Advanced DataTools Webcast

from the IBM Informix Champions

Informix Tutorial
Basic Informix Server Monitoring
by Lester Knutsen

Thursday, August 20, 2020
2:00pm EDT

Advanced DataTools

Informix Tutorials Webcasts

by Lester Knutsen, IBM Informix Champion

A step by step guide to using Informix Database Servers

- Getting Started with Informix – January Replay
- Configuring a New Informix Server – February Replay
- Managing Informix Disk Space – March Replay
- Managing Informix Logs – April Replay
- Informix Backup, Recovery, and High Availability – May Replay
- Connecting Users to Informix Servers – June Replay
- Creating Databases and Tables in Informix – July Replay
- Basic Informix Server Monitoring – August Replay

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Advanced DataTools

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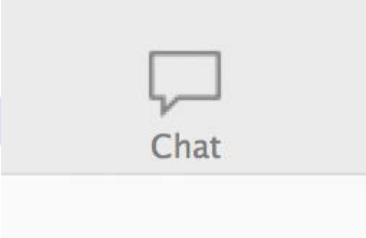
Webcast Guidelines

- The Webcast is pre-recorded. The Webcast replay and slides will be available after the broadcast.
- Please Mute your line - background sounds will distract everyone.
- Use the Chat Button in the upper right to ask questions.



Agenda
Basic Informix Monitoring

- Onstat – Discovery Options
- Onstat – Performance Ratios
- Onstat – User Sessions and Threads
- Onstat – Measuring Disk IO
- Onstat – Monitoring Locks
- Other Onstat Options
- Oncheck – Basic Dbspace Checks
- Omode – How to Terminate a Session
- InformixHQ Examples

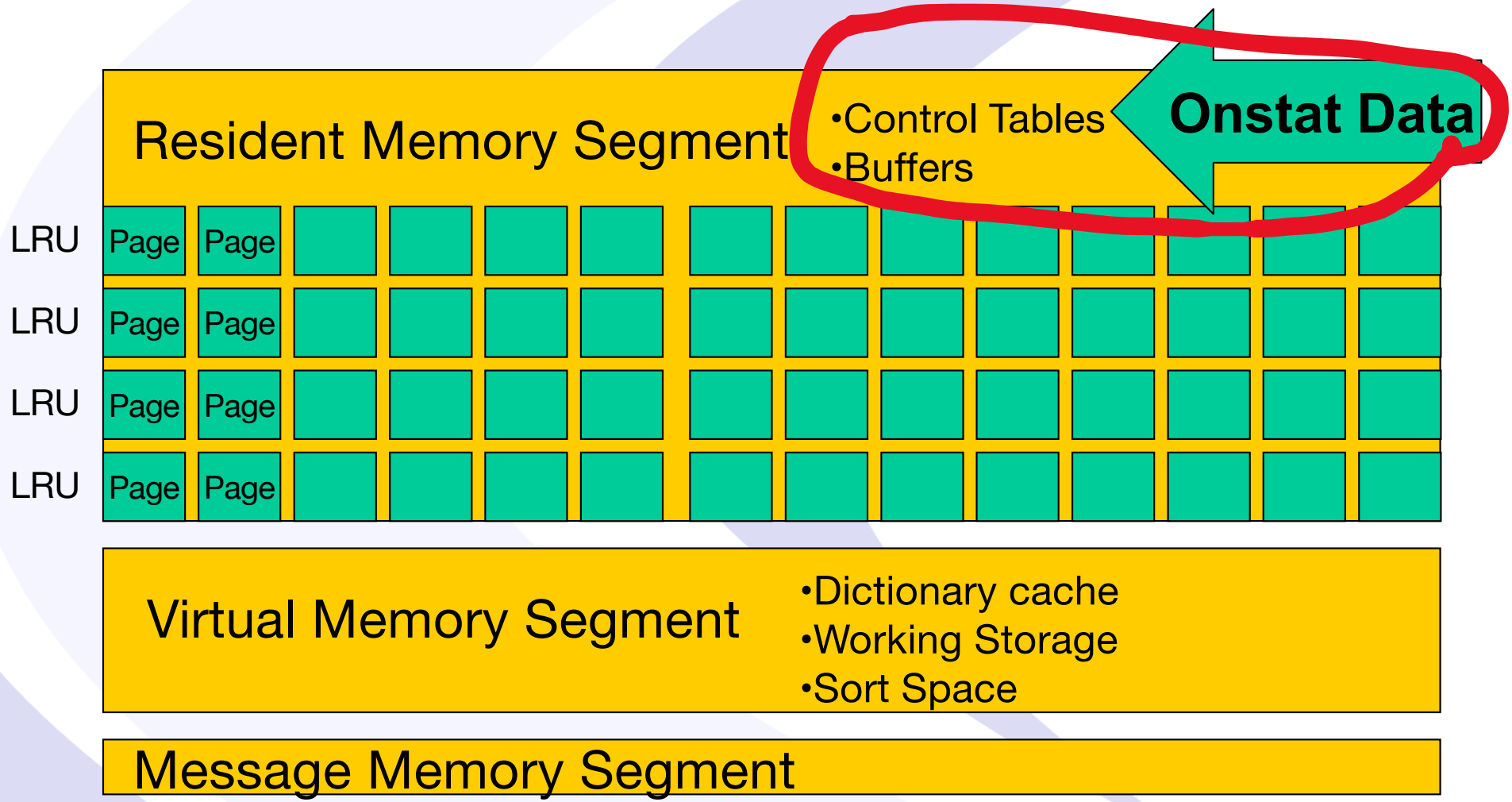
Informix Command Utilities

- ONSTAT - Shows shared memory and server statistics
- ONCHECK - Checks and repairs disk space
- ONMODE - Changes Server's operating mode and terminates User Session

Onstat – Monitor Informix Server Operations

- Onstat utility reads shared-memory structures and provides statistics about the database server at the time that the command executes.
- The contents of shared memory might change as the onstat output displays.
- The onstat utility does not place any locks on shared memory, so running the utility does not affect performance.
- Onstat is a key utility to monitor the performance of your Informix server.

Informix Shared Memory



Discover Your Informix Server

Onstat Option	Purpose
onstat -	Show version, status, and uptime of the server
onstat –g osi	Show operation system and machine info
onstat –g dis	Show known Informix servers on machine
onstat -c	Show server configuration ONCONFIG File
onstat -d	Show Informix dbspaces and chunks
onstat -l	Show logical logs status
onstat –m	Show Informix server message log
onstat -g sch	Show Informix oninit processes and classes
onstat –g seg	Show Informix memory segments

Current status of Server: onstat -

Current status: onstat -

```
informix@tiger2:~/InformixAdvclass/lab09-extra train1 > onstat -

IBM Informix Dynamic Server Version 14.10.FC4W1 -- On-Line -- Up 6 days 21:58:56 -- 3620708 Kbytes
```

Current status when Server is down

```
lester@merlin >onstat -
shared memory not initialized for INFORMIXSERVER 'merlindb'
lester@merlin >
```

Onstat Header Information

```
informix@tiger2:~/InformixAdvclass/lab09-extra train1 > onstat -

IBM Informix Dynamic Server Version 14.10.FC4W1 -- On-Line -- Up 6 days 21:58:56 -- 3620708 Kbytes
```

- Product and Version
- Mode (and Type)
- (Optional: Reason when Server is Blocked)
- Time Server has been up
- Size of Shared Memory in Kbytes

Mode of Server

- Off-Line Mode (does not show in header)
- Quiescent Mode
- On-Line Mode
- Read-Only Mode (DR Only)
- Recovery Mode
- Shutdown Mode

Reason when Server is blocked

- CKPT - Checkpoint
- LONGTX - Long transaction
- ARCHIVE - Ongoing storage-space backup
- MEDIA_FAILURE - Media failure
- HANG_SYSTEM - Database server failure
- DBS_DROP - Dropping a dbspace
- DDR - Discrete data replication (Informix)
- LBU - Logs full high-watermark

Onstat –g osi : Show Operation System Info

```
IBM Informix Dynamic Server Version 14.10.FC4W1 -- On-Line -- Up 6 days 22:12:37 --


Machine Configuration....
OS Name                                 Linux
OS Release                              3.10.0-1127.18.2.el7.x86_64
OS Node Name                            tiger2
OS Version                              #1 SMP Sun Jul 26 15:27:06 UTC 2020
OS Machine                              x86_64
Number of processors                    8
Number of online processors             8
System memory page size                 4096 bytes
System memory                           15779 MB
System free memory                      2784 MB
Number of open files per process        1024
shmmax                                  68719476736
shmmin                                  1
shmids                                  4096
shmNumSegs                              4194304
semmap                                  <<  UnSupported  >>
semids                                  128
semnum                                  128000
semundo                                 <<  UnSupported  >>
semNumPerID                             250
semops                                  100
semUndoPerProc                          <<  UnSupported  >>
semUndoSize                             20
semMaxValue                             32767
```

Onstat –g dis: Show Informix Servers

```
informix@tiger2:/opt/informix/etc train1 > onstat -g dis

IBM Informix Dynamic Server Version 14.10.FC4W1 -- On-Line -- Up 00:00:36 -- 3620708 Kbytes
There are 2 servers found
Server        : train1
Server Number : 1
Server Type   : IDS
Server Status : Up
Server Version: IBM Informix Dynamic Server Version 14.10.FC4W1
Shared Memory : 0x44000000
INFORMIXDIR   : /opt/informix
ONCONFIG      : /opt/informix/etc/onconfig.train1
SQLHOSTS      : /opt/informix/etc/sqlhosts
Host          : tiger2

Server        : train12
Server Number : 12
Server Type   : IDS
Server Status : Down
Server Version: IBM Informix Dynamic Server Version 12.10.FC13
Shared Memory : 0x44000000
INFORMIXDIR   : /opt/informix12.10.FC13
ONCONFIG      : /opt/informix12.10.FC13/etc/onconfig.train12
SQLHOSTS      : /opt/informix12.10.FC13/etc/sqlhosts
Host          : tiger2
```

Onstat –c: Show ONCONFIG File

```
IBM Informix Dynamic Server Version 14.10.FC4W1 -- On-Line -- Up 4 days 22:33:08 -

Configuration File: /opt/informix/etc/onconfig.train1
##################################################################
# Licensed Material - Property of IBM Corporation
#
# "Restricted Materials of IBM Corporation"
#
# IBM Informix Dynamic Server
# Copyright IBM Corporation 1994, 2017. All rights reserved.
#
# Title: onconfig.std
# Description: IBM Informix Dynamic Server Configuration Parameters
#
# Important: $INFORMIXDIR now resolves to the environment
# variable INFORMIXDIR. Replace the value of the INFORMIXDIR
# environment variable only if the path you want is not under
# $INFORMIXDIR.
#
# For additional information on the parameters:
# http://www.ibm.com/support/knowledgecenter/SSGU8G/welcomeIfxServers.html
##################################################################

##################################################################
# Root Dbspace Configuration Parameters
##################################################################
# ROOTNAME     - The root dbspace name to contain reserved pages and
#                internal tracking tables.
# ROOTPATH     - The path for the device containing the root dbspace
# ROOTOFFSET   - The offset, in KB, of the root dbspace into the
#                device. The offset is required for some raw devices.
# ROOTSIZE     - The size of the root dbspace, in KB.  The value of
#                200000 allows for a default user space of about
```

Onstat –d: Show DBSpaces and Chunks

```
informix@tiger2:~/InformixAdvclass/lab09-extra train1 > onstat -d

IBM Informix Dynamic Server Version 14.10.FC4W1 -- On-Line -- Up 01:03:14 -- 3620708 Kbytes

Dbspaces
address          number   flags      fchunk   nchunks  pgsize   flags    owner    name
4a949028         1        0x4020001  1        1        2048     N  BA    informix rootdbs
4be972d8         2        0x4020001  2        1        2048     N  BA    informix logdbs
4be97518         3        0x4020001  3        1        2048     N  BA    informix datadbs
4be97758         4        0x4002001  4        1        2048     N TBA    informix tmpdbs
4be97998         5        0x4020001  5        1        2048     N  BA    informix datab3dbs
 5 active, 2047 maximum

Chunks
address          chunk/dbs     offset     size       free       bpages     flags pathname
4a949268         1      1      0          1000000    734531               PO-B- /informixchunks/train1/rootdbs
4be98028         2      2      0          1000000    199947               PO-B- /informixchunks/train1/logdbs
4be99028         3      3      0          2000000    292694               PO-B- /informixchunks/train1/datadbs
4be9a028         4      4      0          1000000    999947               PO-B- /informixchunks/train1/tmpdbs
4be9b028         5      5      0          10000000   7994158              PO-B- /informixchunks/train1/datab3dbs
 5 active, 32766 maximum

NOTE: The values in the "size" and "free" columns for DBspace chunks are
      displayed in terms of "pgsize" of the DBspace to which they belong.


Expanded chunk capacity mode: always
```

Onstat -d Flags

The "flags" for Dbspaces are:

Position 1
- M - Mirrored Dbspace
- N - Not Mirrored Dbspace

Position 2
- X - Newly mirrored
- P - Physical recovery underway
- L - Logical recovery underway
- R - Recovery underway
- **D - Down**

Position 3
- B – Blobspace
- P – Plogdbs
- S – Sbspace
- T – Temporary Dbspace
- U – Temporary SBSpace
- W – Temporary Dbspace on SD Server

Position 4
- B – Chunk greater than 2GB Enabled

Position 5
- A = Auto expandable

Position 6
- E - Encrypted

The "flags" for Chunks are:

Position 1
- P - Primary
- M - Mirror

Position 2
- O - On-line
- **D - Down**
- X - Newly mirrored
- **I - Inconsistent**
- **N – Renamed and Down or Inconsistent**

Position 3
- B - Blobspace Dbspace
- T - Temporary Dbspace

Position 4
- B – Chunk greater than 2GB Enabled

Position 5
- E – Chunk is Extendable

Position 6
- - Direct IO not enabled
- C – AIX Concurrent IO enabled
- D – Direct IO Enabled

Onstat –l: Show Logs

```
informix@tiger1:~ train1 > onstat -l

IBM Informix Dynamic Server Version 14.10.FC4W1 -- On-Line -- Up 4 days 22:39:21 -- 458806

Physical Logging
Buffer bufused  bufsize  numpages   numwrits   pages/io
  P-2  13       256      1047693    5295       197.86
      phybegin         physize    phypos     phyused    %used
      5:53             1999947    2187       23         0.00

Logical Logging
Buffer bufused  bufsize  numrecs    numpages   numwrits   recs/pages pages/io
  L-1  0        256      6463943    1375390    54363      4.7        25.3
        Subsystem     numrecs    Log Space used
        OLDRSAM       6462286    2701614472
        SBLOB         122        235892
        HA            798        35112
        DDL           737        224860

address          number   flags    uniqid   begin                 size     used     %used
4ba37f88         81       U-B----- 904      6:53                                    100.00
4b395f80         82       U---C-L- 905      7:53                                    46.45
4b475ed0         83       U-B----- 898      6:500053                                00.00
4b475f38         84       U-B----- 899      7:500053              500000   500000   100.00
4b475fa0         85       U-B----- 900      6:1000053             500000   500000   100.00
4b476bf0         86       U-B----- 901      7:1000053             500000   500000   100.00
4b476c58         87       U-B----- 902      6:1500053             500000   500000   100.00
4b476cc0         88       U-B----- 903      7:1500053             500000   500000   100.00
 8 active, 8 total
```

Current Log

Onstat -l Flags

- A - New and ready to use
- B - Backed up
- C - Current logical-log file
- D - Marked for deletion
- F - Free and available for reuse
- L - Contains the last checkpoint record
- U - Used

Onstat –m: Show Message Logs

```
informix@tiger1:~ train1 > onstat -m

IBM Informix Dynamic Server Version 14.10.FC4W1 -- On-Line -- Up 4 days 22:42:59 -- 4588068 Kbytes

Message Log File: /opt/informix/train1_online.log
14:09:00  Checkpoint Statistics - Avg. Txn Block Time 0.000, # Txns blocked 0, Plog used 14, Llog used 2

14:19:00  Checkpoint Completed:  duration was 0 seconds.
14:19:00  Tue Aug 11 - loguniq 905, logpos 0x38acb018, timestamp: 0x4689dcb3 Interval: 5481

14:19:00  Maximum server connections 1
14:19:00  Checkpoint Statistics - Avg. Txn Block Time 0.000, # Txns blocked 0, Plog used 13, Llog used 6

14:24:00  Checkpoint Completed:  duration was 0 seconds.
14:24:00  Tue Aug 11 - loguniq 905, logpos 0x38b2c018, timestamp: 0x4689e5d6 Interval: 5482

14:24:00  Maximum server connections 1
14:24:00  Checkpoint Statistics - Avg. Txn Block Time 0.000, # Txns blocked 0, Plog used 346, Llog used 97

14:34:00  Checkpoint Completed:  duration was 0 seconds.
14:34:00  Tue Aug 11 - loguniq 905, logpos 0x38b32018, timestamp: 0x4689e62e Interval: 5483

14:34:00  Maximum server connections 1
14:34:00  Checkpoint Statistics - Avg. Txn Block Time 0.000, # Txns blocked 0, Plog used 23, Llog used 6
```

Using “tail -f” to continuously show the end of message log file

- Note: I like to have the OnLine log file always display in one of my windows on screen. The trick to doing this is to use the UNIX "tail" command with the "-f" option. This continually reads the last lines of a file as it is appended to. On my system I run the following command to continually monitor this log:

```
tail -f $INFORMIXDIR/online.log
```

Onstat –g sch: Show Oninit Process and Classes

```
IBM Informix Dynamic Server Version 14.10.FC4W1 -- On-Line -- Up 00:15:38 -- 36207

VP Scheduler Statistics:
 vp     pid       class      semops    busy waits  spins/wait  bsy lspins
 1      27776     cpu        73        76          9916        0
 2      27778     adm        0         0           0           0
 3      27780     lio        27297     0           0           0
 4      27781     pio        4346      0           0           0
 5      27783     aio        244474    0           0           0
 6      27785     msc        5         0           0           0
 7      27787     fifo       2         0           0           0
 8      27788     cpu        36682     123474      8768        0
 9      27790     cpu        16673     46722       9204        0
 10     27791     cpu        27399     78877       8794        0
 11     27792     soc        2         2           10000       0
 12     27793     aio        42393     0           0           0
 13     27794     aio        647       0           0           0
 14     27795     aio        522       0           0           0
 15     27796     aio        327       0           0           0

Thread Migration Statistics:
 vp     pid       class      steal-at steal-sc idlvp-at idlvp-sc inl-polls Q-ln
 1      27776     cpu        65504    1281     139      138      4606      0
 2      27778     adm        0        0        11432    2344     0         0
 3      27780     lio        0        0        14       13       0         0
 4      27781     pio        0        0        0        0        0         0
 5      27783     aio        0        0        403      398      0         1
 6      27785     msc        0        0        0        0        0         0
 7      27787     fifo       0        0        0        0        0         0
 8      27788     cpu        124584   2010     170      167      0         0
 9      27790     cpu        47970    1742     110      105      0         0
 10     27791     cpu        80117    1755     74       73       0         0
 11     27792     soc        0        0        0        0        0         0
 12     27793     aio        0        0        214      213      0         0
 13     27794     aio        0        0        3        3        0         0
 14     27795     aio        0        0        2        2        0         0
 15     27796     aio        0        0        0        0        0         0
```

Oninit Process Classes

- CPU - Executes all user and session threads and some system threads
- PIO - Handles physical log file when cooked disk space is used
- LIO - Handles logical log file when cooked disk space is used
- AIO - Handles disk I/O
- SHM - Performs shared memory communications
- TLI - Performs TLI network communications
- SOC - Performs socket network communications
- FIFO - Performs FIFO operations
- OPT - Handles optical disk I/O
- ADM - Executes administrative threads
- ADT - Executes auditing threads
- MSC - Handles request for system calls

Onstat –g seg: Show Memory Segments

```
informix@tiger2:~/InformixAdvclass/lab09-extra train1 > onstat -g seg

IBM Informix Dynamic Server Version 14.10.FC4W1 -- On-Line -- Up 00:54:55 -- 3620708 Kbytes

Segment Summary:
id          key         addr            size            ovhd      class  blkused   blkfree
32          52574801    44000000        92274688        1522840   R*     22419     109
33          52574802    49800000        204800000       2401656   V      28541     21459
34          52574803    55c00000        3409969152      1         B*     832512    0
35          52574804    121000000       561152          7848      M      136       1
Total:      -           -               3707604992      -         -      883608    21569

   (* segment locked in memory)
No reserve memory is allocated
```

Informix Memory Classes

- R – Resident Memory Segment
- B – Buffer Pool Segment for data
- V – Virtual Memory Segment for Working Storage
- M – Message Segment for communications between clients

Onstat –p: Server Profile Performance Ratios

```
informix@tiger2:~/InformixAdvclass/lab09-extra train1 > onstat -p

IBM Informix Dynamic Server Version 14.10.FC4W1 -- On-Line -- Up 6 days 22:54:37 -- 3620708 Kbytes

Profile
dskreads   pagreads   bufreads   %cached dskwrits   pagwrits   bufwrits   %cached
80253633   5381745880 18822493980 99.63   1233834722 1410498102 14179812410 91.30

isamtot    open       start      read       write      rewrite    delete     commit     rollbk
23652849285 1442693    1183716    740475509  10577320295 167987386  34360      150710     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         159140.01 51998.30 1764       2168

bufwaits   lokwaits   lockreqs   deadlks    dltouts    ckpwaits   compress   seqscans
451396     431        1969592853 0          0          747        3520091    45815

ixda-RA    idx-RA     da-RA      logrec-RA  RA-pgsused lchwaits
29336138   32926      32463935   2          18250917   14959884
```

1. Disk IO

2. Actions

3. CPU

4. Waits

5. Read Ahead

Key Elements of onstat -p

- Reads %cached - The goal is > 95%
- Writes %cached - The goal is > 85%
- The BUFFERS parameter in your ONCONFIG file will affect this value.
- **Be careful - if you make the BUFFERS too large this will take memory away from other processes and may slow down your whole system.**
- bufwaits - This indicates the number of times a user thread has waited for a BUFFER.
- lokwaits - This indicates the number of times a user thread has waited for a LOCK.
- deadlks - This should be zero. This indicates the number of times a deadlock was detected and prevented.
- dltouts - This should be zero. This indicates the number of times a distributed deadlock was detected.

Key Ratios Calculated from Onstat -p

- Disk IO - KB read and written per minute/hour
- Buffer turnover ratio per minute/hour
- Buffer wait ratio
- Read Ahead Utilization

Key Ratios - Onstat -p

	A	B	C	D	E	F	G
1	Advanced DataTools Corporation						
2	Key Ratio's from Onstat -p						
3							
4	Server Up Time:	6 days 22:54:37	(From onstat -p or the last time onstat -z was run - replace with your data)				
5	Hours Up	166.90	Please enter hours since the statistic where cleared				
6	Minutes Up	10,014.00	Please enter monites since the statistics where cleared				
7	Buffers	1,500,000	Enter number of buffers from your onconfig file				
8	Page Size KB	2	Enter the default page size for Informix on your Server (2 for Linux, Solaris, 4 for AIX, Windows)				
9	Disk IO						
10		dskreads	pagreads	bufreads	dskwrits	pagwrits	bufwrits
11	Pages: (from onstat -p)	80,253,633	5,381,745,880	18,822,493,980	1,233,834,722	1,410,498,102	14,179,812,410 (
12							
13	Kbytes	160,507,266	10,763,491,760	37,644,987,960	2,467,669,444	2,820,996,204	28,359,624,820
14							
15	KB Per Hour	961,697	64,490,664	225,554,152	14,785,317	16,902,314	169,919,861
16							
17	KB Per Minute	16,028	1,074,844	3,759,236	246,422	281,705	2,831,998
18							
19							
20	Buffer Turnover Ratio: BTR = ((bufwrits + pagreads) / BUFFERS) / <time since onstat -z last run> !! Goal < 10 per hour						
21			pagreads+bufwrits	Buffers	time	Ratio	
22			19,561,558,290	1,500,000	166.90	78.13684158	
23							
24	Bufwaits Ratio: (BR) = ((bufwaits/(pagreads + bufwrits)) * 100), !! Goal is < 7%						
25			pagreads+bufwrits	Bufwaits		Ratio	
26			19,561,558,290	451,396		0%	
27				** Enter from onstat -p**			
28							
29	Read Utilization: (RAU) = (RApgsused / (ixdaRA + idxRA + daRA)) * 100 !! Goal is 100%						
30		ixda-RA	idx-RA	da-RA	RA-pgsused	Ratio	
31		29,336,138	32,926	32,463,935	18,250,917	29.51646741	
32							
33	Note: all cells in this color must have numbers entered from your onstat-p						

User Sessions and Threads

Onstat Option	Purpose
Onstat –u	Show User Sessions Status
Onstat –x	Show User Sessions Transactions
Onstat –g sql	Show Sessions and SQL
Onstat –g ses	Show Session Details

Onstat –u: User Status

```
$ onstat -u

IBM Informix Dynamic Server Version 14.10.FC4W1 -- On-Line -- Up 4 days 22:49:54 -- 4588068 Kbytes

Userthreads
address          flags    sessid   user     tty      wait             tout locks nreads   nwrites
4b9d4028         ---P--D 1         informix -        0                0    0     748      23837
4b9d4908         ---P--F 0         informix -        0                0    0     0        1421314
4b9d51e8         ---P--F 0         informix -        0                0    0     0        2992822
4b9d5ac8         ---P--F 0         informix -        0                0    0     0        1771
4b9d63a8         ---P--F 0         informix -        0                0    0     0        126
4b9d6c88         ---P--F 0         informix -        0                0    0     0        25
4b9d7568         ---P--F 0         informix -        0                0    0     0        183
4b9d7e48         ---P--F 0         informix -        0                0    0     0        4
4b9d8728         ---P--F 0         informix -        0                0    0     0        4
4b9d9008         ---P--- 9         informix -        0                0    0     0        2004
4b9d98e8         ---P--B 10        informix -        0                0    0     3216     0
4b9da1c8         Y--P--D 11        informix -        4cbd5560         0    0     120124   0
4b9daaa8         ---P--D 12        informix -        0                0    0     0        0
4b9db388         Y--P--- 103       lester   0        4d738778         0    1     6        0
4b9dbc68         ---P--D 28        informix -        0                0    0     2        0
```

User status: onstat -u Flags

```
Flags in position 1
     B - Waiting on a buffer
     C - Waiting on a checkpoint
     G - Waiting on a logical log buffer write
     L - Waiting on a lock
     S - Waiting on a mutex
     T - Waiting on a transaction
     Y - Waiting on a condition
     X - Waiting on a transaction rollback
Flags in position 2
     * - Transaction active during I/O error
Flags in position 3
     A - Dbspace backup thread
     B - Begin work
     P - Prepared for commit work
     X - TP/XA prepared for commit work
     C - Committing work
     R - Rolling back work
     H - Heuristically rolling back work
```

User status: onstat -u Flags

```
Flags in position 4
          P - Primary thread for a session
     Flags in position 5
          R - Reading call
          X - Transaction is committing
     Flags in position 6
          None
     Flags in position 7
          B - Btree cleaner thread
          C - Cleanup of terminated user
          D - Daemon thread
          F - Page flusher thread
          M - ON-Monitor user thread
```

Onstat –x: Show Transactions

```
IBM Informix Dynamic Server Version 14.10.FC4W1 -- On-Line -- Up 11 days 22:00:35 -- 4588068 Kbytes

Transactions
                                                                                                  est.
address          flags userthread       locks  begin_logpos      current logpos    isol    rb_time  retrys coord
4ba20858         A---- 4b9e1e08         0      -                 -                 COMMIT  -        0
4ba20bc8         A---- 4b9dc548         0      -                 -                 COMMIT  -        0
4ba20f38         A---- 4b9dbc68         0      -                 -                 COMMIT  -        0
4ba212a8         A-B-- 4b9db388         706283 905:0x4eca7018    905:0x6017c168    COMMIT  00:01:30 0
4ba22068         A---- 4b9e0368         0      -                 -                 NOTRANS -        0
 26 active, 128 total, 31 maximum concurrent
```

User

Log Start

Log Now

```
onstat -l

address          number   flags    uniqid   begin                                  %used
4ba37f88         81       U-B----- 904      6:53                                   00.00
4b395f80         82       U---C-L- 905      7:53                                   78.72
4b475ed0         83       U-B----- 898      6:500053                               00.00
 8 active, 8 total
```

Current Log

Onstat –g sql: List SQL statements

```
informix@tiger1:~/Utilities train1 > onstat -g sql

IBM Informix Dynamic Server Version 14.10.FC4W1 -- On-Line -- Up 11 days 22:08:24 -- 4588


Sess       SQL            Current            Iso Lock       SQL   ISAM F.E.
Id         Stmt type      Database           Lvl Mode       ERR   ERR  Vers  Explain
160        UPDATE         benchmark2         CR  Not Wait   0     0    9.24  Off
44                        sysadmin           DR  Wait 5     0     0    -     Off
43                        sysadmin           DR  Wait 5     0     0    -     Off
42                        sysadmin           DR  Wait 5     0     0    -     Off
41                        sysadmin           CR  Not Wait   0     0    -     Off

informix@tiger1:~/Utilities train1 > onstat -g sql 160
```

Onstat –g ses: List SQL statements and more by SID

```
informix@tiger1:~/Utilities train1 > onstat -g ses 160

IBM Informix Dynamic Server Version 14.10.FC4W1 -- On-Line -- Up 11 days 22:11:16 -- 4588068 Kbytes

session           effective                              #RSAM    total      used       dynamic
id       user     user      tty      pid      hostname threads  memory     memory     explain
160      informix -         0        17867    tiger1   1        253952     224256     off

Program :
/opt/informix14.10.FC4/bin/dbaccess

tid      name     rstcb            flags    curstk   status
2301     sqlexec  4b9db388         Y-BP---  3744     cond wait  sm_read   -

Memory pools    count 2
name         class addr              totalsize  freesize   #allocfrag #freefrag
160          V     4dc06040          249856     28952      234        22
160*O0       V     4dd07040          4096       744        1          1

name             free       used         name             free       used
overhead         0          6704         scb              0          144
opentable        0          10272        filetable        0          1896
ru               0          616          log              0          16536
temprec          0          22688        keys             0          904
ralloc           0          118416       gentcb           0          1592
ostcb            0          2992         sort             0          104
sqscb            0          25744        hashfiletab      0          552
osenv            0          2472         sqtcb            0          10072
fragman          0          976          sapi             0          144
udr              0          1432

sqscb info
scb              sqscb            optofc   pdqpriority optcompind  directives
4d67a4c0         5042e028         0        0           2           1

Sess       SQL            Current            Iso Lock       SQL  ISAM F.E.
Id         Stmt type      Database           Lvl Mode       ERR  ERR  Vers  Explain
160        -              benchmark2         CR  Not Wait   0    0    9.24  Off

Last parsed SQL statement :
  update bills  set bill_notes =
    "AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA" where 1=1
```

Onstat - Show Threads

Onstat Option	Purpose
onstat -g ath	Show all threads
onstat -g rea	Show threads ready to run
onstat -g wai	Show threads waiting to run
onstat -g act	Show active threads running
onstat -g bth	Show blocking threads

Onstat –g ath: Show threads

```
IBM Informix Dynamic Server Version 14.10.FC4W1 -- On-Line -- Up 11 days 22:07:21 -- 4588068 Kbytes

Threads:
 tid      tcb              rstcb            prty status                vp-class       name
 2         4c708028         0                 1    IO Idle                3lio*         lio vp 0
 3         4c7203d8         0                 1    IO Idle                4pio*         pio vp 0
 4         4c7413d8         0                 1    IO Idle                5aio*         aio vp 0
 5         4c7623d8         1f4f6c0           1    IO Idle                6msc*         msc vp 0
 6         4c7933d8         0                 1    IO Idle                7fifo*        fifo vp 0
 7         4c82c050         0                 1    IO Idle               11aio*         aio vp 1
 8         4c84d3d8         0                 1    IO Idle               12aio*         aio vp 2
 9         4c86e3d8         0                 1    IO Idle               13aio*         aio vp 3
 10        4c88f3d8         0                 1    IO Idle               14aio*         aio vp 4
 11        4c8b03d8         0                 1    IO Idle               15aio*         aio vp 5
 12        4c8d13d8         0                 1    IO Idle               16aio*         aio vp 6
 13        4c8f23d8         0                 1    IO Idle               17aio*         aio vp 7
 14        4c913720         4b9d4028          3    sleeping secs: 1       9cpu          main_loop()
 15        4c98c028         0                 1    running                1cpu*         sm_poll
 16        4c9a4bb0         0                 1    running               18soc*         soctcppoll
 17        4c9c38b0         0                 2    sleeping forever       1cpu          sm_listen
 18        4c9fb958         0                 1    sleeping secs: 1      10cpu          sm_discon
 19        4ca13028         0                 2    sleeping forever       1cpu*         soctcplst
 20        4ca13890         4b9d4908          1    sleeping secs: 1      10cpu          flush_sub(0)
 21        4ca13bd0         4b9d51e8          1    sleeping secs: 1      10cpu          flush_sub(1)
 22        4ca65028         4b9d5ac8          1    sleeping secs: 1      10cpu          flush_sub(2)
 23        4ca65368         4b9d63a8          1    sleeping secs: 1       9cpu          flush_sub(3)
 24        4ca656a8         4b9d6c88          1    sleeping secs: 1       9cpu          flush_sub(4)
 25        4ca659e8         4b9d7568          1    sleeping secs: 1       9cpu          flush_sub(5)
 26        4ca65d28         4b9d7e48          1    sleeping secs: 1       8cpu          flush_sub(6)
 27        4cafd028         4b9d8728          1    sleeping secs: 1      10cpu          flush_sub(7)
 28        4cb370d0         4b9d9008          2    sleeping secs: 1      10cpu          aslogflush
 29        4cbd5178         4b9d98e8          1    sleeping secs: 149     9cpu          btscanner_0
 30        4cbf2370         4b9da1c8          3    cond wait  ReadAhead   8cpu          readahead_0
 31        4cc0e568         4b9daaa8          3    sleeping secs: 1      10cpu          auto_tune
 48        4d3779d0         4b9dc548          3    sleeping secs: 1       1cpu*         onmode_mon
 49        4d377d10         4b9dbc68          3    sleeping secs: 1      10cpu          periodic
 50        4d2d8d38         4b9e1528          3    sleeping forever       8cpu*         memory
 51        4d174220         4b9e1e08          3    sleeping secs: 32      9cpu          session_mgr
 60        4d219808         4b9de8c8          1    cond wait  bp_cond     1cpu          bf_priosweep()
 62        4ce66a90         4b9e0c48          1    sleeping secs: 1       9cpu          dbutil
 63        4d198568         4b9dfa88          1    sleeping secs: 74     10cpu          dbScheduler
 64        4cd3e760         4b9ddfe8          1    sleeping forever       1cpu          dbWorker1
 65        4cd62808         4b9e0368          1    sleeping forever       8cpu          dbWorker2
 2301      4f308a98         4b9db388          1    cond wait  sm_read     8cpu          sqlexec
```

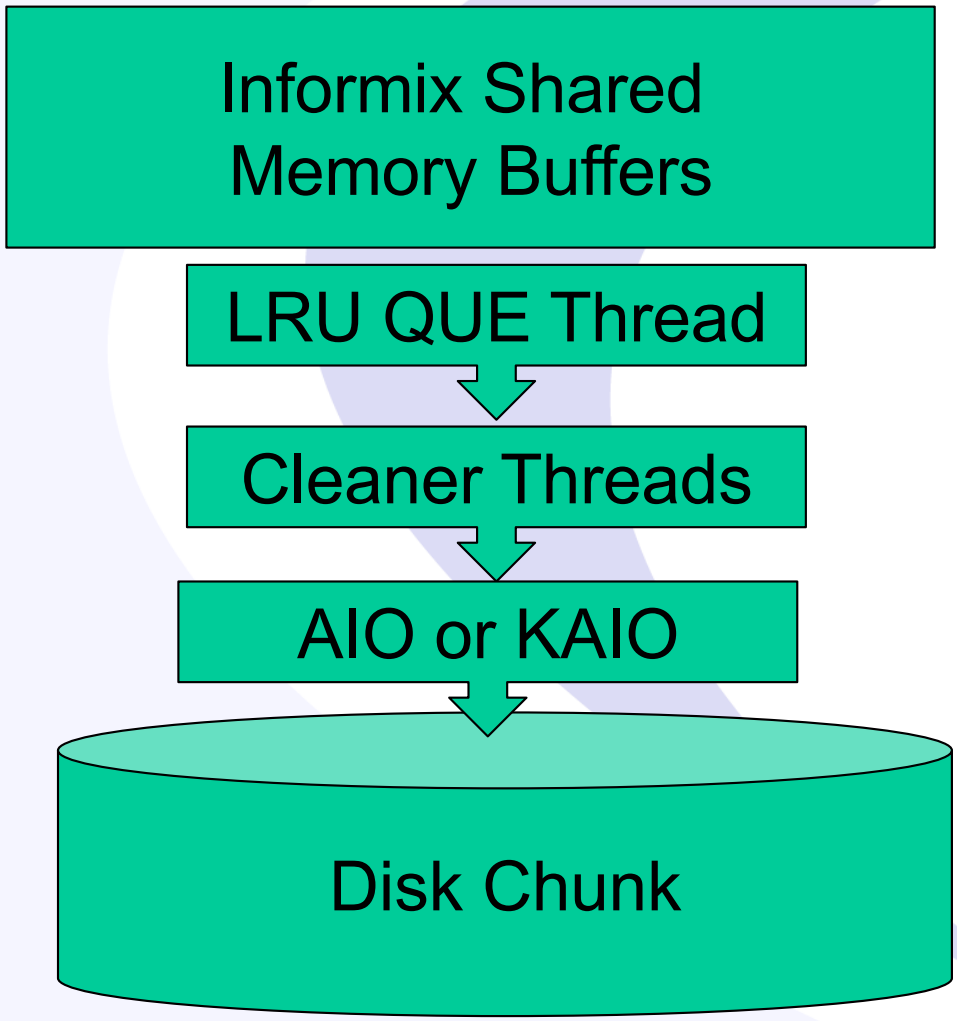
Onstat – Show Disk IO

Onstat Option	Purpose
onstat -D	Show Dbspaces and Chunk IO Statics
onstat -g iof	Show Disk IO Statistics by Chunk/file
onstat –g iov	Show Disk IO Statistics by Oninit VP
onstat –g ioh	Show Disk IO History
onstat –g ckp	Show Checkpoint Statistics
onstat -F	Show Buffer Flush Statistics
onstat -R	Show LRU Queue Statistics

Onstat –D: Disk IO

```
informix@tiger2:~/InformixAdvclass/lab09-extra train1 > onstat -D

IBM Informix Dynamic Server Version 14.10.FC4W1 -- On-Line -- Up 01:03:42 -- 3620708 Kbytes

Dbspaces
address          number   flags      fchunk   nchunks  pgsize   flags    owner    name
4a949028         1        0x4020001  1        1        2048     N  BA    informix rootdbs
4be972d8         2        0x4020001  2        1        2048     N  BA    informix logdbs
4be97518         3        0x4020001  3        1        2048     N  BA    informix datadbs
4be97758         4        0x4002001  4        1        2048     N TBA    informix tmpdbs
4be97998         5        0x4020001  5        1        2048     N  BA    informix datab3dbs
 5 active, 2047 maximum

Chunks
address          chunk/dbs     offset     page Rd  page Wr  pathname
4a949268         1      1      0          3472     1254788  /informixchunks/train1/rootdbs
4be98028         2      2      0          34       4004517  /informixchunks/train1/logdbs
4be99028         3      3      0          1773049  5770452  /informixchunks/train1/datadbs
4be9a028         4      4      0          1        4        /informixchunks/train1/tmpdbs
4be9b028         5      5      0          102066040 18069131 /informixchunks/train1/datab3dbs
 5 active, 32766 maximum

NOTE: The values in the "page Rd" and "page Wr" columns for DBspace chunks
      are displayed in terms of system base  page size.
```

Informix IO Path to Disk



Onstat –R: LRU Statistics

```
informix@tiger2:~/InformixAdvclass/lab09-extra train1 > onstat -R

IBM Informix Dynamic Server Version 14.10.FC4W1 -- On-Line -- Up 01:17:17 -- 3620708 Kbytes

Buffer pool page size: 2048

8 buffer LRU queue pairs              priority levels
# f/m   pair total     % of    length       LOW      HIGH
 0 f     187507      45.9%    86098      63254      22844
 1 m                 54.1%   101409      77379      24030
 2 f     187505      48.7%    91299      68455      22844
 3 m                 51.3%    96206      72176      24030
 4 f     187492      48.7%    91270      68425      22845
 5 m                 51.3%    96222      72192      24030
 6 F     187490      48.7%    91270      68425      22845
 7 m                 51.3%    96220      72190      24030
 8 f     187491      50.1%    93891      71046      22845
 9 m                 49.9%    93600      69570      24030
10 f     187508      52.2%    97917      75072      22845
11 m                 47.8%    89591      65561      24030
12 f     187509      50.9%    95481      72637      22844
13 m                 49.1%    92028      67998      24030
14 f     187498      52.2%    97792      74948      22844
15 m                 47.8%    89706      65676      24030
754982 dirty, 1500000 queued, 1500000 total, 2097152 hash buckets, 2048 buffer size
start clean at  55.924% (of pair total) dirty, or 104857 buffs dirty, stop at
  46.603%
```

Onstat –F: Flush to Disk

```
informix@tiger2:~/InformixAdvclass/lab09-extra train1 > onstat -F

IBM Informix Dynamic Server Version 14.10.FC4W1 -- On-Line -- Up 01:04:57 -- 3620708


Fg Writes     LRU Writes    Chunk Writes
0             14257140      10459778

address           flusher  state    data     # LRU    Chunk    Wakeups  Idle Tim
4ae9f908          0        L        5        139      30       2831     2670.530
4aea01e8          1        L        f        138      26       2776     2613.608
4aea0ac8          2        L        b        248      1        3126     2881.183
4aea13a8          3        L        9        138      1        2894     2758.065
4aea1c88          4        L        1        139      0        2917     2784.704
4aea2568          5        L        7        154      0        2902     2751.737
4aea2e48          6        L        3        1156     0        3995     2843.117
4aea3728          7        L        d        531      0        3401     2871.388
      states: Exit Idle Chunk Lru
```

Flush to Disk

- Foreground writes occur when the Server needs a buffer and must interrupt processing to flush buffers to disk to free a buffer. These are the least desirable type of writes.

- Background writes (LRU Writes) occur when a set percent of the buffers are dirty. This is controlled by the LRU parameters in the ONCONFIG file. These do not interrupt user processing and are the best for interactive systems.

- Chunk writes occur at checkpoints, and all dirty buffer pages are written to disk. The more dirty pages, the longer a checkpoint will take. Checkpoint writes are sorted and optimized, but the longer a checkpoint is, the longer it will block user activity. Checkpoint writes are best for batch systems.

Onstat –g iov: Show IO by Oninit Process

```
informix@tiger2:~/InformixAdvclass/lab09-extra train1 > onstat -g iov

IBM Informix Dynamic Server Version 14.10.FC4W1 -- On-Line -- Up 7 days 01:30:19 -- 3620708 Kb

AIO I/O vps:
class/vp/id s  io/s totalops  dskread dskwrite  dskcopy  wakeups  io/wup  errors tempops
 fifo  7  0 i   0.0        0        0        0        0        1   0.0       0        0
  msc  6  0 i   0.0      225        0        0        0      226   1.0       0      225
  aio  5  0 s 366.3 223529242 81580068 141830491        0 134882057   1.7       0     1982
  aio 12  1 i 183.2 111788672 11375742 100406075        0 24968647   4.5       0     1436
  aio 13  2 i 160.9 98206610  1483393 96717932        0 11650592   8.4       0        2
  aio 14  3 i 159.2 97148672  1522970 95622513        0 10953950   8.9       0        0
  aio 15  4 i 157.1 95840056  1211431 94625575        0 10165912   9.4       0        0
  aio 16  5 i 154.4 94195284  1150099 93042265        0  9754029   9.7       0        0
  aio 17  6 i 151.8 92617727  1317302 91297404        0  9616323   9.6       0        0
  aio 18  7 i 144.7 88318396  1553099 86762272        0  9289618   9.5       0        0
  aio 19  8 i 141.3 86206268  1062648 85140840        0  8677927   9.9       0        0
  pio  4  0 i   1.2   725912        0   725912        0   725913   1.0       0   725912
  lio  3  0 i   7.8  4753812        0  4753812        0  4753731   1.0       0  4753812
```

Onstat –g iof: Show IO by Chunk

```
informix@tiger2:~/InformixAdvclass/lab09-extra train1 > onstat -g iof

IBM Informix Dynamic Server Version 14.10.FC4W1 -- On-Line -- Up 7 days 01:30:57 -- 3620708

AIO global files:
gfd pathname          bytes read     page reads  bytes write    page writes io/s
3   rootdbs           169871360      82945       94905982976    46340812    1788.9
        op type       count          avg. time
        seeks         0              N/A
        reads         45730          0.0002
        writes        765127         0.0006
        kaio_reads    0              N/A
        kaio_writes   0              N/A

4   logdbs            75776          37          303924488192   148400629   2455.9
        op type       count          avg. time
        seeks         0              N/A
        reads         6              0.0003
        writes        4753813        0.0004
        kaio_reads    0              N/A
        kaio_writes   0              N/A

5   datadbs           160234000384   78239258    619747657728   302611161   2391.4
        op type       count          avg. time
        seeks         0              N/A
        reads         56079988       0.0000
        writes        168776194      0.0006
        kaio_reads    0              N/A
        kaio_writes   0              N/A

6   tmpdbs            8192           4           8192           4           7287.7
        op type       count          avg. time
        seeks         0              N/A
        reads         4              0.0001
        writes        3              0.0001
        kaio_reads    0              N/A
        kaio_writes   0              N/A

7   datab3dbs         11550385319936 5639836582  2051535890432  1001726509  1007.0
        op type       count          avg. time
        seeks         0              N/A
        reads         11569607       0.0036
        writes        681443758      0.0009
        kaio_reads    0              N/A
        kaio_writes   0              N/A
```

Onstat –g ioh: Show IO History by Chunk

```
IBM Informix Dynamic Server Version 14.10.FC4W1 -- On-Line -- Up 7 days 01:32:03 --

AIO global files:
gfd pathname          bytes read     page reads  bytes write    page writes io/s
3   rootdbs           169871360      82945       94906114048    46340876    1788.9

                      avg read                        avg write
      time        reads       io/s   op time    writes       io/s   op time
  14:53:35            0        0.0   0.00000         3        0.1   0.00043
  14:52:35           14        0.2   0.00022        28        0.5   0.00043
  14:51:35            0        0.0   0.00000         0        0.0   0.00000
  14:50:35            0        0.0   0.00000         0        0.0   0.00000
  14:49:35           81        1.4   0.00015         3        0.1   0.00040
  14:48:35            0        0.0   0.00000         3        0.1   0.00062
  14:47:35            8        0.1   0.00024         8        0.1   0.00027
  14:46:35            0        0.0   0.00000         0        0.0   0.00000
  14:45:35            0        0.0   0.00000         1        0.0   0.00020
  14:44:35            0        0.0   0.00000         2        0.0   0.00038
  14:43:35            0        0.0   0.00000         2        0.0   0.00037
  14:42:35           10        0.2   0.00025         7        0.1   0.00011
  14:41:35            0        0.0   0.00000         1        0.0   0.00018
  14:40:35            0        0.0   0.00000         3        0.1   0.00021
  14:39:35            0        0.0   0.00000         1        0.0   0.00249
  14:38:35            0        0.0   0.00000         4        0.1   0.00026
  14:37:35           48        0.8   0.00006        57        0.9   0.00016
  14:36:35           69        1.1   0.00010        20        0.3   0.00024
  14:35:35            0        0.0   0.00000         4        0.1   0.00014
  14:34:35            7        0.1   0.00036      3107       51.8   0.00066
  14:33:35           88        1.5   0.00013      3439       57.3   0.00057
```

Onstat –g ckp: Show Checkpoint History

```
informix@tiger2:~/InformixAdvclass/lab09-extra train1 > onstat -g ckp

IBM Informix Dynamic Server Version 14.10.FC4W1 -- On-Line -- Up 7 days 01:34:34 -- 3620708 Kbytes

AUTO_CKPTS=Off   RTO_SERVER_RESTART=Off

                                                          Critical Sections                                  Physical Log    Logical Log
          Clock                                  Total Flush Block #      Ckpt  Wait  Long  # Dirty  Dskflu  Total   Avg     Total   Avg
Interval  Time     Trigger    LSN                Time  Time  Time  Waits  Time  Time  Time  Buffers  /Sec    Pages   /Sec    Pages   /Sec
3295      14:08:07 Plog       28192:0x1690018    2.6   2.6   0.0   1      0.0   0.0   0.0   184575   71954   187500  23437   220949  27618
3296      14:09:42 Plog       28267:0x126b2f8    7.6   7.6   0.3   1      0.0   0.0   0.0   340552   44914   187500  2083    784223  8713
3297      14:12:16 *User      28308:0x606018     0.0   0.0   0.0   1      0.0   0.0   0.0   7        7       48258   299     406827  2526
3298      14:12:17 *Backup    28308:0x611018     0.0   0.0   0.0   0      0.0   0.0   0.0   4        4       111     111     11      11
3299      14:12:18 Backup     28308:0x613158     0.0   0.0   0.0   0      0.0   0.0   0.0   0        0       0       0       2       2
3300      14:17:31 CKPTINTVL  28308:0xce8018     8.4   8.4   0.0   1      0.0   0.0   0.0   339420   40620   278     0       1749    5
3301      14:24:14 CKPTINTVL  28308:0xcf1018     103.6 103.5 0.0   1      0.0   0.1   0.1   430877   4164    444     1       9       0
3302      14:27:48 CKPTINTVL  28308:0xd9b488     4.8   4.8   0.0   0      0.0   0.0   0.0   319271   66536   390     1       170     0
3303      14:32:35 *Backup    28308:0xdb4018     0.0   0.0   0.0   0      0.0   0.0   0.0   14       14      68      0       25      0
3304      14:32:36 Backup     28308:0xdb6158     0.0   0.0   0.0   0      0.0   0.0   0.0   0        0       0       0       2       2
3305      14:32:47 Plog       28326:0x92c034     2.3   2.3   0.0   1      0.0   0.0   0.0   184576   79967   187500  23437   205761  25720
3306      14:34:14 Plog       28402:0xd7e0a4     9.5   9.5   2.7   1      0.0   0.0   0.0   307986   32523   187500  2343    787651  9845
3307      14:36:52 *User      28441:0x1fbd018    0.0   0.0   0.0   1      0.0   0.0   0.0   10       10      36566   217     394671  2349
3308      14:36:53 *Backup    28441:0x1fc8018    0.0   0.0   0.0   0      0.0   0.0   0.0   4        4       112     112     11      11
3309      14:36:54 Backup     28441:0x1fca158    0.0   0.0   0.0   0      0.0   0.0   0.0   0        0       0       0       2       2
3310      14:42:02 CKPTINTVL  28441:0x269f018    8.1   8.1   0.0   1      0.0   0.0   0.0   320428   39696   285     0       1749    5
3311      14:47:15 CKPTINTVL  28441:0x26a8018    14.0  13.8  0.0   1      0.0   0.2   0.2   384681   27915   414     1       9       0
3312      14:52:32 CKPTINTVL  28442:0x67388      17.0  17.0  0.0   0      0.0   0.0   0.0   307861   18097   464     1       207     0
3313      14:56:48 *Backup    28442:0x76018      0.0   0.0   0.0   0      0.0   0.0   0.0   12       12      232     0       15      0
3314      14:56:49 Backup     28442:0x78158      0.0   0.0   0.0   0      0.0   0.0   0.0   0        0       0       0       2       2

Max Plog      Max Llog      Max Dskflush   Avg Dskflush   Avg Dirty      Blocked
pages/sec     pages/sec     Time           pages/sec      pages/sec      Time
10240         1280          205            43428          6391           19

Based on the current workload, the physical log might be too small
to accommodate the time it takes to flush the buffer pool during
checkpoint processing.  The server might block transactions during checkpoints.
If the server blocks transactions, increase the physical log size to
at least 716800 KB.
```

LOCKS

- Onstat –k to Show Locks
- How many Lock Table overflows?
- What User Owns the Lock?
- What Table is Locked?
- What Type of Lock is it?

Onstat –k: Show Locks

- WARNING: If you have a large number of LOCKS defined in your ONCONFIG file and many users, you could see thousands of rows from this command.

```
informix@tiger1:~/Utilities train1 > onstat -k

IBM Informix Dynamic Server Version 14.10.FC4W1 -- On-Line -- Up 11 days 23:10:36 -- 4588068 Kbytes

Locks
address          wtlist           owner            lklist           type     tblsnum  rowid    key#/bsiz DML table_name
44419028         0                4b9e0c48         0                HDR+S    100002   204         0          sysmaster:informix.sysdatabases
44c7bb10         0                4b9db388         492bc900         HDR+X    30008e   3601        0      U   benchmark2:informix.customer
46d9a028         0                4b9dfa88         0                    S    100002   204         0          sysmaster:informix.sysdatabases
46d9a0b0         0                4b9dfa88         46d9a028         HDR+S    100002   201         0          sysmaster:informix.sysdatabases
4825a828         0                4b9ddfe8         0                    S    100002   204         0          sysmaster:informix.sysdatabases
4825aad0         0                4b9e0368         0                    S    100002   204         0          sysmaster:informix.sysdatabases
492a5eb0         0                4b9db388         0                HDR+S    100002   206         0          sysmaster:informix.sysdatabases
492bc900         0                4b9db388         492a5eb0         HDR+IX   30008e   0           0          benchmark2:informix.customer
 8 active, 1280000 total, 65536 hash buckets, 1 lock table overflows
```

Lock Table Overflow Need To Increase LOCKS

New in 14.10

Who owns a lock

- The "owner" column lists the address in shared memory of the user who owns a lock. Use this with "onstat -u" to see all users and compare this with the "address" column to identify username of the owner.

```
IBM Informix Dynamic Server Version 14.10.FC4W1 -- On-Line -- Up 11 days 23:10:36 -- 4588068

Locks
address          wtlist           owner            lklist           type     tblsnum  rowid
44419028         0                4b9e0c48         0                HDR+S    100002   204
44c7bb10         0                4b9db388         492bc900         HDR+X    30008e   3601
46d9a028         0                4b9dfa88         0                    S    100002   204
46d9a0b0         0                4b9dfa88         46d9a028         HDR+S    100002   201
4825a828         0                4b9ddfe8         0                    S    100002   204
4825aad0         0                4b9e0368         0                    S    100002   204
492a5eb0         0                4b9db388         0                HDR+S    100002   206
492bc900         0                4b9db388         492a5eb0         HDR+IX   30008e   0
 8 active, 1280000 total, 65536 hash buckets, 1 lock table overflows

informix@tiger1:~/Utilities train1 > onstat -u | grep  4b9db388
4b9db388         Y-BP--- 162      informix 1       4cf4f4c0         0    3     8        0
informix@tiger1:~/Utilities train1 >
```

What table is locked?

- The "tblsnum" column identifies the table that is being locked. Compare this with the output of the following SQL statement to convert a table's partnum to hex. This will identify which table is locked.

```
1.  Find a list of tblsnum
dbaccess database - <<EOF
     select tabname, hex(partnum) tblsnum
     from systables where tabid > 99;
EOF

database selected

tabname              tblsnum
genjournal          0x0010009E
gjsum               0x0010009F
```

What table is locked?

2. Find what is locked

```
onstat -k

Locks
address  wtlist   owner    lklist   type     tblsnum  rowid    key#/bsiz
a103e44  0        a2d1118  a103de4  HDR+X    10009f   0           0
 3 active, 20000 total, 16384 hash buckets
```

3. Compare tblsnum from step 1 and step 2.

This identifies the table gjsum as the one that is locked.

- The tblsnum 100002 has a special meaning. This indicates a database lock. Every user who opens a database will place a shared lock on the database.

Types of locks

- Database - Lock on tablespace 100002
- Table - Lock on actual tablespace with rowid of 0
- Page - Lock on tablespace with rowid ending in 00
- Row - Lock on tablespace with actual rowid (not 00)
- Byte - Lock on tablespace/page with size of bytes
- Key - Lock on tablespace hex rowid (starting with f)

Types of locks Flags

HDR	- Header
B	- Bytes lock
S	- Shared lock
X	- Exclusive
I	- Intent
U	- Update
IX	- Intent-exclusive
IS	- Intent-shared
SIX	- Shared, Intent-exclusive

More Onstat Options

Onstat Option	Purpose
onstat -r	Repeat every <seconds> seconds (default: 5)
onstat -z	Zero profile counts
onstat -o	Put shared memory into specified dump file
onstat <infile>	Read shared memory information from specified dump file
onstat -i	Interactive mode

Onstat –r: Repeat

Repeat ONSTAT commands: -r

- To continually repeat an ONSTAT command use the "-r # of seconds" option. This is very useful when you need to monitor a situation. The following example displays the status of the logical logs every 10 seconds.

onstat -l -r 10

Onstat –z: Reset Statistics

Clear ONSTAT shared memory statistics: onstat -z

- The Server statistics are reset every time OnLine is restarted. To reset all the statistics while OnLine is running without shutting it down, use the following command:

onstat -z

Onstat – Reading from a Memory Dump

- onstat –o filename - to create a Dump of Shared Memory
- onstat –i filename – to interactive read and run onstat commands on the Dump of Shared Memory
- Useful for Debugging

Onstat – Reading from a Memory Dump

```
informix@tiger1:~/Utilities train1 > ls -l onstat.save
-rw-rw-r--. 1 informix informix 4698181632 Aug 11 14:25 onstat.save
informix@tiger1:~/Utilities train1 > onstat onstat.save -i

IBM Informix Dynamic Server Version 14.10.FC4W1 -- On-Line -- Up 4 days 22:42:57 -- 4588068 Kbytes
onstat> p

IBM Informix Dynamic Server Version 14.10.FC4W1 -- On-Line -- Up 4 days 22

Profile
dskreads   pagreads   bufreads   %cached dskwrits   pagwrits   bufwrits   %cached
1126538    1061257    96309123   98.83   4478680    4636224    8809476    49.16

isamtot    open       start      read       write      rewrite    delete     commit     rollbk
82554736   490002     435201     62100916   1300394    1431308    24141      42138      0

gp_read    gp_write   gp_rewrt   gp_del     gp_alloc   gp_free    gp_curs
5          1          10         0          0          0          2

ovlock     ovuserthread ovbuff     usercpu  syscpu   numckpts   flushes
0          0            0          19910.40 3178.56  799        1602

bufwaits   lokwaits   lockreqs   deadlks    dltouts    ckpwaits   compress   seqscans
1940       0          21633962   0          0          5          48299      16330

ixda-RA    idx-RA     da-RA      logrec-RA  RA-pgsused lchwaits
4172       1233243    117034     2          118602     18235
onstat>
```

Saved Memory Dump

Onstat –P

Interactive Mode

Oncheck - Check and Print Disk Space

Oncheck Command	Purpose
oncheck –pr or cr	Check Server Reserved Pages
oncheck -pe	Show Extents by Chunk
oncheck –cc database	Check Database System Catalogs
oncheck –cDI database:table	Check ALL Rows and Indexes
oncheck –cs	Check Smart Large Objects
oncheck -cS	Check Smart Large Objects and Extents
oncheck -pT	Show Table and Index Partition Information

Oncheck - Check and Print Disk Space

- ONCHECK is the tool to check and display information about your dbspaces, blobspaces, chunks, tables, indexes, and disk pages.
- The purpose of this utility is to ensure that your database server disk space has no inconsistencies.
- ONCHECK operates in two basic modes with two basic options.
  - The '-c' list of options perform consistency checks and display a limited amount of information unless there is a problem.
  - The '-p' list of options perform the consistency checks and display much more information about what you selected.
- When ONCHECK finds a problem it will provide you with an error message to indicate what the problem is. If the problem is a corrupt index, ONCHECK will prompt you to tell it to fix the index.
- The only problem ONCHECK can fix is corrupt indexes. However, it may be faster to drop and re-create the index using SQL commands than for ONCHECK to fix it.
- ***ONCHECK will place locks on all tables and databases that it needs to access.***

Oncheck –cc: Checking Reserved Pages

- The first 12 pages of the rootdbs contain crucial information the Server needs to operate.
- If these pages are damaged, your database server cannot operate.

```
informix@tiger1:~/Utilities train1 > oncheck -cr

Validating IBM Informix Dynamic Server reserved pages

    Validating PAGE_PZERO...

    Validating PAGE_CONFIG...


    Validating PAGE_1CKPT & PAGE_2CKPT...
          Using check point page PAGE_1CKPT.

    Validating PAGE_1DBSP & PAGE_2DBSP...
          Using DBspace page PAGE_1DBSP.

    Validating PAGE_1PCHUNK & PAGE_2PCHUNK...
          Using primary chunk page PAGE_2PCHUNK.

    Validating PAGE_1MCHUNK & PAGE_2MCHUNK...
          Using mirror chunk page PAGE_2MCHUNK.

    Validating PAGE_1ARCH & PAGE_2ARCH...
          Using archive page PAGE_1ARCH.
```

Oncheck –cc Database: Checking System Tables

- The System Tables are the key structures which define all the tables, columns, indexes, stored procedures, and constraints for a database.
- This option checks, or checks and displays, the consistency of these structures.

```
informix@tiger1:~/Utilities train1 > oncheck -cc benchmark1

Validating database benchmark1

    Validating systables for database benchmark1

    Validating syscolumns for database benchmark1

    Validating sysindices for database benchmark1

    Validating systabauth for database benchmark1

    Validating syscolauth for database benchmark1

    Validating sysdepend for database benchmark1

    Validating syssyntable for database benchmark1

    Validating sysviews for database benchmark1

    Validating sysconstraints for database benchmark1
```

Oncheck –pe: Checking and Printing Storage Extents

- This option shows how your tables are spread out over chunks. It produces a report by dbspace and chunk, listing each extent for each table with the starting address and size.

```
DBspace Usage Report: rootdbs            Owner: informix  Created: 07/11/2020


 Chunk Pathname                                    Pagesize(k)  Size(p)  Used(p)  Free(p)
     1 /informixchunks/train1/rootdbs                 2  1000000    29309   970691

 Description                                                   Offset(p)  Size(p)  Partnum  Ext Num
 ------------------------------------------------------------ -------- -------- ---------- --------
 RESERVED PAGES                                                       0       12
 CHUNK FREELIST PAGE                                                 12        1
 rootdbs:'informix'.TBLSpace                                         13      250 0x00100001        1
 sysadmin:'informix'.ph_alert                                       263      128 0x001000c7        5
 sysadmin:'informix'.aus_cmd_info_index1                            391        4 0x00100261        1
 sysadmin:'informix'.ix_ph_run_03                                   395       16 0x001000c6        4
 sysadmin:'informix'.mon_sysenv                                     411       16 0x001001a0        3
 FREE                                                               427        2
 sysadmin:'informix'.mon_chunk                                      429        8 0x0010019f        2
 sysadmin:'informix'.idx_mon_ckpt_1                                 437        4 0x0010019a        2
 sysadmin:'informix'.mon_syssqltrace                                441        8 0x001000e9        2
 sysadmin:'informix'.mon_syssqltrace_hvar                           449        8 0x001000e1        2
 sysadmin:'informix'.aus_cmd_info                                   457        8 0x00100260        1
 sysadmin:'informix'.aus_cmd_info_index2                            465        6 0x00100262        1
```

Oncheck –cDI Database:Table

- When Index Errors are discovered, it may be faster to drop and rebuild the Index using SQL

```
informix@tiger1:~/Utilities train1 > oncheck -cDI benchmark1:zip

Validating indexes for benchmark1:informix.zip...
                Index  101_2
                  Index  fragment partition datadbs in DBspace datadbs
                Index idx_zip_1
                  Index  fragment partition datadbs in DBspace datadbs
                Index idx_zip_2
                  Index  fragment partition datadbs in DBspace datadbs

TBLspace data check for benchmark1:informix.zip
```

Onmode – How to Terminate a User Thread

- Do NOT Use UNIX command “Kill -9” (The Server may not rollback the transaction correctly)
- Onmode must be run by the User Informix or DBSA

Terminate a User Thread

- Onmode provides an option to kill and abort an individual user's database process.
- Onmode is aware of a user's database transaction and will rollback any work that was not committed.
- Operating system commands to kill a user's process (e.g. the UNIX kill -9 command) are not aware of a user's database connection and may not cleanly rollback their work. This can lead to corruption of tables or indexes.

Terminate a User Thread

The correct procedure to kill a user's database process is:

1. Identify the user's session id using the ONSTAT command with one of the following three options:

   onstat -u

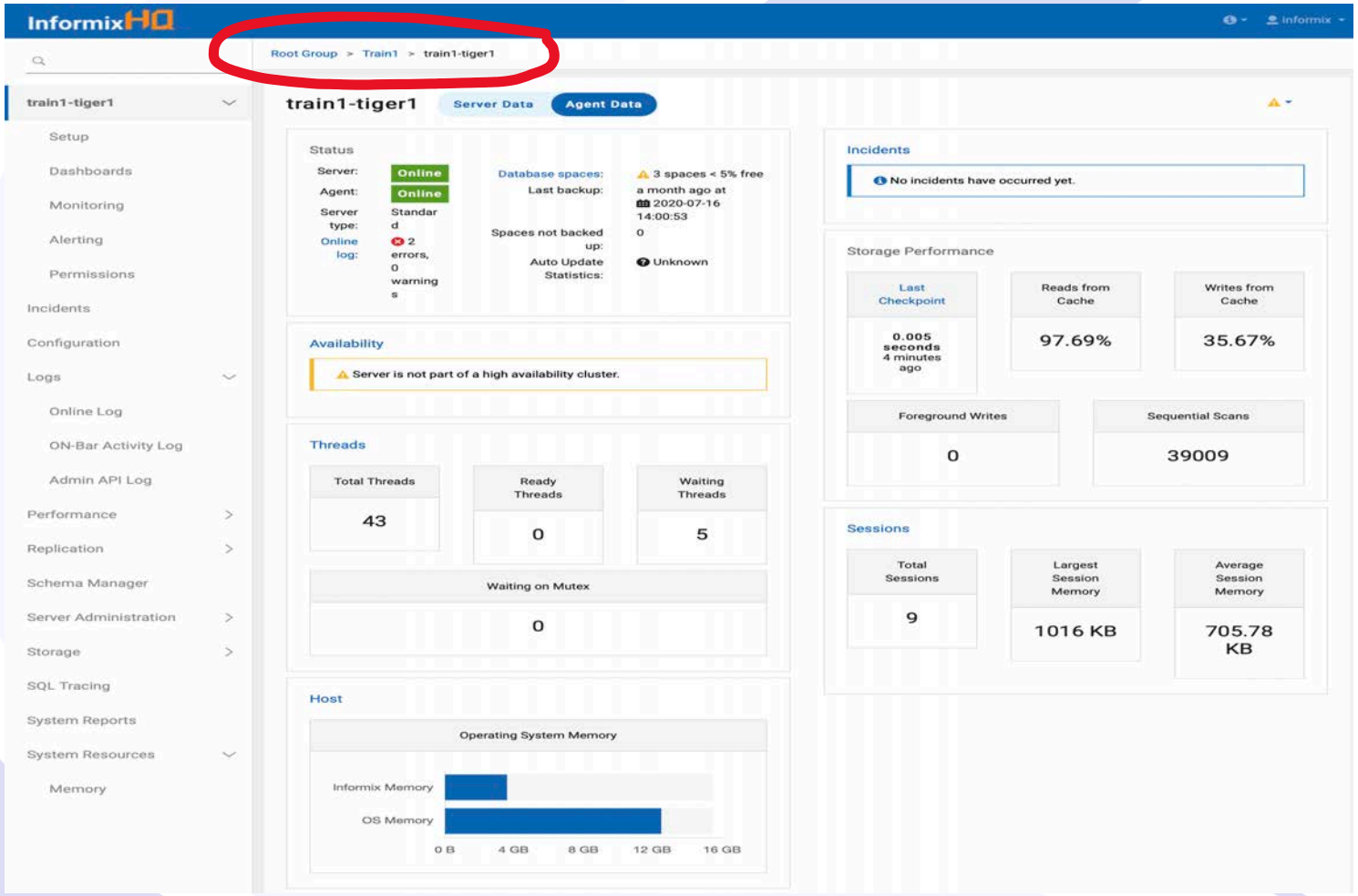
   onstat -g sql

   onstat -g ses

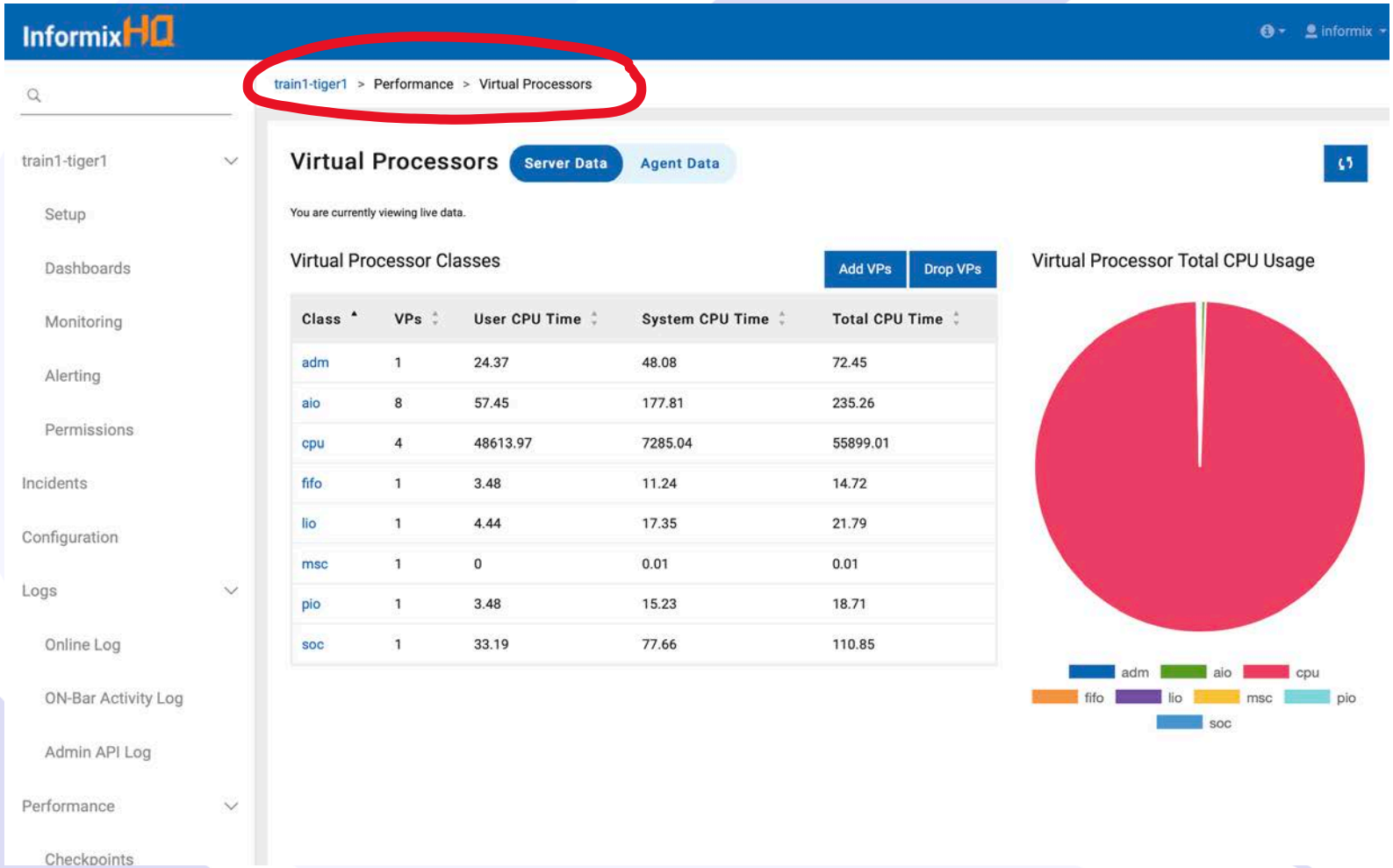
2. Use the following onmode command to terminate the user's session:

   onmode -z session_id

Using InformixHQ – Basic Infomation

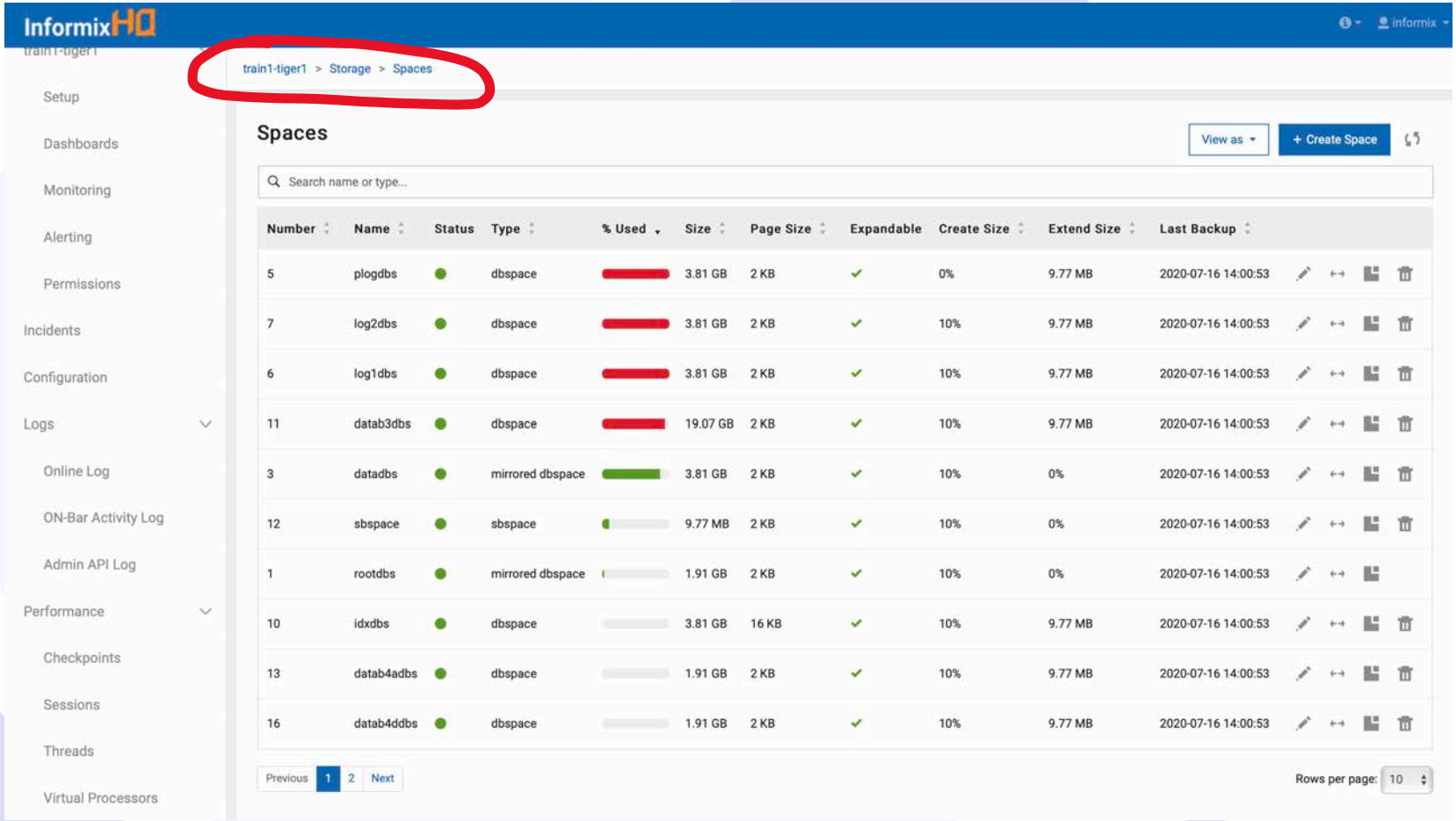


Using InformixHQ – Monitoring Virtual Processors



Class	VPs	User CPU Time	System CPU Time	Total CPU Time
adm	1	24.37	48.08	72.45
aio	8	57.45	177.81	235.26
cpu	4	48613.97	7285.04	55899.01
fifo	1	3.48	11.24	14.72
lio	1	4.44	17.35	21.79
msc	1	0	0.01	0.01
pio	1	3.48	15.23	18.71
soc	1	33.19	77.66	110.85

Using InformixHQ – Monitoring Storage



Using the SQL API Function in Dbaccess or InformixHQ

```
SQL:   New  Run  Modify  Use-editor  Output  Choose  Save  Info  Drop
Run the current SQL statements.

---------------------- benchmark1@train1 ------ Press CTRL-W for Help


-- Onstat Commands using the SQL API in dbaccess or InformixHQ

execute function sysadmin:task ("onstat", "-g osi" );
execute function sysadmin:task ("onstat", "-g dis" );
execute function sysadmin:task ("onstat", "-g seg" );
execute function sysadmin:task ("onstat", "-p" );
execute function sysadmin:task ("onstat", "-F" );
execute function sysadmin:task ("onstat", "-d" );


-- Oncheck Command using the SQL API
execute function sysadmin:task ("check extents" );

-- Onmode Command to terminate a user Session
execute function sysadmin:task ("onmode", "-z" "1000" );
```

Questions?

Send follow-up questions to
Lester@advancedatatools.com

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- Managing Informix Logs – April Replay
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