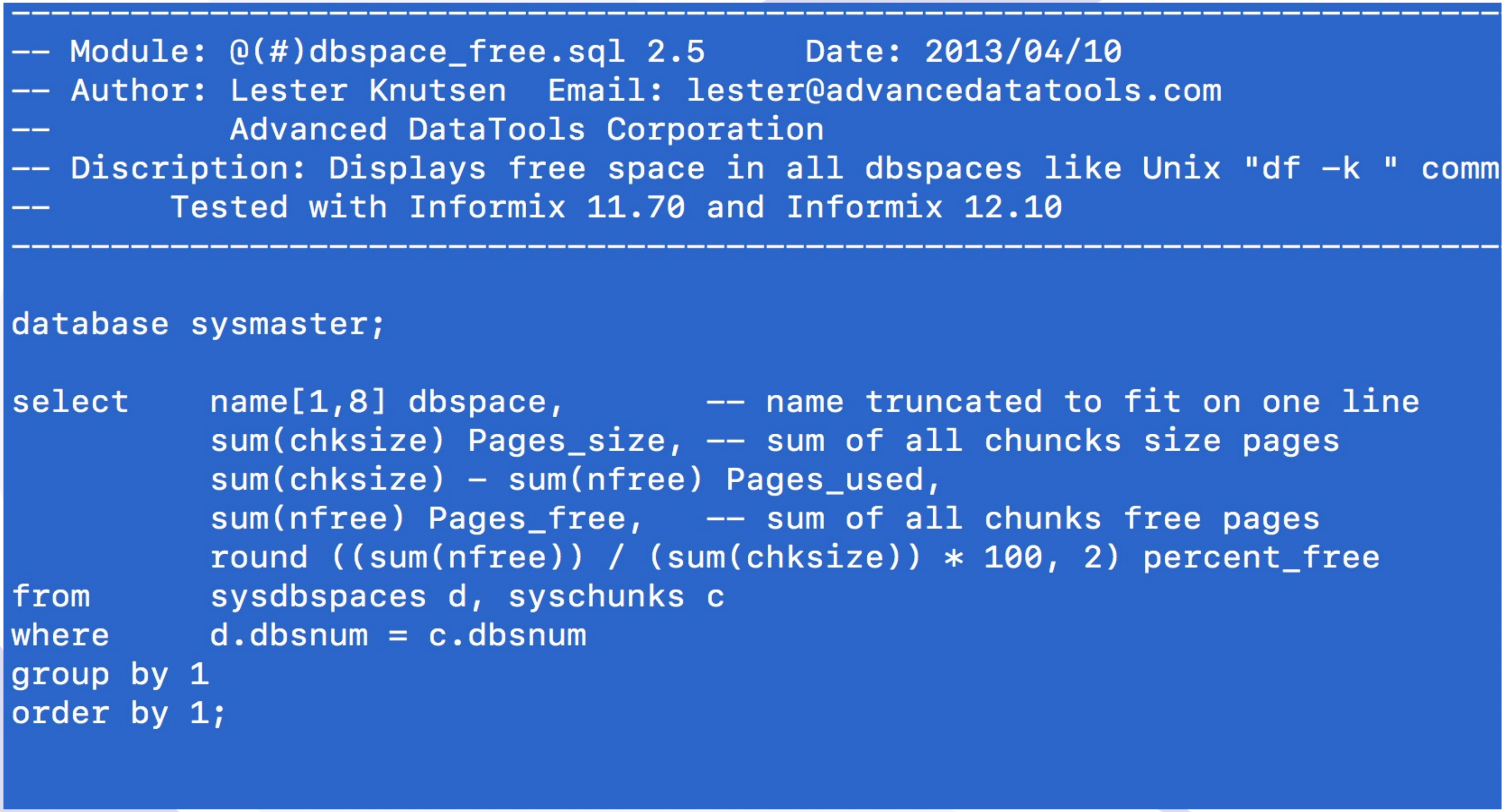
Dbspace and Chunks Performance Scripts

- dbspace_free.sql
- chunk_io.sql
- dbspace_io.sql

DBspace and Chunks Performance

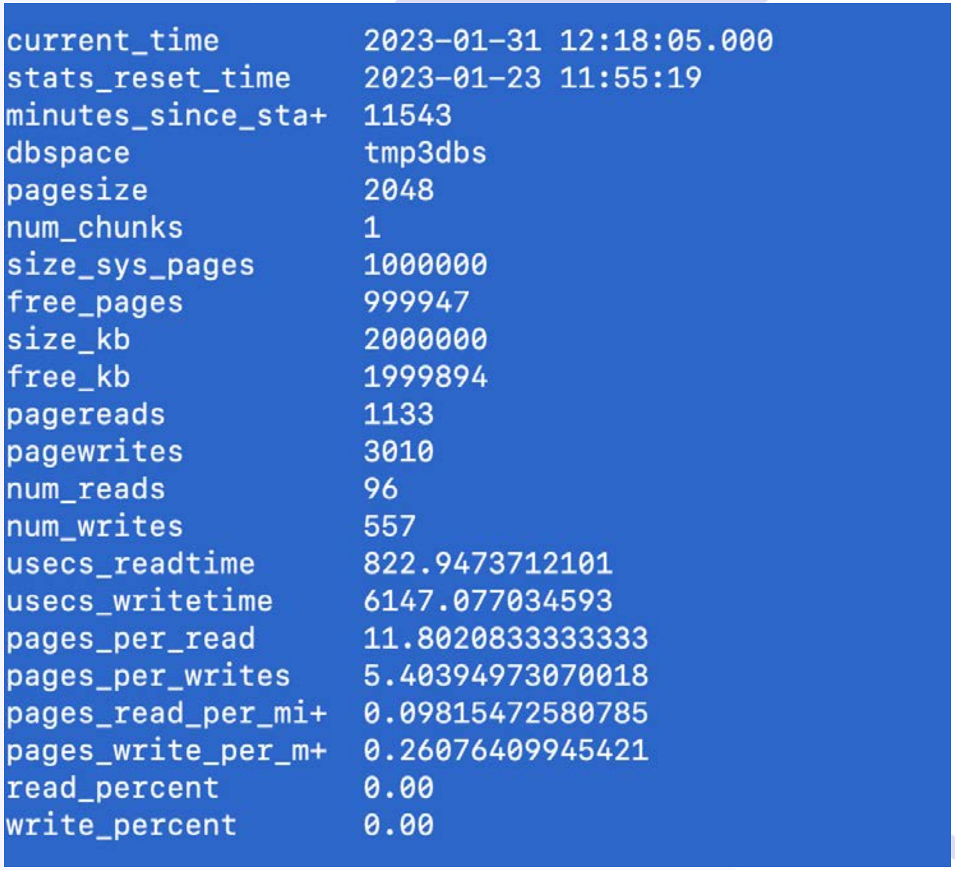
- Started with a script to measure dbspace free
- Added Summary of underlying Chunk IO
- Added Ratios
  - Real read ahead
  - Pages per read/write operation
  - Pages read per minute
  - Pages write per minute
  - Percent of Total IO
- Data from syschktab and sysdbstab

What Percent of Dbspace is Free?



```
---------------------------------------------------------------------------
-- Module: @(#)dbspace_free.sql 2.5     Date: 2013/04/10
-- Author: Lester Knutsen  Email: lester@advancedatatools.com
--         Advanced DataTools Corporation
-- Discription: Displays free space in all dbspaces like Unix "df -k " comm
--      Tested with Informix 11.70 and Informix 12.10
---------------------------------------------------------------------------


database sysmaster;

select    name[1,8] dbspace,       -- name truncated to fit on one line
          sum(chksize) Pages_size, -- sum of all chuncks size pages
          sum(chksize) - sum(nfree) Pages_used,
          sum(nfree) Pages_free,   -- sum of all chunks free pages
          round ((sum(nfree)) / (sum(chksize)) * 100, 2) percent_free
from      sysdbspaces d, syschunks c
where     d.dbsnum = c.dbsnum
group by 1
order by 1;
```

Dbspaceio.sql



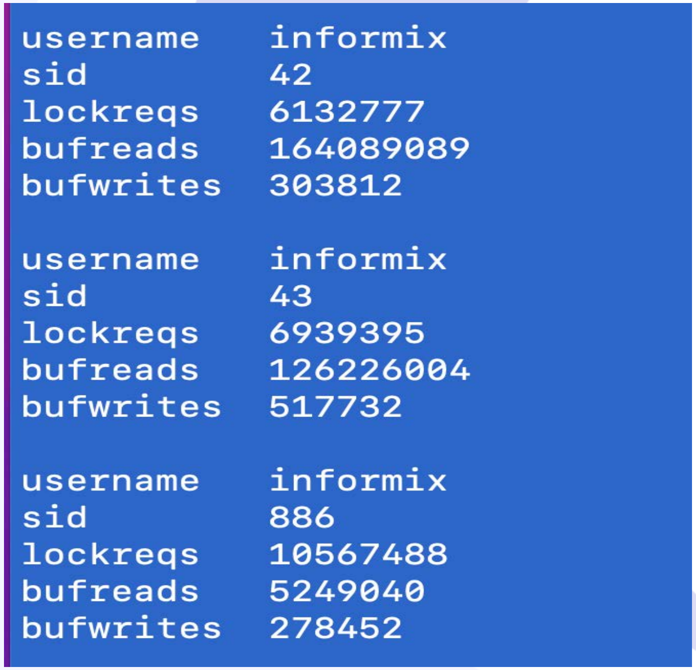
```
current_time         2023-01-31 12:18:05.000
stats_reset_time     2023-01-23 11:55:19
minutes_since_sta+   11543
dbspace              tmp3dbs
pagesize             2048
num_chunks           1
size_sys_pages       1000000
free_pages           999947
size_kb              2000000
free_kb              1999894
pagereads            1133
pagewrites           3010
num_reads            96
num_writes           557
usecs_readtime       822.9473712101
usecs_writetime      6147.077034593
pages_per_read       11.8020833333333
pages_per_writes     5.40394973070018
pages_read_per_mi+   0.09815472580785
pages_write_per_m+   0.26076409945421
read_percent         0.00
write_percent        0.00
```

Session Performance and Monitoring Scripts

- session_lockwait.sql
- session_statistics.sql
- session_wait_list.sql

Displays User Session Profile info

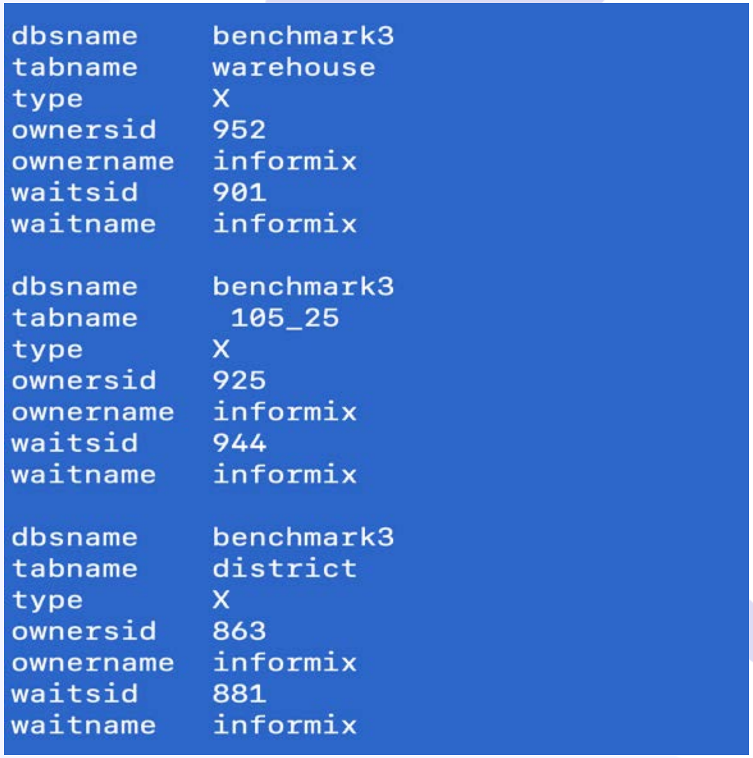
- session_statistics.sql



```
username    informix
sid         42
lockreqs    6132777
bufreads    164089089
bufwrites   303812

username    informix
sid         43
lockreqs    6939395
bufreads    126226004
bufwrites   517732

username    informix
sid         886
lockreqs    10567488
bufreads    5249040
bufwrites   278452
```

Displays only Locks with Other Users Waiting

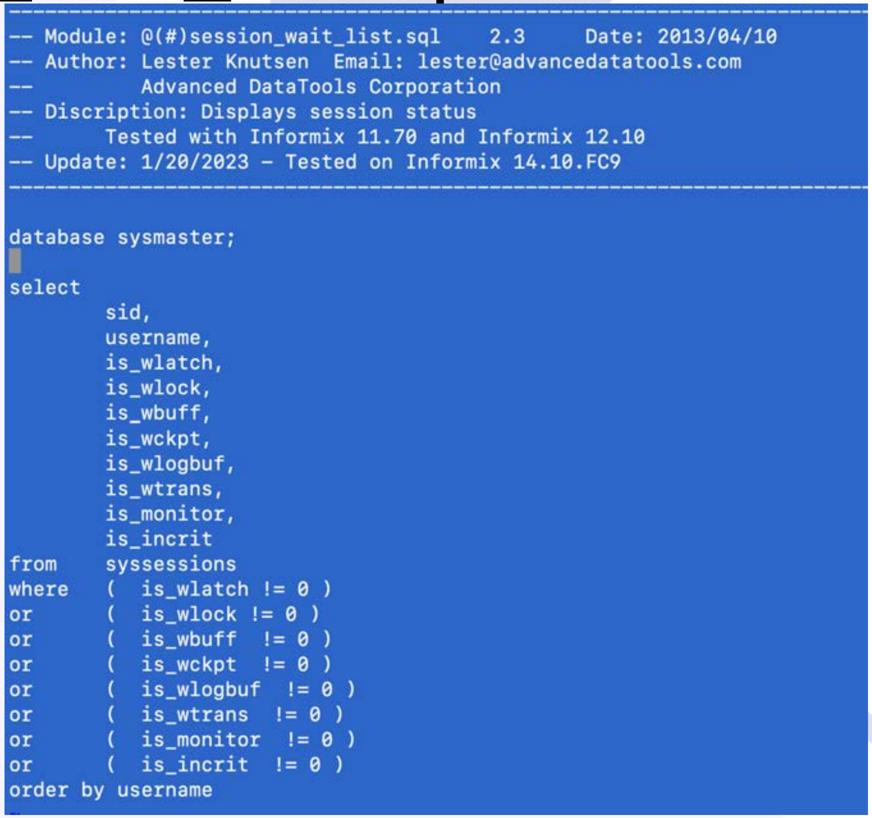
- session_lockwait.sql



```
dbsname     benchmark3
tabname     warehouse
type        X
ownersid    952
ownername   informix
waitsid     901
waitname    informix

dbsname     benchmark3
tabname      105_25
type        X
ownersid    925
ownername   informix
waitsid     944
waitname    informix

dbsname     benchmark3
tabname     district
type        X
ownersid    863
ownername   informix
waitsid     881
waitname    informix
```

Displays User Session Waits and Status

- session_wait_list.sql

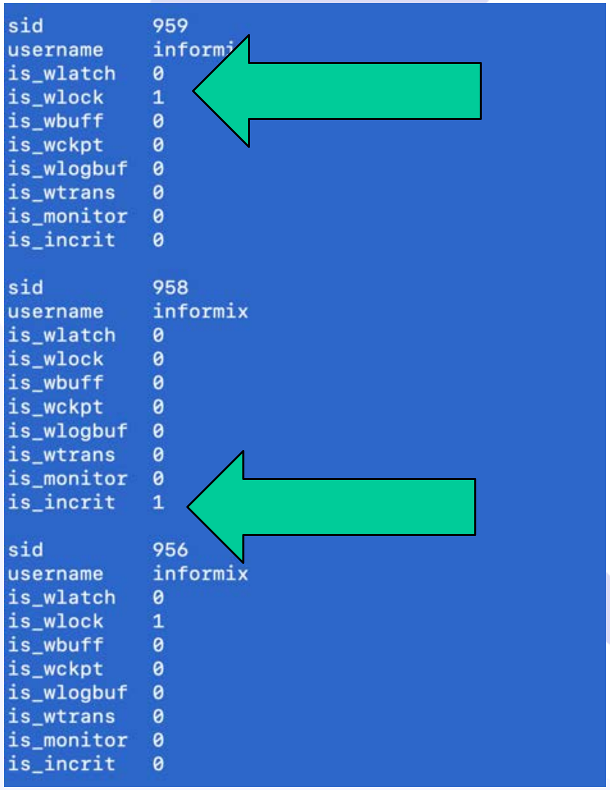


```
------------------------------------------------------------------------
-- Module: @(#)session_wait_list.sql    2.3     Date: 2013/04/10
-- Author: Lester Knutsen  Email: lester@advancedatatools.com
--         Advanced DataTools Corporation
-- Discription: Displays session status
--      Tested with Informix 11.70 and Informix 12.10
-- Update: 1/20/2023 - Tested on Informix 14.10.FC9
------------------------------------------------------------------------

database sysmaster;

select
        sid,
        username,
        is_wlatch,
        is_wlock,
        is_wbuff,
        is_wckpt,
        is_wlogbuf,
        is_wtrans,
        is_monitor,
        is_incrit
from    syssessions
where   (  is_wlatch != 0 )
or      (  is_wlock != 0 )
or      (  is_wbuff  != 0 )
or      (  is_wckpt  != 0 )
or      (  is_wlogbuf  != 0 )
or      (  is_wtrans  != 0 )
or      (  is_monitor  != 0 )
or      (  is_incrit  != 0 )
order by username
```

Advanced DataTools

Displays User Session Waits and Status

- session_wait_list.sql



```
sid           959
username      informi
is_wlatch     0
is_wlock      1
is_wbuff      0
is_wckpt      0
is_wlogbuf    0
is_wtrans     0
is_monitor    0
is_incrit     0

sid           958
username      informix
is_wlatch     0
is_wlock      0
is_wbuff      0
is_wckpt      0
is_wlogbuf    0
is_wtrans     0
is_monitor    0
is_incrit     1

sid           956
username      informix
is_wlatch     0
is_wlock      1
is_wbuff      0
is_wckpt      0
is_wlogbuf    0
is_wtrans     0
is_monitor    0
is_incrit     0
```

Table Performance Scripts

- table_extent_plan.sql
- table_info_all.sql
- table_info_freerows.sql
- table_io_statistics.sql
- table_performance.sql
- table_waste_space.sql
- table_with_seqscans.sql

Table Performance and Information

- table_info_all.sql
- Everything you want to know about your tables
- Load results into an Excel Worksheet
- Updated to exclude System tables and Indexes

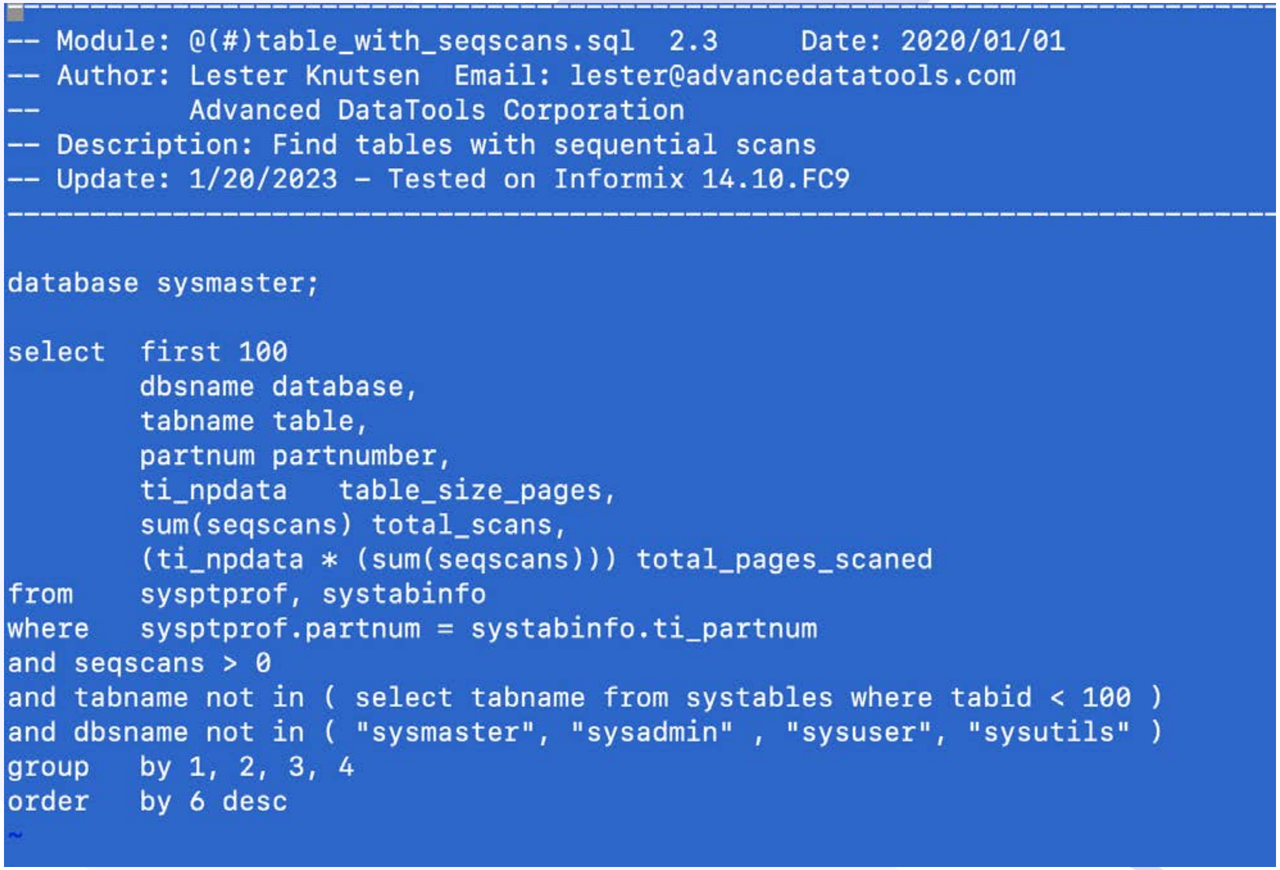
Questions about Tables

- What tables fit on a page?
- What tables have free space before a new extent?
- How big are the tables?
- What tables have the most lock activity?
- What tables have the most I/O activity?
- What tables have sequential scans?
- What is the buffer read % by table?
- What tables could be partitioned?

Base Tables

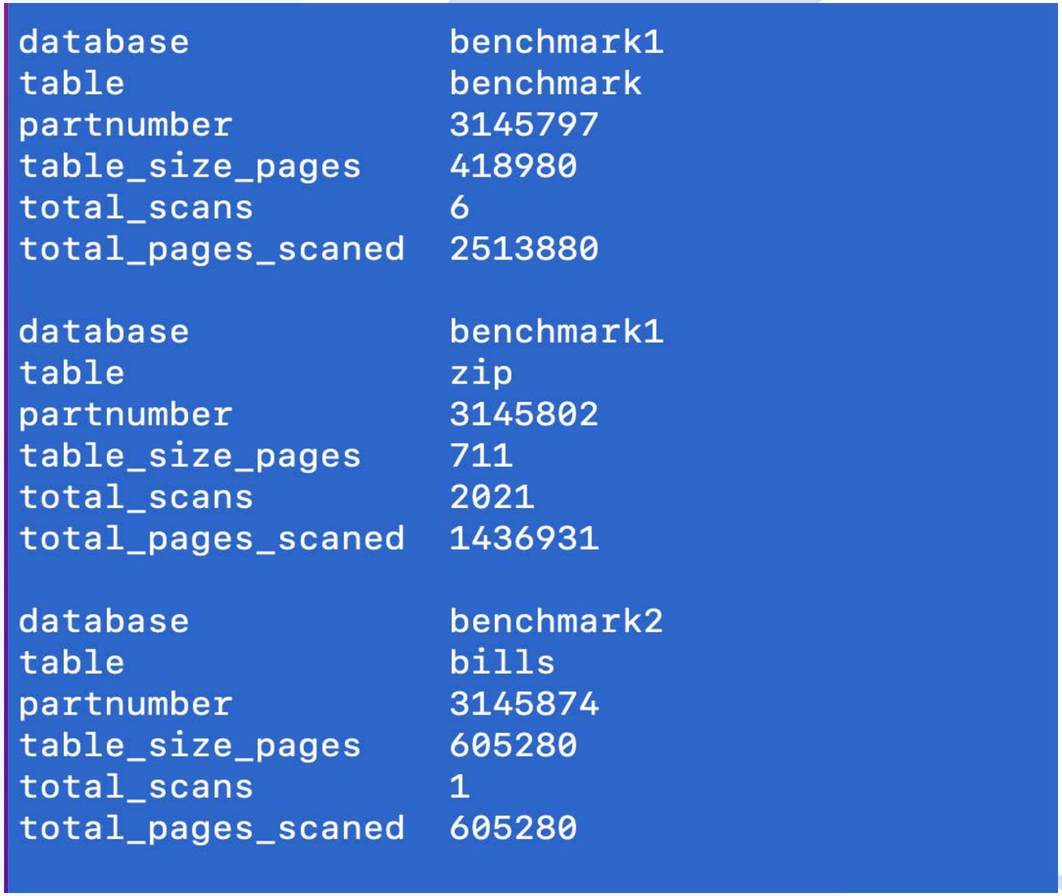
- Systabnames – Basic Table Information
- Systabinfo – undocumented
- Sysptprof – Performance Information

Show Tables with Most Sequential Scans



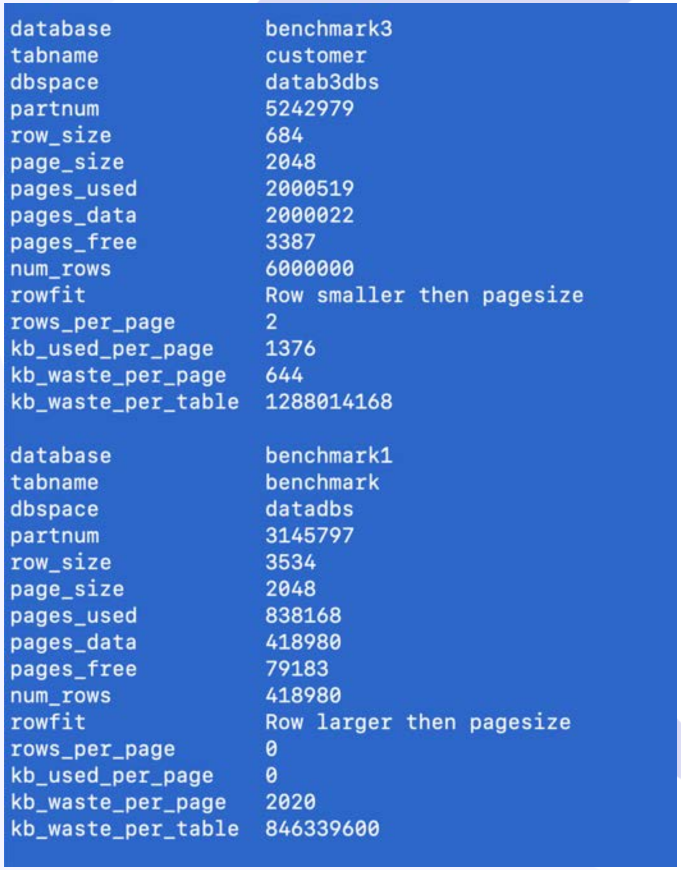
```
-----------------------------------------------------------------------------
-- Module: @(#)table_with_seqscans.sql  2.3     Date: 2020/01/01
-- Author: Lester Knutsen  Email: lester@advancedatatools.com
--         Advanced DataTools Corporation
-- Description: Find tables with sequential scans
-- Update: 1/20/2023 - Tested on Informix 14.10.FC9
-----------------------------------------------------------------------------

database sysmaster;

select  first 100
        dbsname database,
        tabname table,
        partnum partnumber,
        ti_npdata   table_size_pages,
        sum(seqscans) total_scans,
        (ti_npdata * (sum(seqscans))) total_pages_scaned
from    sysptprof, systabinfo
where   sysptprof.partnum = systabinfo.ti_partnum
and seqscans > 0
and tabname not in ( select tabname from systables where tabid < 100 )
and dbsname not in ( "sysmaster", "sysadmin" , "sysuser", "sysutils" )
group   by 1, 2, 3, 4
order   by 6 desc
~
```

Show Tables with Most Sequential Scans



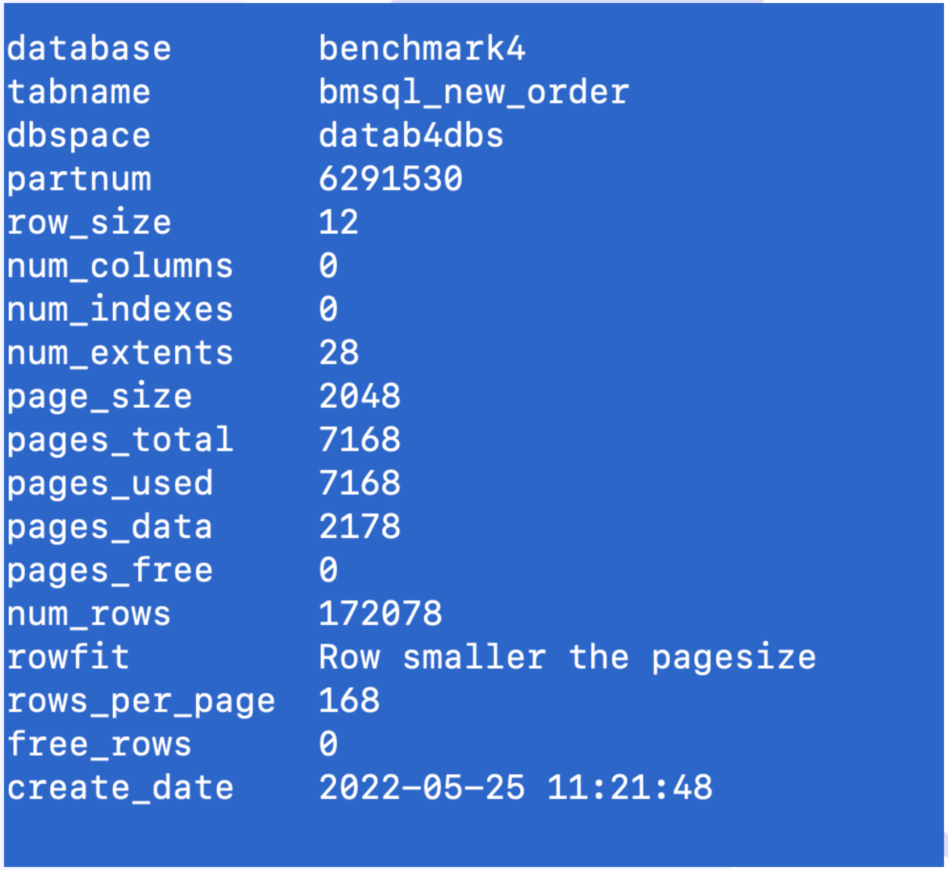
```
database            benchmark1
table               benchmark
partnumber          3145797
table_size_pages    418980
total_scans         6
total_pages_scaned  2513880

database            benchmark1
table               zip
partnumber          3145802
table_size_pages    711
total_scans         2021
total_pages_scaned  1436931

database            benchmark2
table               bills
partnumber          3145874
table_size_pages    605280
total_scans         1
total_pages_scaned  605280
```

Show Tables with Wasted Space - table_waste_space.sql



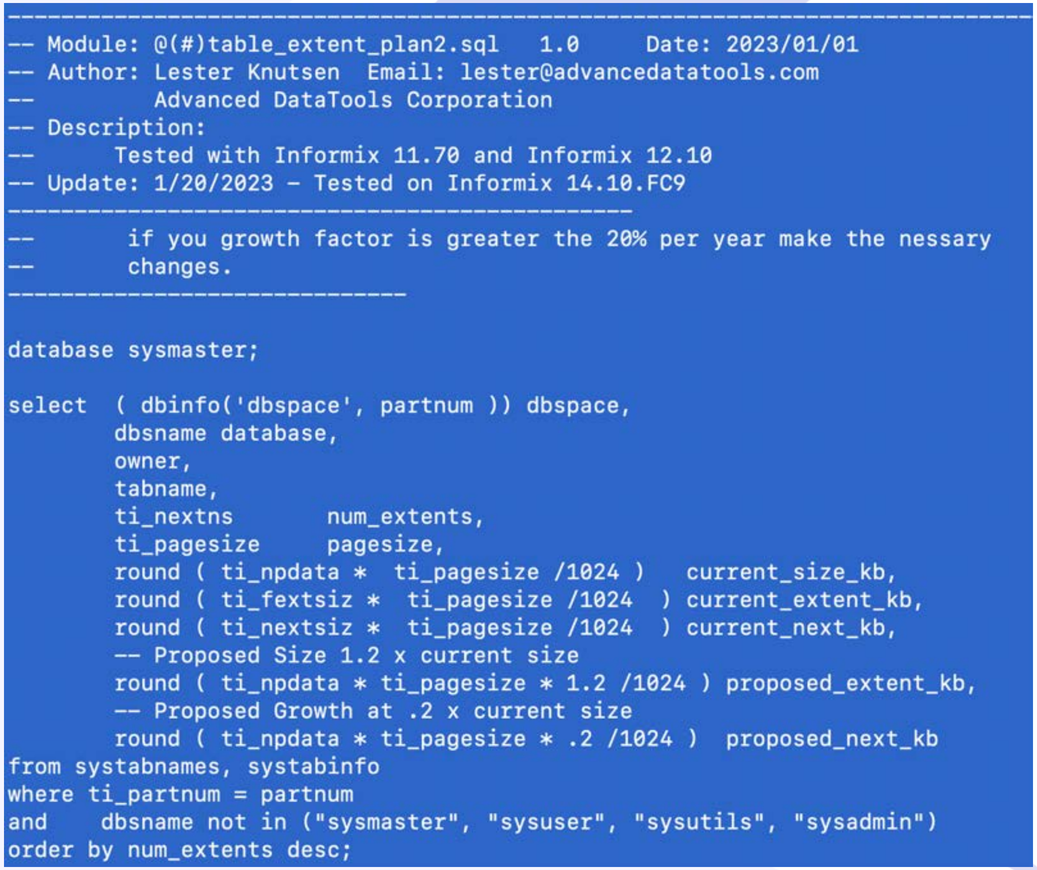
```
database           benchmark3
tabname            customer
dbspace            datab3dbs
partnum            5242979
row_size           684
page_size          2048
pages_used         2000519
pages_data         2000022
pages_free         3387
num_rows           6000000
rowfit             Row smaller then pagesize
rows_per_page      2
kb_used_per_page   1376
kb_waste_per_page  644
kb_waste_per_table 1288014168

database           benchmark1
tabname            benchmark
dbspace            datadbs
partnum            3145797
row_size           3534
page_size          2048
pages_used         838168
pages_data         418980
pages_free         79183
num_rows           418980
rowfit             Row larger then pagesize
rows_per_page      0
kb_used_per_page   0
kb_waste_per_page  2020
kb_waste_per_table 846339600
```

Show Tables with Free Row Space: table_info_freerows.sql



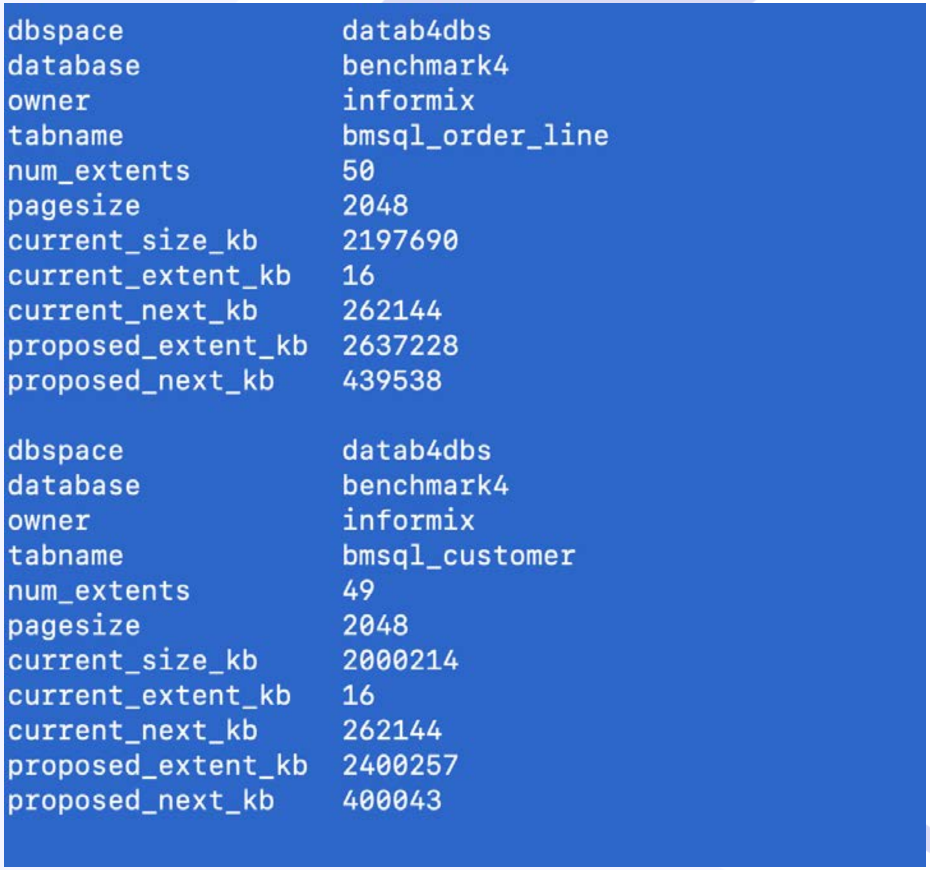
```
database          benchmark4
tabname           bmsql_new_order
dbspace           datab4dbs
partnum           6291530
row_size          12
num_columns       0
num_indexes       0
num_extents       28
page_size         2048
pages_total       7168
pages_used        7168
pages_data        2178
pages_free        0
num_rows          172078
rowfit            Row smaller the pagesize
rows_per_page     168
free_rows         0
create_date       2022-05-25 11:21:48
```

Show Proposed Extent Sizing Plan: table_extent_plan.sql



```
-----------------------------------------------------------------------------
-- Module: @(#)table_extent_plan2.sql   1.0     Date: 2023/01/01
-- Author: Lester Knutsen  Email: lester@advancedatatools.com
--         Advanced DataTools Corporation
-- Description:
--      Tested with Informix 11.70 and Informix 12.10
-- Update: 1/20/2023 - Tested on Informix 14.10.FC9
-----------------------------------------------
--       if you growth factor is greater the 20% per year make the nessary
--       changes.
------------------------------

database sysmaster;

select  ( dbinfo('dbspace', partnum )) dbspace,
        dbsname database,
        owner,
        tabname,
        ti_nextns       num_extents,
        ti_pagesize     pagesize,
        round ( ti_npdata *  ti_pagesize /1024 )   current_size_kb,
        round ( ti_fextsiz *  ti_pagesize /1024  ) current_extent_kb,
        round ( ti_nextsiz *  ti_pagesize /1024  ) current_next_kb,
        -- Proposed Size 1.2 x current size
        round ( ti_npdata * ti_pagesize * 1.2 /1024 ) proposed_extent_kb,
        -- Proposed Growth at .2 x current size
        round ( ti_npdata * ti_pagesize * .2 /1024 )  proposed_next_kb
from systabnames, systabinfo
where ti_partnum = partnum
and    dbsname not in ("sysmaster", "sysuser", "sysutils", "sysadmin")
order by num_extents desc;
```

Show proposed extent sizing plan: table_extent_plan.sql



```
dbspace              datab4dbs
database             benchmark4
owner                informix
tabname              bmsql_order_line
num_extents          50
pagesize             2048
current_size_kb      2197690
current_extent_kb    16
current_next_kb      262144
proposed_extent_kb   2637228
proposed_next_kb     439538

dbspace              datab4dbs
database             benchmark4
owner                informix
tabname              bmsql_customer
num_extents          49
pagesize             2048
current_size_kb      2000214
current_extent_kb    16
current_next_kb      262144
proposed_extent_kb   2400257
proposed_next_kb     400043
```

Monitoring Index Performance and Usage

- DB_index_usage.sql
- DB_loop_run.sh

Index Performance and Usage

- When was my index last used?
  - – Oncheck –pt database:table
- What is the ratio of index reads to writes?
- The more reads, the more efficiently an index is used..

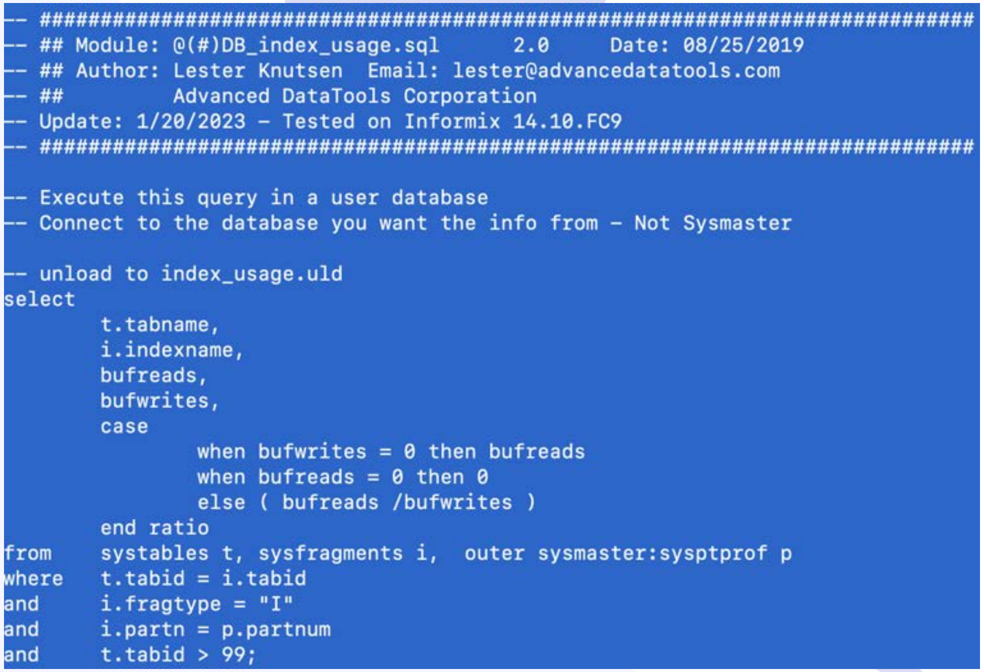
We will Use Data from 3 Sources

- Sysmaster database
- Sysadmin database
- System Tables in each database

- Important to join between Sysmaster and Systables database using table partno to avoid duplicate data

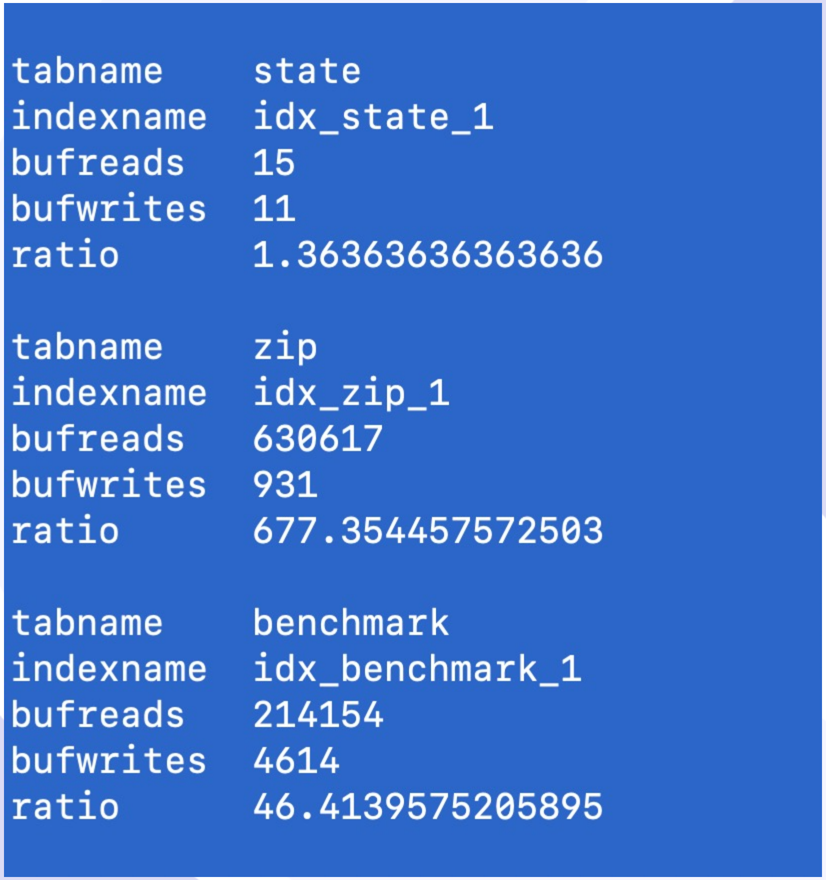
How to Monitor Index Usage

Compare reads and writes on an index by partition …fewer reads indicates the index may not be needed unless it is a constraint

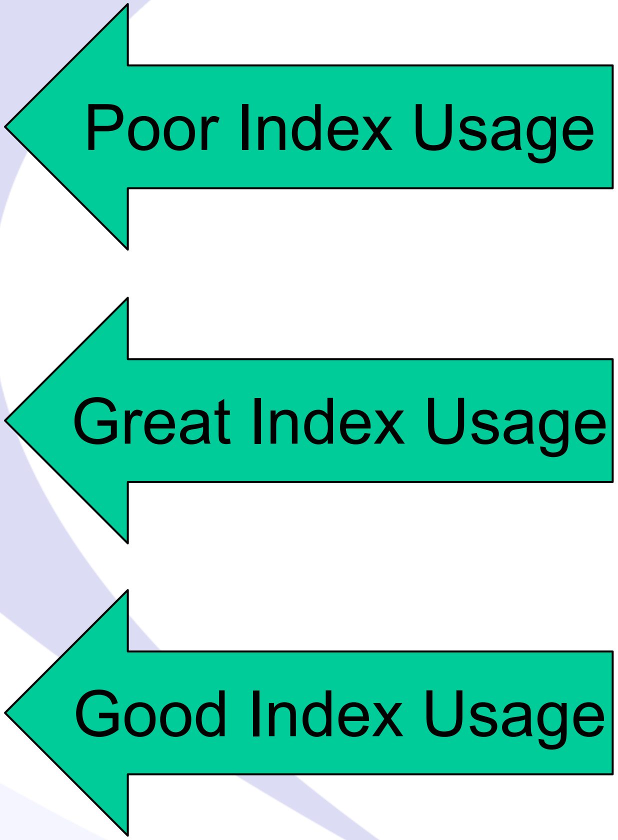


```
-- #############################################################################
-- ## Module: @(#)DB_index_usage.sql      2.0     Date: 08/25/2019
-- ## Author: Lester Knutsen  Email: lester@advancedatatools.com
-- ##         Advanced DataTools Corporation
-- Update: 1/20/2023 - Tested on Informix 14.10.FC9
-- #############################################################################

-- Execute this query in a user database
-- Connect to the database you want the info from - Not Sysmaster

-- unload to index_usage.uld
select
        t.tabname,
        i.indexname,
        bufreads,
        bufwrites,
        case
                when bufwrites = 0 then bufreads
                when bufreads = 0 then 0
                else ( bufreads /bufwrites )
        end ratio
from    systables t, sysfragments i,  outer sysmaster:sysptprof p
where   t.tabid = i.tabid
and     i.fragtype = "I"
and     i.partn = p.partnum
and     t.tabid > 99;
```

New - How to Monitor Index Usage



```
tabname     state
indexname   idx_state_1
bufreads    15
bufwrites   11
ratio       1.36363636363636

tabname     zip
indexname   idx_zip_1
bufreads    630617
bufwrites   931
ratio       677.354457572503

tabname     benchmark
indexname   idx_benchmark_1
bufreads    214154
bufwrites   4614
ratio       46.4139575205895
```

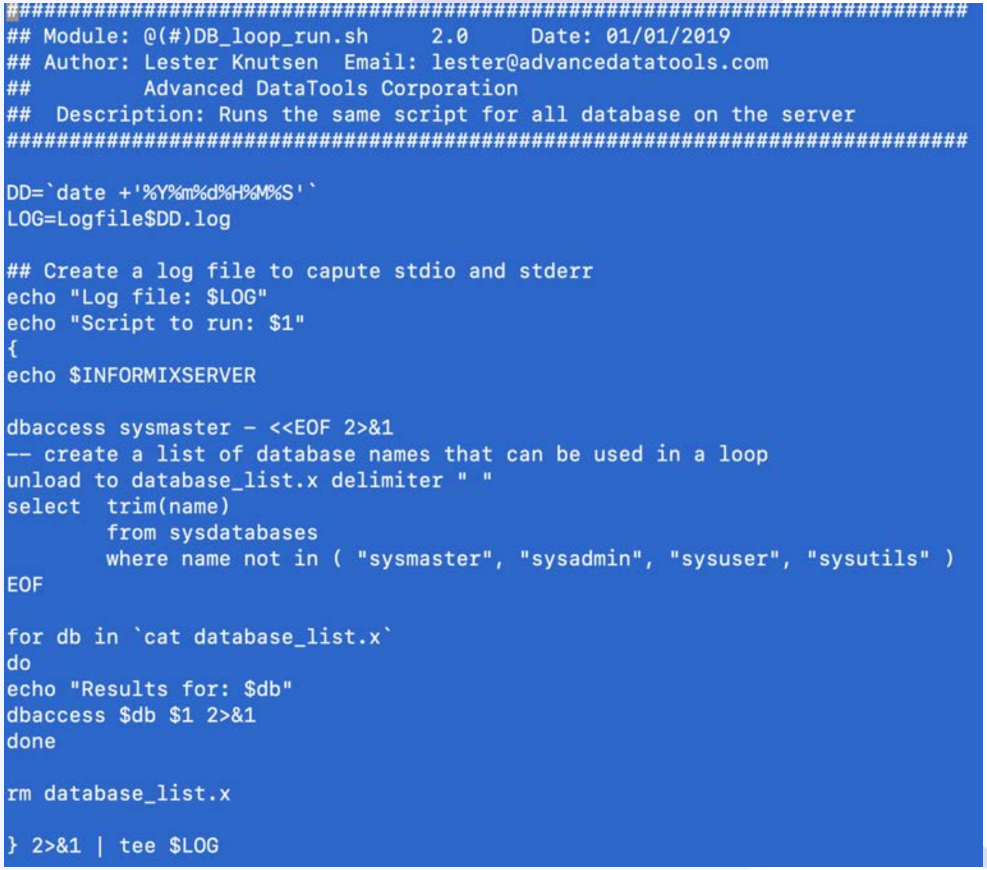


Poor Index Usage

Great Index Usage

Good Index Usage

DB_loop_run.sh - Script to create a list of databases and loop through a script for each database



```
##############################################################################
## Module: @(#)DB_loop_run.sh     2.0     Date: 01/01/2019
## Author: Lester Knutsen  Email: lester@advancedatatools.com
##         Advanced DataTools Corporation
##  Description: Runs the same script for all database on the server
##############################################################################

DD=`date +'%Y%m%d%H%M%S'`
LOG=Logfile$DD.log

## Create a log file to capute stdio and stderr
echo "Log file: $LOG"
echo "Script to run: $1"
{
echo $INFORMIXSERVER

dbaccess sysmaster - <<EOF 2>&1
-- create a list of database names that can be used in a loop
unload to database_list.x delimiter " "
select  trim(name)
        from sysdatabases
        where name not in ( "sysmaster", "sysadmin", "sysuser", "sysutils" )
EOF

for db in `cat database_list.x`
do
echo "Results for: $db"
dbaccess $db $1 2>&1
done

rm database_list.x

} 2>&1 | tee $LOG
```

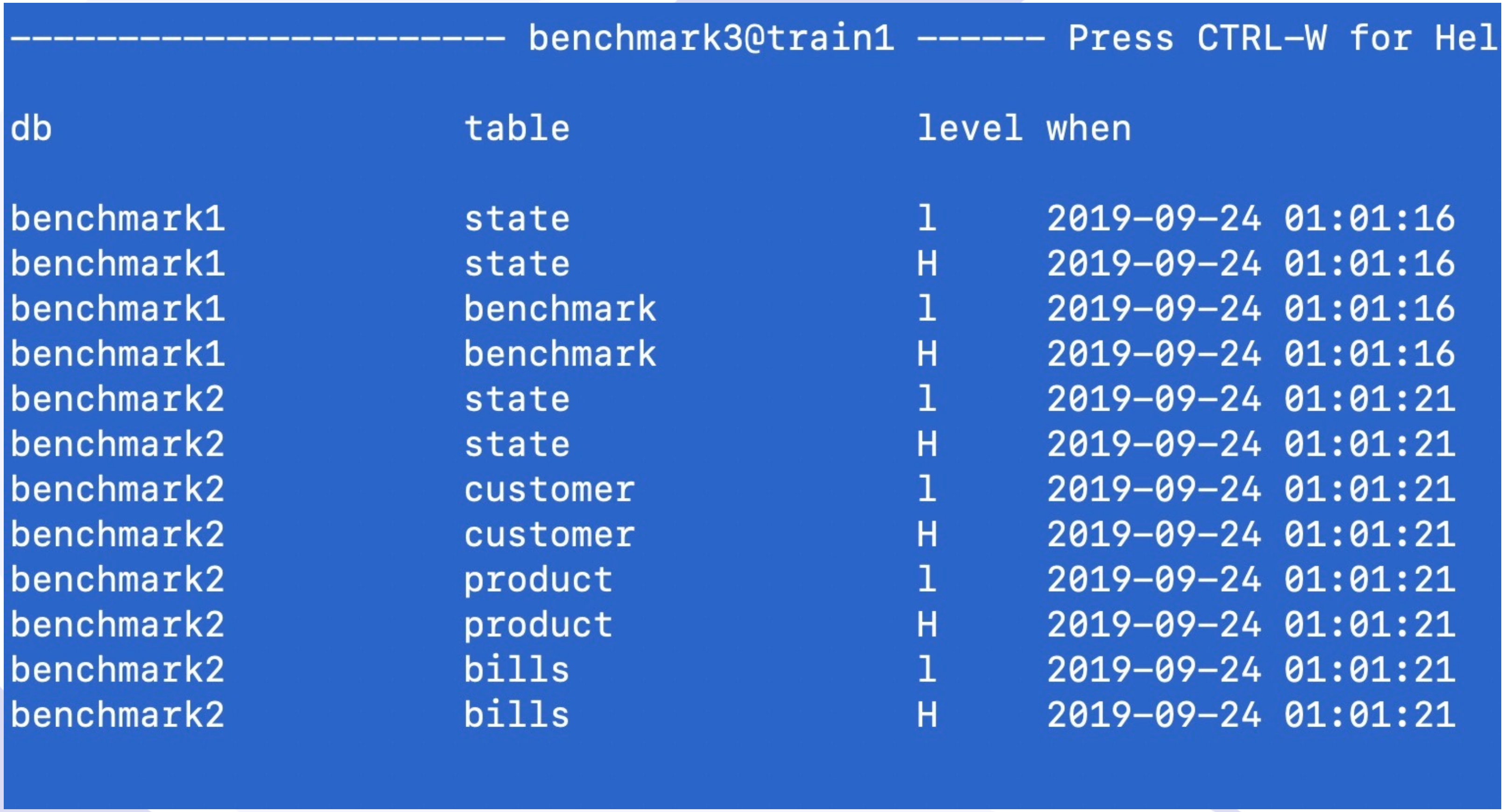
Monitoring AUS and Update Statistics

- AUS_last_run.sql
- DB_update_stats_info.sql

Update Statistics Status

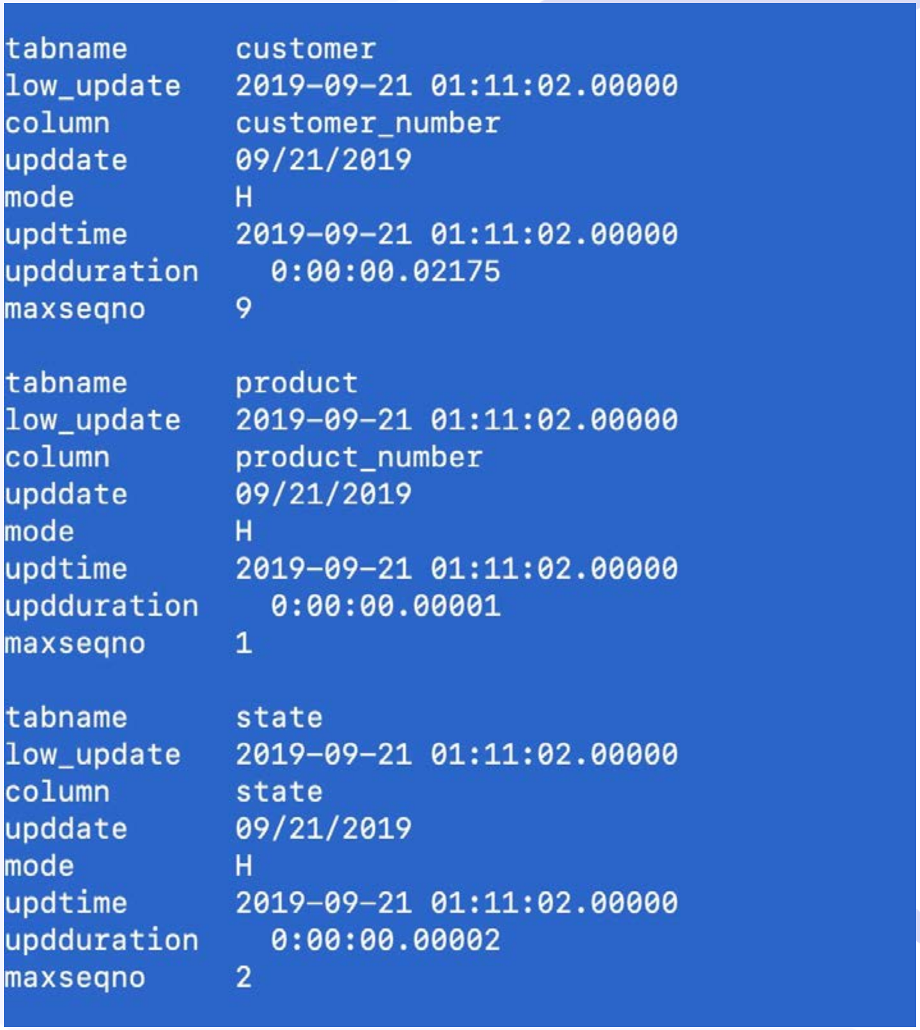
- When did Automatic Update Status Last Run?
- When did Update Status Last Run for all database and tables

Aus_last_run.sql



```
----------------------- benchmark3@train1 ------ Press CTRL-W for Hel

db                   table                level when

benchmark1           state                l     2019-09-24 01:01:16
benchmark1           state                H     2019-09-24 01:01:16
benchmark1           benchmark            l     2019-09-24 01:01:16
benchmark1           benchmark            H     2019-09-24 01:01:16
benchmark2           state                l     2019-09-24 01:01:21
benchmark2           state                H     2019-09-24 01:01:21
benchmark2           customer             l     2019-09-24 01:01:21
benchmark2           customer             H     2019-09-24 01:01:21
benchmark2           product              l     2019-09-24 01:01:21
benchmark2           product              H     2019-09-24 01:01:21
benchmark2           bills                l     2019-09-24 01:01:21
benchmark2           bills                H     2019-09-24 01:01:21
```

DB_update_stats_info.sql



```
tabname      customer
low_update   2019-09-21 01:11:02.00000
column       customer_number
upddate      09/21/2019
mode         H
updtime      2019-09-21 01:11:02.00000
updduration    0:00:00.02175
maxseqno     9

tabname      product
low_update   2019-09-21 01:11:02.00000
column       product_number
upddate      09/21/2019
mode         H
updtime      2019-09-21 01:11:02.00000
updduration    0:00:00.00001
maxseqno     1

tabname      state
low_update   2019-09-21 01:11:02.00000
column       state
upddate      09/21/2019
mode         H
updtime      2019-09-21 01:11:02.00000
updduration    0:00:00.00002
maxseqno     2
```

What are the most Costly SQL queries running?

- SQL_cost_explain.sql

- **Warning – May cause Assert Failures in 14.10.FC3 and some other versions**

The Most Costly SQL Running

- Collect a snapshot of currently running SQL and save it (once an hour)
- Summarize and review the results
- Show the Top 10 most Expensive SQL queries on your system

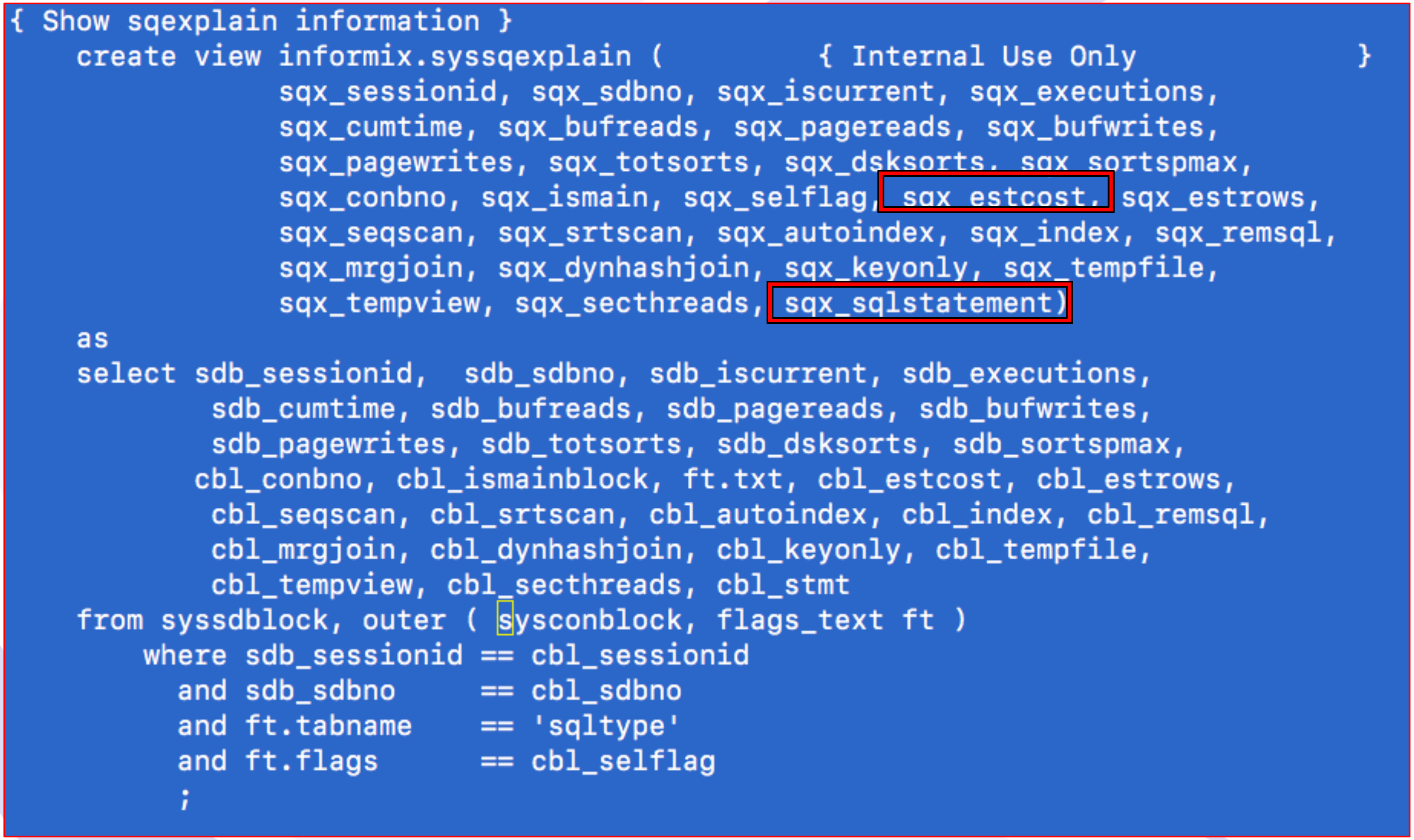
What is the Most Expensive SQL Running?

- Use SQL Trace – Real time capture of the cost of what is running (this is a separate presentation)
- Use the view Syssqexplain to capture what is running now
- Script: SQL_cost_explain.sql

What is the Most Expensive SQL Running?

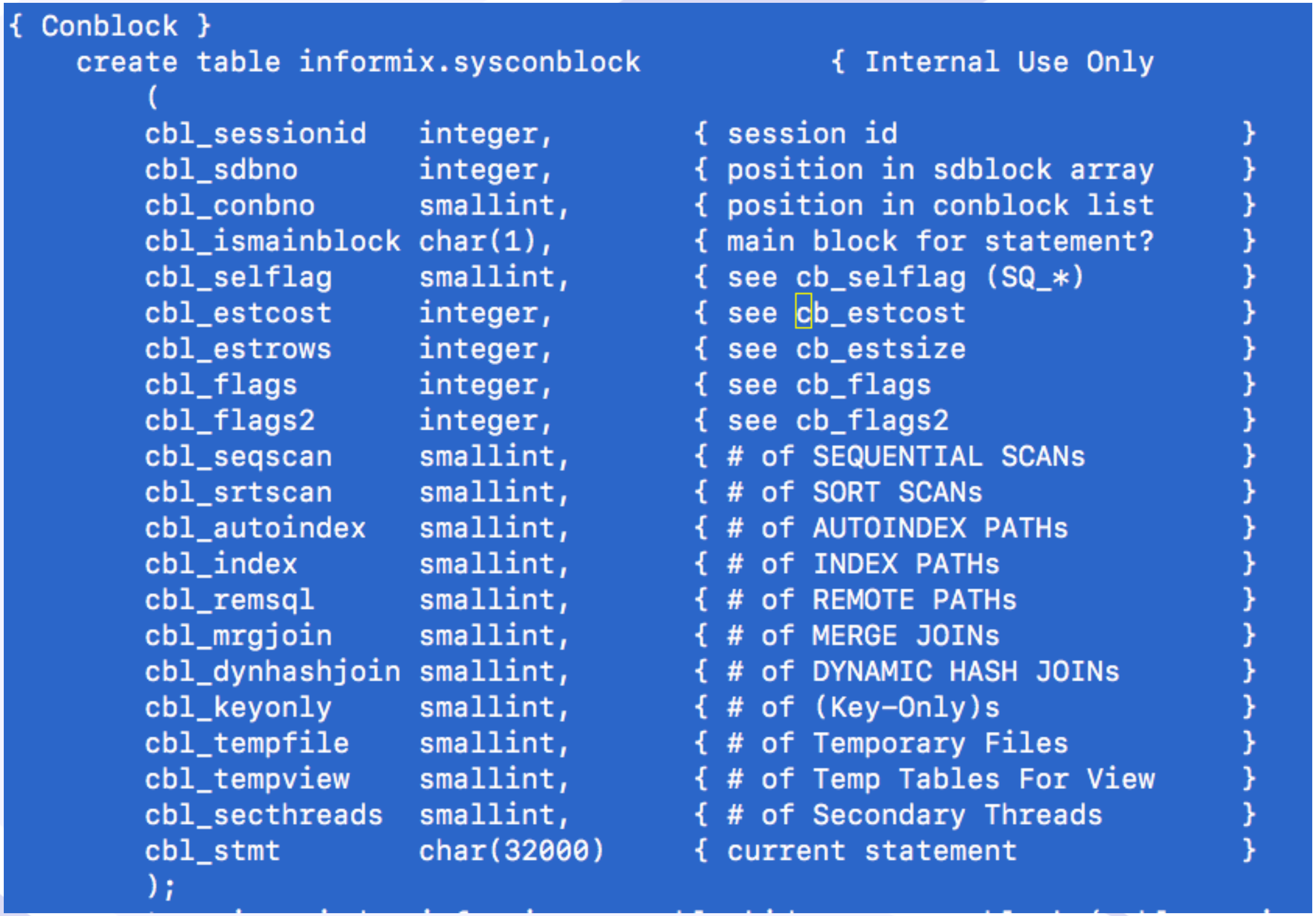
- Documented View - Syssqexplain
- Based on internal table Syssdblock and Sysconblock

View: Syssqexplain



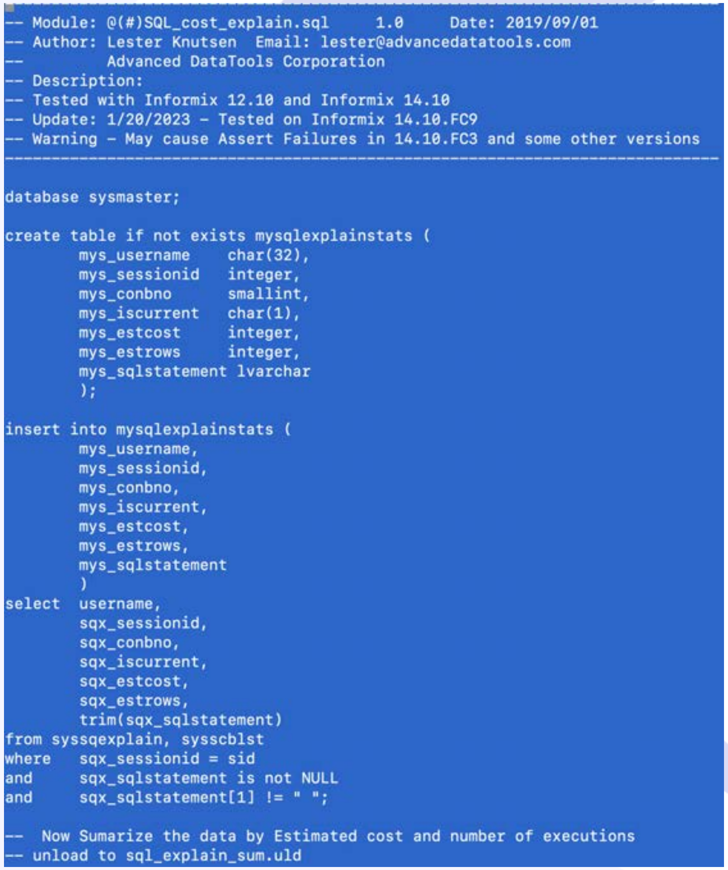
```
{ Show sqexplain information }
    create view informix.syssqexplain (         { Internal Use Only             }
                sqx_sessionid, sqx_sdbno, sqx_iscurrent, sqx_executions,
                sqx_cumtime, sqx_bufreads, sqx_pagereads, sqx_bufwrites,
                sqx_pagewrites, sqx_totsorts, sqx_dsksorts, sqx_sortspmax,
                sqx_conbno, sqx_ismain, sqx_selflag, sqx_estcost, sqx_estrows,
                sqx_seqscan, sqx_srtscan, sqx_autoindex, sqx_index, sqx_remsql,
                sqx_mrgjoin, sqx_dynhashjoin, sqx_keyonly, sqx_tempfile,
                sqx_tempview, sqx_secthreads, sqx_sqlstatement)
    as
    select sdb_sessionid,  sdb_sdbno, sdb_iscurrent, sdb_executions,
            sdb_cumtime, sdb_bufreads, sdb_pagereads, sdb_bufwrites,
            sdb_pagewrites, sdb_totsorts, sdb_dsksorts, sdb_sortspmax,
           cbl_conbno, cbl_ismainblock, ft.txt, cbl_estcost, cbl_estrows,
            cbl_seqscan, cbl_srtscan, cbl_autoindex, cbl_index, cbl_remsql,
            cbl_mrgjoin, cbl_dynhashjoin, cbl_keyonly, cbl_tempfile,
            cbl_tempview, cbl_secthreads, cbl_stmt
    from syssdblock, outer ( sysconblock, flags_text ft )
        where sdb_sessionid == cbl_sessionid
          and sdb_sdbno     == cbl_sdbno
          and ft.tabname    == 'sqltype'
          and ft.flags      == cbl_selflag
          ;
```

Internal Table: Sysconblock



```
{ Conblock }
    create table informix.sysconblock           { Internal Use Only
        (
        cbl_sessionid   integer,        { session id                    }
        cbl_sdbno       integer,        { position in sdblock array     }
        cbl_conbno      smallint,       { position in conblock list     }
        cbl_ismainblock char(1),        { main block for statement?     }
        cbl_selflag     smallint,       { see cb_selflag (SQ_*)         }
        cbl_estcost     integer,        { see cb_estcost                }
        cbl_estrows     integer,        { see cb_estsize                }
        cbl_flags       integer,        { see cb_flags                  }
        cbl_flags2      integer,        { see cb_flags2                 }
        cbl_seqscan     smallint,       { # of SEQUENTIAL SCANs         }
        cbl_srtscan     smallint,       { # of SORT SCANs               }
        cbl_autoindex   smallint,       { # of AUTOINDEX PATHs          }
        cbl_index       smallint,       { # of INDEX PATHs              }
        cbl_remsql      smallint,       { # of REMOTE PATHs             }
        cbl_mrgjoin     smallint,       { # of MERGE JOINs              }
        cbl_dynhashjoin smallint,       { # of DYNAMIC HASH JOINs       }
        cbl_keyonly     smallint,       { # of (Key-Only)s              }
        cbl_tempfile    smallint,       { # of Temporary Files          }
        cbl_tempview    smallint,       { # of Temp Tables For View     }
        cbl_secthreads  smallint,       { # of Secondary Threads        }
        cbl_stmt        char(32000)     { current statement             }
        );
```

What is the most expensive SQL running? - SQL_cost_explain.sql



```
-- Module: @(#)SQL_cost_explain.sql     1.0     Date: 2019/09/01
-- Author: Lester Knutsen  Email: lester@advancedatatools.com
--         Advanced DataTools Corporation
-- Description:
-- Tested with Informix 12.10 and Informix 14.10
-- Update: 1/20/2023 - Tested on Informix 14.10.FC9
-- Warning - May cause Assert Failures in 14.10.FC3 and some other versions
-----------------------------------------------------------------------------

database sysmaster;

create table if not exists mysqlexplainstats (
        mys_username    char(32),
        mys_sessionid   integer,
        mys_conbno      smallint,
        mys_iscurrent   char(1),
        mys_estcost     integer,
        mys_estrows     integer,
        mys_sqlstatement lvarchar
        );

insert into mysqlexplainstats (
        mys_username,
        mys_sessionid,
        mys_conbno,
        mys_iscurrent,
        mys_estcost,
        mys_estrows,
        mys_sqlstatement
        )
select  username,
        sqx_sessionid,
        sqx_conbno,
        sqx_iscurrent,
        sqx_estcost,
        sqx_estrows,
        trim(sqx_sqlstatement)
from syssqexplain, sysscblst
where   sqx_sessionid = sid
and     sqx_sqlstatement is not NULL
and     sqx_sqlstatement[1] != " ";

--  Now Sumarize the data by Estimated cost and number of executions
-- unload to sql_explain_sum.uld
```

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Output of SQL_cost_explain.sql

```
sqlstatement       INSERT INTO order_line (ol_o_id, ol_d_id, ol_w_id, ol_number,
                    ol_i_id, ol_supply_w_id,  ol_quantity, ol_amount, ol_dist_in
                   fo) VALUES (?,?,?,?,?,?,?,?,?)
sum_estcost        759986400
count_executions   200

sqlstatement       INSERT INTO OORDER  (o_id, o_d_id, o_w_id, o_c_id, o_entry_d,
                    o_ol_cnt, o_all_local) VALUES (?, ?, ?, ?, ?, ?, ?)
sum_estcost        861629
count_executions   200

sqlstatement       INSERT INTO history (h_c_d_id, h_c_w_id, h_c_id, h_d_id, h_w_
                   id, h_date, h_amount, h_data)  VALUES (?,?,?,?,?,?,?,?)
sum_estcost        680436
count_executions   200

sqlstatement       INSERT INTO NEW_ORDER (no_o_id, no_d_id, no_w_id) VALUES ( ?,
                    ?, ?)
sum_estcost        205058
count_executions   200
```

Questions?

Please ask your questions in the Chat!

Thank You

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