

SERVICE REPORT

SAP® IQ Weekly DB Health Check Template



Version 12.0

SAP System ID	ABC
SAP Product	Sybase IQ
Release	16.0
DB System	IQ16 SPXX PLXX
Operating System	Linux x86_64
Customer	

Date of Session	XX.XX.2017
Date of Report	XX.XX.2017
Author	Amit Agarwal
Mail	

Installation No.	
Customer No.	XXYYZZ

Month Dayth Year

IQ Weekly Health Check Report Template

Dear Sir/Madam,

The IQ weekly Health check report focus is database overview and analyzes of your system configuration on database, in order to provide recommendations for improving system response time.

If you have any questions or concerns, do not hesitate to contact us.

Yours sincerely,

Amit Agarwal
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1 Report Summary

1.1 Summary

The **primary goal** of the IQ Health check report is focus Database configuration and system performance monitor. This report covers the findings of the IQ system parameter and configuration overview during the period of 'Month Day – Day, Year'.





Most of the scripts & store procedure call in this report are either SA inbuilt store procedure (starting with "sa_") while others are standard IQ inbuilt store procedures (with "_iq*")

Please review this detailed report

1.2 Action Plan

The following tables contain a list of recommendations provided in this report.

CRITERIA FOR SETTING PRIORITIES

Priority	Description
 Very high	Has or will have critical impact on business operations (possible financial loss)
 High	Has or will have serious impact on business operations
 Medium	Has or will have some impact on business operations
 Low	Has or will have minor impact on business operations

The following table contains recommendations on issues identified on IQ database system:

No	Priority	Area	Issue	Action / Recommendation
8.1	2	System Performance		
8.2	1	Configuration		

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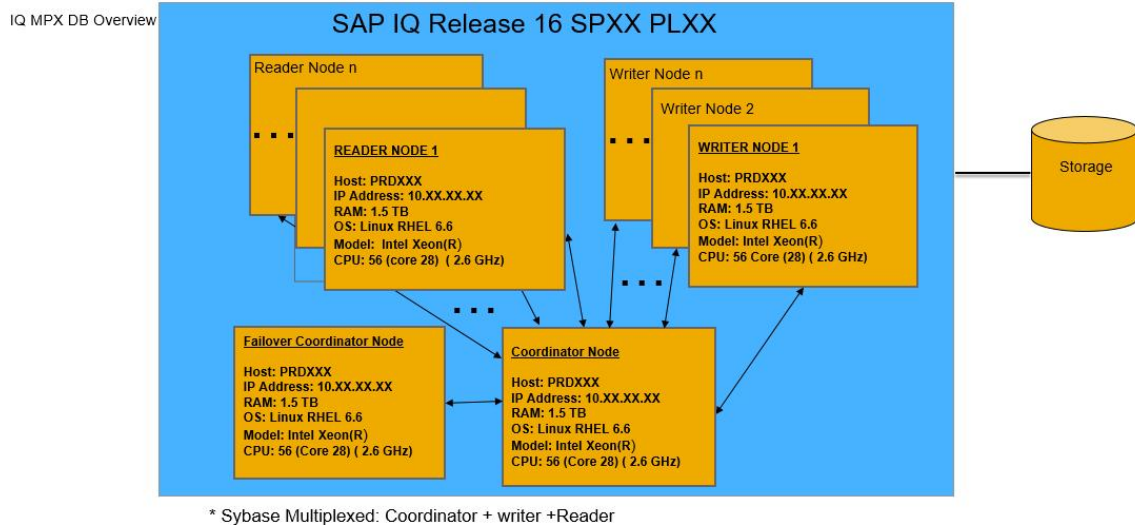
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3 Landscape

3.1 IQ Current Production Landscape diagram



3.2 IQ Current Landscape

DB SERVERS

SID	Host	Logical Host (SAPDBHOST)	DB Instance Name	MPX Mode
ABC	XYZC01	XYZC01	XYZC01	coordinator
ABC	XYZW02	XYZW02	XYZW02	writer
ABC	XYZW09	XYZW09	XYZW09	reader
ABC	XYZC02	XYZC02	XYZC02	writer
ABC	XYZW10	XYZW10	XYZW10	writer
ABC	XYZW01	XYZW01	XYZW01	writer
ABC	XYZW11	XYZW11	XYZW11	writer
ABC	XYZW12	XYZW12	XYZW12	writer
ABC	XYZW13	XYZW13	XYZW13	writer
ABC	XYZW14	XYZW14	XYZW14	writer
ABC	XYZW03	XYZW03	XYZW03	writer
ABC	XYZW15	XYZW15	XYZW15	writer
ABC	XYZW06	XYZW06	XYZW06	writer
ABC	XYZW07	XYZW07	XYZW07	writer
ABC	XYZW08	XYZW08	XYZW08	reader
ABC	XYZW18	XYZW18	XYZW18	writer
ABC	XYZW19	XYZW19	XYZW19	writer
ABC	XYZW20	XYZW20	XYZW20	writer
ABC	XYZW21	XYZW21	XYZW21	writer
ABC	XYZW22	XYZW22	XYZW22	writer

3.2.1 Hardware Specification for current Landscape

Host	Manufacturer	Computer Model	Operating System	CPU Type	CPU Frequency	No. of CPUs	Memory (TB)
XYZC01	HP		Linux RHEL 6.6	Intel Xeon (R)	2600	56	1.5
XYZW02	HP		Linux RHEL 6.6	Intel Xeon (R)	2600	56	1.5
XYZW09	HP		Linux RHEL 6.6	Intel Xeon (R)	2600	56	1.5
XYZC02	HP		Linux RHEL 6.6	Intel Xeon (R)	2600	56	1.5
XYZW10	HP		Linux RHEL 6.6	Intel Xeon (R)	2600	56	1.5
XYZW01	HP		Linux RHEL 6.6	Intel Xeon (R)	2600	56	1.5
XYZW11	HP		Linux RHEL 6.6	Intel Xeon (R)	2600	56	1.5
XYZW12	HP		Linux RHEL 6.6	Intel Xeon (R)	2600	56	1.5
XYZW13	HP		Linux RHEL 6.6	Intel Xeon (R)	2600	56	1.5
XYZW14	HP		Linux RHEL 6.6	Intel Xeon (R)	2600	56	1.5
XYZW03	HP		Linux RHEL 6.6	Intel Xeon (R)	2600	56	1.5
XYZW15	HP		Linux RHEL 6.6	Intel Xeon (R)	2600	56	1.5
XYZW06	HP		Linux RHEL 6.6	Intel Xeon (R)	2600	56	1.5
XYZW07	HP		Linux RHEL 6.6	Intel Xeon (R)	2600	56	1.5
XYZW08	HP		Linux RHEL 6.6	Intel Xeon (R)	2600	56	1.5
XYZW18	HP		Linux RHEL 6.6	Intel Xeon (R)	2600	56	1.5
XYZW19	HP		Linux RHEL 6.6	Intel Xeon (R)	2600	56	1.5
XYZW20	HP		Linux RHEL 6.6	Intel Xeon (R)	2600	56	1.5
XYZW21	HP		Linux RHEL 6.6	Intel Xeon (R)	2600	56	1.5
XYZW22	HP		Linux RHEL 6.6	Intel Xeon (R)	2600	56	1.5

4 Hardware Overview

4.1 DB Host CPU usage

OS CPU usage from all DB server nodes:

SQL> sa_cpu_topology stored procedure

os_id	socket	core	thread	apic	group	numa_node	online	in_use
0	0	0	0	0	0	0	1	1
1	0	1	0	2	0	0	1	1
2	0	2	0	4	0	0	1	1
3	0	3	0	6	0	0	1	1
4	0	4	0	8	0	0	1	1
5	0	5	0	10	0	0	1	1
6	0	6	0	12	0	0	1	1
7	0	7	0	16	0	0	1	1
8	0	8	0	18	0	0	1	1
9	0	9	0	20	0	0	1	1
10	0	10	0	22	0	0	1	1
11	0	11	0	24	0	0	1	1
12	0	12	0	26	0	0	1	1
13	0	13	0	28	0	0	1	1
14	1	0	0	32	0	1	1	1
15	1	1	0	34	0	1	1	1
16	1	2	0	36	0	1	1	1
17	1	3	0	38	0	1	1	1
18	1	4	0	40	0	1	1	1
19	1	5	0	42	0	1	1	1
20	1	6	0	44	0	1	1	1
21	1	7	0	48	0	1	1	1
22	1	8	0	50	0	1	1	1
23	1	9	0	52	0	1	1	1
24	1	10	0	54	0	1	1	1
25	1	11	0	56	0	1	1	1

4.2 DB Host Memory usage

OS memory usage from all DB server nodes

SQL> sp_iqhostutilization stored procedure (Linux only)

host	free_physical_memory	used_physical_memory	free_swap_space	used_swap_space	total_cpu_user_time	total_cpu_system_time	total_cpu_wio_time	total_cpu_idle_time
f	1466019733504	160241565696	549755031552	778240	10345458688	1361751552	342400480	4.61834E+11

4.3 DB Host space usage

Disk space usage from all DB server nodes

SQL> sa_disk_free_space stored procedure (Tested on Linux only)

dbspace_name	free_space	total_space
system	828,378,550,272	885,890,969,600
translog	828,378,550,272	885,890,969,600
temporary	98,888,376,320	105,555,197,952

SQL> sp_iqdisks (Tested on Linux only)

device_id	host	path	filesystem_type	usage_type	total_size	used_size
24P		/q1/i/L/IQ_ARCHIVE	q1	DATA	957,833,541,582,848	830,624,109,690,880
24P		/q1/i/L/IQ_MAIN	q1	DATA	957,833,541,582,848	830,624,109,690,880
24P		/q1/i/L/IQ_USER	q1	DATA	957,833,541,582,848	830,624,109,690,880
24P		/q1/i/L/IQ_MON_USER	q1	DATA	957,833,541,582,848	830,624,109,690,880
65,014		/Sybasedata	ext4	DATA	1,575,040,626,688	1,417,413,193,728

5 IQ Nodes Overview

5.1 Multiplex/Simplex server info

This section contains current information related to IQ Nodes running (SQL: "select substring(server_name,1,20) as server_name, substring(connection_info,1,30) as connection_info,mpx_mode, inc_state , status,substring(coordinator_failover,1,20) as coordinator_failover, substring(db_path,1,40) as db_path from sp_iqmpxinfo(),"):

Server_name	Connection_info	mpx_mode	Inc_state	status	coordinator_failover	db_path
XYZC01	host=XX.XX.XX.XX:2638	coordinator	N/A	included	XYZC02	/APP/ABC/CATALOG/DB/ABC.db
XYZW02	host=XX.XX.XX.XX:2638	writer	active	included	XYZC02	/APP/ABC/CATALOG/DB/ABC.db
XYZW09	host=XX.XX.XX.XX:2638	reader	active	included	XYZC02	/APP/ABC/CATALOG/DB/ABC.db
XYZC02	host=XX.XX.XX.XX:2638	writer	active	included	XYZC02	/APP/ABC/CATALOG/DB/ABC.db
XYZW10	host=XX.XX.XX.XX:2638	writer	active	included	XYZC02	/APP/ABC/CATALOG/DB/ABC.db
XYZW01	host=XX.XX.XX.XX:2638	writer	active	included	XYZC02	/APP/ABC/CATALOG/DB/ABC.db
XYZW11	host=XX.XX.XX.XX:2638	writer	active	included	XYZC02	/APP/ABC/CATALOG/DB/ABC.db
XYZW12	host=XX.XX.XX.XX:2638	writer	active	included	XYZC02	/APP/ABC/CATALOG/DB/ABC.db
XYZW13	host=XX.XX.XX.XX:2638	writer	active	included	XYZC02	/APP/ABC/CATALOG/DB/ABC.db
XYZW20	host=XX.XX.XX.XX:2638	writer	active	included	XYZC02	/APP/ABC/CATALOG/DB/ABC.db
XYZW21	host=XX.XX.XX.XX:2638	writer	active	included	XYZC02	/APP/ABC/CATALOG/DB/ABC.db
XYZW22	host=XX.XX.XX.XX:2638	writer	active	included	XYZC02	/APP/ABC/CATALOG/DB/ABC.db

Column Description

Column name	Description
server_name	Name of the server
connection_info	A formatted string containing the host/port portion of the connection string used for TCPIP connections between multiplex servers.
mpx_mode	'single' 'coordinator' 'writer' 'reader' 'writer' 'unknown'
Inc_state	'active' 'not responding' 'timed out'
status	'included' 'excluded'
coordinator_failover	Name of the failover server
db_path	Full database path

5.2 IQ DB version

SQL> select property('ServerName'), db_property('Name'),
property('ProductVersion'), db_property('File'),property('PlatformVer')

Output:

property(ServerName)	db_property(Name)	property(ProductVersion)	db_property(File)	property(PlatformVer)
		16.0.0.1364	/APP/1 /CATALOG/DB/ .db	Linux 2.6.32-504.30.3.el6.x86_64 #1 SMP Thu Jul 9 15:20:47 EDT 2015

select operation , version from syshistory where operation in ('INIT','UPGRADE');

select * from sp_iqstatus() where name like '%Version:%'

start_iq -v2

Select connection_property('AppInfo') ->

5.3 DB StartTime

This section shows IQ DB startup time Below Statement helps provide DB startup time(SQL: select @@servername as Hostname, CURRENT_TIMESTAMP AS TimeStamp, substring(VALUE,1,40) AS StartTime, SECONDS(VALUE, CURRENT_TIMESTAMP) AS RuntimeSeconds FROM SA_ENG_PROPERTIES() WHERE PropName = 'StartTime';)

<Need to run on each node>

HostName	Timestamp	StartTime	Runtime in seconds
XYZW04	8/25/2016 13:37	8/19/2016 16:17	508860
XYZW05	8/25/2016 13:37	8/11/2016 15:25	1203084

5.4 MPX Heartbeat info

SQL> sp_iqmpxvalidate or call dbo.sp_iqmpxvalidate('show_msgs')

Checks multiplex configuration for inconsistencies.

Executes multiple checks on tables `SYS.SYSIQDBFILE` and other multiplex events and stored procedures.

May run on any server. Returns a severity result to the caller; values are:

Output:

No error detected

è Check for error if reported

SQL> sp_iqmpxinheartbeatinfo

Output:

server_id	server_name	last_positive_hb	time_not_responding	time_until_timeout
1		07-10-2016	19:30:09	00:00:00

Column Description

Column name	Data type	Description	Values
server_id	unsigned int	Identifier for the server	
server_name	char(128)	Name of the server	
last_positive_hb	TIMESTAMP	Date/time of last successful heartbeat ping	DD:MM:YYYY:HH:MM:SS
time_not_responding	TIME	Time since last successful heartbeat ping	HH:MM:SS
time_until_timeout	TIME	If a node is not responding, the time left until node is declared offline.	

SQL> sp_iqmpxincstatistics

Output:

stat_name	stat_value
NumSuspendedINC	0
NumResumedINC	0
NumSuspendedTxnRollBackINC	0

Column Description

Value	Description
NumSuspendedINC	Number of suspended INC connections since server startup
NumResumedINC	Number of resumed INC connections since server startup
NumDroppedSuspendedINC	Number of dropped INC connections that have been suspended (on coordinator only)

Note: You can collect these data at regular intervals over a period time to have historical information.

5.5 Startup parameters

This section contains parameter in “.cfg” defined to start SAP IQ database (SQL: *select Value from sa_eng_properties() where PropName = 'CommandLine'*)

Output:

```
-----
-n XYZW04
-x tcpip(MyIP=10.141.66.51;port=2638)
-c 8192m
-gc 20
-gd dba
-gl all
-gm 100
-gn 150
-gp 32768
-igmc 512000
-iqlm 102400
-iqtc 512000
-iqmsgsz 2047
-iqmsgnum 30
-ti 60
-tl 600
-s none
-----
```

Parameter Description See [Appendix Section 8.1](#)

5.6 Cache Hits and Cache IO

This section Current IQ memory utilization in terms of Main cache pages usage and Temporary Cache usage. (SQL: *“select substring(stat_desc,1,50) Parameter, substring(stat_value,1,20) Value from sp_iqstatistics() where stat_name in ('TempCacheHits','MainCacheHits','TempCacheFinds','MainCacheFinds');”*)

Parameter	Value
Main cache total number of lookup requests	16070094
Main cache total number of hits	15904001
Temporary cache total number of lookup requests	147661995
Temporary cache total number of hits	146094482

This section Current IQ memory IO utilization in terms of Main cache IO and Temporary Cache IO(Graph Plotting).
SQL> *select CURRENT_TIMESTAMP AS TimeStamp, Value as MainIQ_IO_Statistics from sp_iqstatus() where Name = 'Main IQ I/O:'*

SQL> *select CURRENT_TIMESTAMP AS TimeStamp, Value as TeampIQ_IO_Statistics from sp_iqstatus() where Name = 'Temporary IQ I/O:'*

I : Input
L : Logical pages read (“Finds”)
P : Physical pages read
O : Output
C : Pages Created
D : Pages Dirtied
P : Physically Written
D : Pages Destroyed
C : Compression Ratio

5.7 Main Cache / Temp Cache / Catalog cache / Large Memory size

This section help to monitor at least large memory, main memory and temporary memory

```
SQL1) SELECT PROPERTY( 'CurrentCacheSize' )
```

Output:

Catalog cache size -> 8388608

```
SQL2)select * from sp_iqstatus() where Name like '%IQ large%'
```

Output:

Name	Value
IQ large memory space:	309600Mb
IQ large memory flexible percentage:	50
IQ large memory flexible used:	0Mb
IQ large memory inflexible percentage:	90
IQ large memory inflexible used:	106510Mb
IQ large memory anti-starvation percentage:	50

"Large Memory Space" – Maximum Large Memory configured size (-iqlm value from params.cfg)

"Large Memory Max Flexible" - Maximum memory granted for flexible operators. (e.g Load Engine(hash sort merge for hash/has-range partitioned table and hash sort merge cursor)).

"Large Memory Num Flex Allocations" – This is the count of memory chunks allocated as flex memory.

"Large Memory Flexible %" – percentage of large memory used for flexible operators.

"Large Memory Flexible used" – This is the total amount of memory allocated to flex users.

"Large Memory Inflexible %" – Percentage of large memory used for inflexible operators(N-bit metadata structures, data buffer of column vector in load).

"Large Memory Inflexible used" – Large memory used by inflexible operators

"Large Memory Anti-Starvation %" – This only applies to flexible operators.

```
SQ3> select @@servername, substring(stat_name,1,50) as stat_name,
substring(stat_value,1,20) stat_value from sp_iqstatistics() where stat_name in (
'MainCachePagesInUsePercentage', 'TempCachePagesInUsePercentage', 'MainCacheCurrentSize',
'MainCacheCurrentSize')
```

Output:

@@servername	stat_name	stat_value
	MainCacheCurrentSize	309600
	MainCachePagesInUsePercentage	98.69
	TempCacheCurrentSize	309600
	TempCachePagesInUsePercentage	0.72

5.8 Active connection and Threads in Use/Free

This section Current IQ connections active for different users (*SQL> select user_id, user_name, connections, last_login_time from sa_get_user_status() where connections>0*)

Output:

```
user_name, connections, last_login_time
-----
'monuser'      , 1 ,      '2016-09-01 20:18:00.000'
'sol dba'      , 4 ,      '2016-09-01 20:21:00.000'
```

This section Current IQ connections active and threads in use. (*SQL: "select substring(stat_desc,1,50) stat_desc, substring(stat_value,1,20) stat_value from sp_iqstatistics() where stat_name in ('ThreadsFree', 'ThreadsInUse', 'ConnectionsActive', 'OperationsActiveLoadTableStatements');"*)

Parameter	Value
Number of IQ threads free	1760
Number of IQ threads in use	1188
Number of active connections	7
Number of active LOAD TABLE statements	1

SQL> select @@max_connections

Output: 200 <<< Max connection allowed on the IQ node

Total IQ threads allocated at startup is based on

- Number of connections (-gm)
- Number of cores (-iqnumbercpus)

• By default, -iqmt is set to:

$60 * (\min(\text{numCores}, 4)) + 50 * (\text{numCores} - 4) + (\text{numConnections} + 2) + 6$

Two main types of IQ threads

- Connection Threads

- $2 * (\text{numConnections} + 2)$
- Reserved for connections

- Server Threads

- $60 * (\min(\text{numCores}, 4)) + 50 * (\text{numCores} - 4)$
- Support load and query operations
- Total threads can be set via -iqmt
- Make sure that -iqmt is larger than total threads needed for connections!
- Upper limit is currently 4096

5.9 Current DB Locks

This section Current IQ table locks held on that node (SQL: "select b.conn_id,substring(a.userid,1,15) as userid, substring(a.Name,1,40) as Name ,@@servername as Hostname, a.MPXServerName, a.connCreateTime,substring(b.table_name,1,20) as table_name,substring(a.ReqType,1,30) as ReqType, datediff(ss,a.LastReqTime, now()) as Last_CALL_ET_sec, b.lock_type b.lock_class from sp_iqconnection() a, sp_iqlocks() b where a.ConnHandle=b.conn_id;")

conn_id	userid	Name	Hostname	MPXServerName	connCreateTime	table_name	ReqType	Last_CALL_ET_sec	lock_type
116841	dbo	IQ_MPX_SERVER_P4236	XYZC01	XYZW11	8/22/2016 20:05	qwer	EXEC	48	Write
116841	dbo	IQ_MPX_SERVER_P4236	XYZC01	XYZW11	8/22/2016 20:05	dfw	EXEC	48	Shared
116844	dbo	IQ_MPX_SERVER_P5689	XYZC01	XYZW14	8/22/2016 20:06	rtk_slp_saa_qwer	PREFETCH	0	Write
116844	dbo	IQ_MPX_SERVER_P5689	XYZC01	XYZW14	8/22/2016 20:06	rtk_slp_sa_qwer	PREFETCH	0	Shared
116848	dbo	IQ_MPX_SERVER_P1549	XYZC01	XYZW20	8/22/2016 20:07	rCl_ADRC	PREFETCH	1	Write
116848	dbo	IQ_MPX_SERVER_P1549	XYZC01	XYZW20	8/22/2016 20:07	rCl_ADRC	PREFETCH	1	Shared
116849	dbo	IQ_MPX_SERVER_P6523	XYZC01	XYZW01	8/22/2016 20:07	ttasadlter_203	PREFETCH	18	Write
116849	dbo	IQ_MPX_SERVER_P6523	XYZC01	XYZW01	8/22/2016 20:07	ttasadlter_203	PREFETCH	18	Shared
116858	dbo	IQ_MPX_SERVER_P6524	XYZC01	XYZW01	8/22/2016 20:08	tasiameter_202	PREFETCH	18	Write
116858	dbo	IQ_MPX_SERVER_P6524	XYZC01	XYZW01	8/22/2016 20:08	as_202	PREFETCH	18	Shared
116859	dbo	IQ_MPX_SERVER_P6525	XYZC01	XYZW01	8/22/2016 20:09	sds_201	PREFETCH	18	Write
116859	dbo	IQ_MPX_SERVER_P6525	XYZC01	XYZW01	8/22/2016 20:09	tekDatadiameter_201	PREFETCH	18	Shared
116861	dbo	IQ_MPX_SERVER_P2387	XYZC01	XYZW10	8/22/2016 20:09	rtk_gtp_PM_qwer	PREFETCH	34	Write
116861	dbo	IQ_MPX_SERVER_P2387	XYZC01	XYZW10	8/22/2016 20:09	rtk_gtp_PM_qwer	PREFETCH	34	Shared
116876	dbo	IQ_MPX_SERVER_P1550	XYZC01	XYZW20	8/22/2016 20:11	FSSKKVKP	PREFETCH	0	Write
116876	dbo	IQ_MPX_SERVER_P1550	XYZC01	XYZW20	8/22/2016 20:11	FSSKKVKP	PREFETCH	0	Shared

Column Description

Column	Description
conn_id	Connection ID that has the lock.
user_id	User associated with this connection ID.
table_name	Table on which the lock is held.
lock_class	String of characters indicating the type of lock:
	S - share.
	SW - share and write.
	EW - exclusive and write.
	E - exclusive.
	P - phantom.
	A - antiphantom.
	W - write.
	All locks listed have one of S, E, EW, or SW, and may also have P, A, or both. Phantom and antiphantom locks also have a qualifier of T or *:
	T - the lock is with respect to a sequential scan.
	* - the lock is with respect to all scans.
	nnn - Index number; the lock is with respect to a particular index.
	Sybase IQ obtains a share lock before a write lock. If a connection has exclusive lock, share lock does not appear. For write locks, if a connection has all-exclusive, share, and write locks, it is EW.
lock_type	Value identifying the lock (dependent on the lock class)
ReqType	A string for the type of the last request.
MPXServerName	If an INC connection, the varchar(128) value contains the name of the multiplex server where the INC connection originates. NULL if not an INC connection.
Name	The name of the server.
Hostname	Local servername
ConnCreateTime	The time the connection was created.

New Options For IQ 16: Parameter LOG_DEADLOCKS

Description: When this option is set to On, the database server logs information about deadlocks in an internal buffer. The size of the buffer is fixed at 10000 bytes. You can view the deadlock information using the "sa_report_deadlocks" stored procedure. The contents of the buffer are retained when this option is set to Off. When deadlock occurs, information is reported for only those connections involved in the deadlock. The order in which connections are reported is based on which connection is waiting for which row. For thread deadlocks, information is reported about all connections.

When you have deadlock reporting turned on, you can also use the Deadlock system event to take action when a deadlock occurs.

Default: 'OFF'

5.10 IQ Temp space in Usage

This section Current IQ Version in use and space held on that node (SQL: *select month(now()),today(),cast(now() as time),substring(@@servername,1,20),substring(DBSpaceName,1,20),Usage from sp_iqdbspace() where DBSpaceName='IQ_SYSTEM_TEMP';*)

month(now())	today()	now()	substring(@@servername,1,20)	substring(sp_iqdbspace.DBSpaceName,1,20)	Usage
12	2016-12-13	12:30:30.892	XYZW04	IQ_SYSTEM_TEMP	1

5.11 Read IQMSG file

This section can help only top alert in iqmsg log files using grep option.

You can enhance script to find different error terms: [abort](#) | [err](#) | [exception](#) | [unexpected](#) | [out of space](#) | [warning](#) | [signal 11](#) | [stack](#) | [lock on](#) | [fatal](#)" in IQMSG file at OS created by IQ.

```
#!/bin/bash
```

```
FROMDATE=`date -s "today -1 days" +%m/%d`  
TODAY=`date +%m/%d`
```

```
grep "${FROMDATE}" "${TODAY}" *.iqmsg|grep -i "abort|err|exception|unexpected" > Err_iqmsg.log
```

5.12 IQ Versioning in Use

This section Current IQ Version in use and space held on that node (SQL> `select * from sp_iqstatus() where name like '%Versions:%'`)

Output:

```
Name                               Value
-----
Other Versions: 2 = 1968Mb
Active Txn Versions: 1 = C:2175Mb/D:2850Mb
```

The above example output shows that one active write transaction created 2175MB and destroyed 2850 MB of data. The total data consumed in transactions and not yet released is 4818MB, or 1968MB + 2850MB = 4818MB.

(SQL> "sp_iqversionuse")

Output:

VersionID	Server	IQConnID	WasRepo	MinKBRelease	MaxKBRelease
86902030	R...	0	1	332565664	332565664
86908277	R...	0	1	0	75462624
86909890	R...	0	1	0	82246176
86911042	R...	0	1	0	493760
86911092	R...	0	1	0	514208
86911734	R...	0	1	0	221248
86911787	R...	120923	1	0	361632
86911787	R...	0	1	0	361632

Column name	Description
VersionID	The version identifier
Server	The server to which users of this version are connected
IQConnID	The connection ID using this version
WasReported	Indicates whether the server has received usage information for this version
MinKBRelease	The minimum amount of space returned once this version is no longer in use
MaxKBRelease	The maximum amount of space returned once this version is no longer in use

SQL> select server, count(*) as TransactionCount from sp_iqversionuse() group by server

SQL> select server, Sum(MaxKBRelease/1024/1024) as SizeinGB from sp_iqversionuse() group by server

<Graph for Sizein GB v/s SAMPLE TIME> can give good monitoring for IQ versioning

This section help in finding top transaction/connection using high Version in use:

```
select top 5 Server, VersionID, MaxKBRelease from sp_iqversionuse() order by MaxKBRelease desc
select Server, count(1) from sp_iqversionuse() group by Server
select ISNULL(MPXServerName, 'dbo'), count(1) from sp_iqconnection() group by MPXServerName order by 2 desc
select a.UserID, a.connHandle, a.MainTableKBCr, b.CmdLine, b.ConnOrCurCreateTime from sp_iqtransaction()
a, sp_iqcontext() b where a.VersionID=127004135 AND a.ConnHandle=b.ConnHandle
```

```
SELECT a.ConnHandle, a.IQConnID, b.VersionID, a.IQthreads, a.ConncreateTime, b.TxnCreateTime,
a.LastReqTime, b."State", a."Name", a.UserID, b.txnid, a.RegType, a.NodeAddr, b.cmtid,
minutes(b.TxnCreateTime, now()) AS LOGON_SINCE_Minutes, minutes(a.LastReqTime, now()) AS
LAST_CALL_ET_MIN FROM sp_iqconnection() a, sp_iqtransaction() b WHERE b.State = 'ACTIVE' AND
a.IQConnID = b.IQConnID AND a."Name" NOT LIKE 'IQ_MPX_%'
```

5.13 TOP IQ Performance query

Number of Operation waiting:

```
SELECT (SELECT stat_value FROM SP_IQSTATISTICS('ConnectionsActive'))
AS ConnectionsActive, (SELECT stat_value FROM
SP_IQSTATISTICS('OperationsActive')) AS OperationsActive, (SELECT
stat_value FROM SP_IQSTATISTICS('OperationsWaiting')) AS
OperationsWaiting, (SELECT stat_value FROM
SP_IQSTATISTICS('OperationsActiveLoadTableStatements')) AS
OperationsActiveLoadTableStatements FROM DUMMY
```

Active Connection:

```
SELECT a.ConnHandle, a.IQConnID, a.Name, a. UserID, b.txnid,
b.TxnCreateTime, minutes(b.TxnCreateTime, now()) AS DurationMinutes
FROM sp_iqconnection() a, sp_iqtransaction() b WHERE b.State =
'ACTIVE' AND a.IQConnID = b.IQConnID AND a.Name NOT LIKE 'IQ_MPX_%'
```

```
SELECT a.ConnHandle, a.IQConnID, a.IQthreads, a.ConncreateTime,
b.TxnCreateTime, a.LastReqTime, a."Name", a. UserID,
b.txnid,a.RegType,a.NodeAddr, b.cmtid, minutes(b.TxnCreateTime,
now()) AS LOGON_SINCE_Minutes,minutes(a.LastReqTime, now()) AS
LAST_CALL_ET_MIN FROM sp_iqconnection() a, sp_iqtransaction() b
WHERE b.State = 'ACTIVE' AND a.IQConnID = b.IQConnID AND a."Name"
NOT LIKE 'IQ_MPX_%'
```

Long running active transaction:

```
select a.ConnHandle,a.IQConnID,a.IQThreads,a.TxnID,c."server" as
VersionUse_Server,b.CmtID, b.VersionID,datediff(ss,a.LastReqTime,
now()) as Last_CALL_ET, c.MaxKBRelease as
Version_MaxKBRelease,a."Name",a.UserID,a.ConnCreatetime,b.TxnCreateT
ime,a.LastReqTime,a.RegType,a.NodeAddr, d.CmdLine from
sp_iqconnection() a, sp_iqtransaction() b, sp_iqversionuse() c ,
sp_iqcontext() d where b.VersionID=c.VersionID and
a.TempWorkSpaceKB=b.TempWorkSpaceKB and d.connHandle=a.connHandle
and d.connHandle=b.connHandle and b.CmtID=0 and last_call_ET>0
```

```
SELECT a.ConnHandle, a.IQConnID,b.VersionID, a.IQthreads, a.ConncreateTime, b.TxnCreateTime,
a.LastReqTime, b."State", a."Name", a. UserID, b.txnid,a.RegType,a.NodeAddr, b.cmtid,
minutes(b.TxnCreateTime, now()) AS LOGON_SINCE_Minutes,minutes(a.LastReqTime, now()) AS
LAST_CALL_ET_MIN FROM sp_iqconnection() a, sp_iqtransaction() b WHERE b.State = 'ACTIVE' AND
a.IQConnID = b.IQConnID AND a."Name" NOT LIKE 'IQ_MPX_%' and LAST_CALL_ET_MIN > 0 and
LOGON_SINCE_Minutes > 60
```


6 General DB Status Overview

This section contains current information related to IQ DB Nodes and running startup parameters.

6.1 IQ DB Status

This section contains general information related to the Oracle database (SQL: "select substring(Name,1,50) as Name, Value from sp_iqstatus()").

Name	Value
SAP IQ (TM)	Copyright (c) 1992-2016 by SAP AG or an SAP affiliate company. All rights reserved.
Version:	16.0.102.6.1364/20135/P/sp10.12/Enterprise Linux64 - x86_64 - 2.6.18-194.el5/64bit/2016-03-31 02:36:25
Time Now:	09:28.4
Build Time:	3/31/2016 2:36
File Format:	23 on 03/18/1999
Server mode:	IQ Multiplex Coordinator Server
Catalog Format:	2
Stored Procedure Revision:	1
Page Size:	524288/32768blks/16bpp
Number of Main DB Files:	101
Main Store Out Of Space:	N
Number of Cache Dbspace Files:	0
Number of Shared Temp DB Files:	0
Shared Temp Store Out Of Space:	N
Number of Local Temp DB Files:	3
Local Temp Store Out Of Space:	N
DB Blocks: 16739328-150957055	user01
DB Blocks: 154838784-289056511	user02
DB Blocks: 292938240-427155967	user03
DB Blocks: 431037696-565255423	user04
DB Blocks: 569137152-703354879	user05
DB Blocks: 707236608-841454335	user06
DB Blocks: 845336064-979553791	user07
DB Blocks: 983435520-1117653247	user08
DB Blocks: 1121534976-1255752703	user09
DB Blocks: 1259634432-1393852159	user10
DB Blocks: 1397733888-1531951615	user11
DB Blocks: 1535833344-1670051071	user12
DB Blocks: 1673932800-1808150527	user13
DB Blocks: 1812032256-1946249983	user14
DB Blocks: 1950131712-2084349439	user15
DB Blocks: 2088231168-2222448895	user16
DB Blocks: 2226330624-2360548351	user17
DB Blocks: 2364430080-2498647807	user18
DB Blocks: 2502529536-2636747263	user19
DB Blocks: 2640628992-2774846719	user20
DB Blocks: 2778728448-2912946175	user21
DB Blocks: 2916827904-3051045631	user22
DB Blocks: 3054927360-3189145087	user23

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DB Blocks: 3193026816-3327244543	user24
DB Blocks: 3331126272-3465343999	user25
DB Blocks: 3469225728-3603443455	user26
DB Blocks: 3607325184-3741542911	user27
DB Blocks: 3745424640-3879642367	user28
DB Blocks: 3883524096-4017741823	user29
DB Blocks: 4021623552-4155841279	user30
DB Blocks: 4159723008-4293940735	user31
DB Blocks: 4297822464-4432040191	user32
DB Blocks: 4435921920-4570139647	user33
DB Blocks: 4574021376-4708239103	user34
DB Blocks: 4712120832-4846338559	user35
DB Blocks: 4850220288-4984438015	user36
DB Blocks: 4988319744-5122537471	user37
DB Blocks: 5126419200-5260636927	user38
DB Blocks: 5264518656-5398736383	user39
DB Blocks: 5402618112-5536835839	user40
DB Blocks: 5540717568-5674935295	user41
DB Blocks: 5678817024-5813034751	user42
DB Blocks: 5816916480-5951134207	user43
DB Blocks: 5955015936-6089233663	user44
DB Blocks: 6093115392-6227333119	user45
DB Blocks: 6231214848-6365432575	user46
DB Blocks: 6369314304-6503532031	user47
DB Blocks: 6507413760-6641631487	user48
DB Blocks: 6645513216-6779730943	user49
DB Blocks: 6783612672-6917830399	user50
DB Blocks: 6921712128-7055929855	user51
DB Blocks: 7059811584-7194029311	user52
DB Blocks: 7197911040-7332128767	user53
DB Blocks: 7336010496-7470228223	user54
DB Blocks: 7474109952-7608327679	user55
DB Blocks: 7612209408-7746427135	user56
DB Blocks: 7750308864-7884526591	user57
DB Blocks: 7888408320-8022626047	user58
DB Blocks: 8026507776-8160725503	user59
DB Blocks: 8164607232-8298824959	user60
DB Blocks: 8302706688-8436924415	user61
DB Blocks: 8440806144-8575023871	user62
DB Blocks: 8578905600-8713123327	user63
DB Blocks: 8717005056-8851222783	user64
DB Blocks: 8855104512-8989322239	user65
DB Blocks: 8993203968-9127421695	user66
DB Blocks: 9131303424-9265521151	user67
DB Blocks: 9269402880-9403620607	user68
DB Blocks: 9407502336-9541720063	user69
DB Blocks: 9545601792-9679819519	user70
DB Blocks: 9683701248-9817918975	user71
DB Blocks: 9821800704-9956018431	user72
DB Blocks: 9959900160-10094117887	user73
DB Blocks: 10097999616-10232217343	user74

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DB Blocks: 10236099072-10370316799	user75
DB Blocks: 10374198528-10508416255	user76
DB Blocks: 10512297984-10646515711	user77
DB Blocks: 10650397440-10784615167	user78
DB Blocks: 10788496896-10922714623	user79
DB Blocks: 10926596352-11060814079	user80
DB Blocks: 11064695808-11198913535	user81
DB Blocks: 11202795264-11337012991	user82
DB Blocks: 11340894720-11475112447	user83
DB Blocks: 11478994176-11613211903	user84
DB Blocks: 11617093632-11751311359	user85
DB Blocks: 11755193088-11889410815	user86
DB Blocks: 11893292544-12027510271	user87
DB Blocks: 12031392000-12165609727	user88
DB Blocks: 12169491456-12303709183	user89
DB Blocks: 12307590912-12441808639	user90
DB Blocks: 12445690368-12579908095	user91
DB Blocks: 12583789824-12718007551	user92
DB Blocks: 12721889280-12856107007	user93
DB Blocks: 12859988736-12994206463	user94
DB Blocks: 12998088192-13132305919	user95
DB Blocks: 13136187648-13270405375	user96
DB Blocks: 13274287104-13408504831	user97
DB Blocks: 13412386560-13546604287	user98
DB Blocks: 13550486016-13684703743	user99
DB Blocks: 13826684928-13910571007	IQ_SYSTEM_MAIN1
DB Blocks: 13914566400-13998452479	IQ_SYSTEM_MAIN2
Local Temp Blocks: 1-15073280	IQ_SYSTEM_TEMP
Local Temp Blocks: 16739328-31812607	IQ_SYSTEM_TEMP02
Local Temp Blocks: 33478656-46585855	IQ_SYSTEM_TEMP03
Create Time:	49:31.5
Update Time:	08:38.2
Main IQ Buffers:	618586, 309600Mb
Temporary IQ Buffers:	618586, 309600Mb
Main IQ Blocks Used:	5167389253 of 13454488372, 38%=157696Gb, Max Block#: 13954552110
Cache Dbspace IQ Blocks Used:	0 of 0, 0%=0Mb, Max Block#: 0
Shared Temporary IQ Blocks Used:	0 of 0, 0%=0Mb, Max Block#: 0
Local Temporary IQ Blocks Used:	547 of 43122688, 0%=17Mb, Max Block#: 34263440
Main Reserved Blocks Available:	838860 of 838860, 100%=26214Mb
Shared Temporary Reserved Blocks Available:	0 of 0, 0%=0Mb
Local Temporary Reserved Blocks Available:	131072 of 131072, 100%=4096Mb
IQ Dynamic Memory:	Current: 628706mb, Max: 631224mb
Main IQ Buffers:	Used: 618584, Locked: 1
Temporary IQ Buffers:	Used: 1065, Locked: 0
Main IQ I/O:	I: L980781954/P3720721 O: C51045989/D65065490/P28855004 D:78608233 C:72.3

General DB Status Overview

Temporary IQ I/O:	I: L3057650754/P10 O: C53781765/D54755320/P2342220 D:53780705 C:45.3
Other Versions:	2357 = 2816Gb
Active Txn Versions:	0 = C:0Mb/D:0Mb
Last Full Backup ID:	78249976
Last Full Backup Time:	8/7/2016 18:22
Last Backup ID:	78249976
Last Backup Type:	FULL
Last Backup Time:	8/7/2016 18:22
DB Updated:	1
Blocks in next ISF Backup:	1816552047 Blocks: =55436Gb
Blocks in next ISI Backup:	1816552047 Blocks: =55436Gb
Main Tlvlog Size:	Pages: 42, Recs: 44827, Replays: 0/0
IQ large memory space:	309600Mb
IQ large memory flexible percentage:	50
IQ large memory flexible used:	0Mb
IQ large memory inflexible percentage:	90
IQ large memory inflexible used:	106510Mb
IQ large memory anti-starvation percentage:	50
DB File Encryption Status:	OFF
RLV Status:	RO
RLV memory limit (mb):	2048
RLV memory used (bytes):	0
RLV Log Buffers Allocated:	0
RLV Log Buffers Globally Free:	0
RLV Log Buffers Privately Free:	0
RLV Log Buffers In Use:	0

The following is a key to understanding the Main IQ I/O and Temporary IQ I/O output codes:

I: Input
 L: Logical pages read ("Finds")
 P: Physical pages read
 O: Output
 C: Pages Created
 D: Pages Dirtied
 P: Physically Written
 D: Pages Destroyed
 C: Compression Ratio

Check the following information:

- The lines Main IQ Blocks Used and Temporary IQ Blocks used tell you what portion of your dbspace is in use. If the percentage of blocks in use (the middle statistic on these lines) is in the high nineties, you need to add a dbspace.
- The lines Main IQ Buffers and Temporary IQ Buffers tell you the current sizes of your main and temp buffer caches.
- Other Versions shows other db versions and the total space consumed. These versions will eventually be dropped when they are no longer referenced or referenceable by active transactions.
- Active Txn Versions shows the number of active write transactions and the amount of data they have created and destroyed. If these transactions commit, the "destroyed" data will become an old version and eventually be dropped. If they rollback, the "created" data will be freed.
- Main Reserved Blocks Available and Temporary Reserved Blocks Available show the amount of reserved space that is available.
- The lines Main IQ I/O and Temporary IQ I/O display I/O status in the same format as in the IQ message log.

6.2 Space Information

6.2.1 DBspace Info

This section provides information for all tablespaces (SQL: "select substring(DBSpaceName,1,20) as DBSpaceName, DBSpaceType, Usage, TotalSize, Reserve, NumFiles, Online, Writable from sp_iqdbspace()").

DBSpaceName	DBSpaceType	PercUsed	TotalSize	Reserve	NumFiles	Online	Writable
IQ_SYSTEM_MAIN	MAIN	36	5T	0B	2	T	T
IQ_SYSTEM_TEMP	TEMPORARY	1	1.28T	0B	3	T	T
ABC_user	MAIN	39	396T	0B	99	T	T

Column Description

Column name	Description
DBSpaceName	Name of the dbspace as specified in the CREATE DBSPACE statement. Dbspace names are case-insensitive for databases created with CASE RESPECT.
DBSpaceType	Type of the dbspace (MAIN or TEMPORARY only).
Writable	T (writable) or F (not writable).
Online	T (online) or F (offline).
PercUsed	Percent of dbspace currently in use by all files in the dbspace.
TotalSize	Total size of all files in the dbspace in the units B (bytes), K (kilobytes), M (megabytes), G (gigabytes), T (terabytes), or P (petabytes).
Reserve	Total reserved space that can be added to all files in the dbspace.
NumFiles	Number of files in the dbspace.

Monitoring Free Space Using The New "sa_disk_free_space" Stored Procedure

- New system procedure for monitoring the free space for system DBspaces called "sa_disk_free_space".

This procedure returns the system DBspace name, the free disk size and the total disk size.

- The system DBspace names that can be used with the sa_disk_free_space syntax are:
 - SYSTEM
 - TRANSLOG
 - TRANSLOGMIRROR
 - TEMPORARY or TEMP

Tip: Monitor Your Free Space

- Be sure to monitor your IQ DBspaces frequently by running the "sa_disk_free_space" procedure at regular intervals throughout the day.
- Run it either manually, by scheduling its execution in a CREATE EVENT statement, or in an UNIX script to monitor free space.

For example:

call sa_disk_free_space (system);

--> returns disk info for the system DBspace (.DB)

call sa_disk_free_space (translog);

--> returns disk info for the transaction log (.LOG).

call sa_disk_free_space (temp);

--> returns disk info for the disk where temporary files reside.

6.2.2 DBFile Info

This section provides information for all dbfiles from actual DBspaces (SQLselect substring(DBSpaceName,1,15) as DBSpaceName, substring(Path,1,50) as Path , SegmentType, RWMode, Online , Usage, DBFileSize from sp_iqfile('IQ_SYSTEM_MAIN'))

Output:

DBSpaceName	Path	Segment Type	RWMode	Online	Usage	DBFileSize
IQ_SYSTEM_MAIN	/qwer/abc_qwer/IQ_MAIN/IQ_SYSTEM_MAIN1.iq	MAIN	RW	T	32	2.5T
IQ_SYSTEM_MAIN	/qwer/abc_qwer/IQ_MAIN/IQ_SYSTEM_MAIN2.iq	MAIN	RW	T	33	2.5T
ABC_user	/qwer/abc_qwer/IQ_USER/user01	MAIN	RW	T	45	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user02	MAIN	RW	T	45	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user03	MAIN	RW	T	45	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user04	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user05	MAIN	RW	T	43	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user06	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user07	MAIN	RW	T	43	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user08	MAIN	RW	T	43	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user09	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user10	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user11	MAIN	RW	T	43	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user12	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user13	MAIN	RW	T	43	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user14	MAIN	RW	T	43	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user15	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user16	MAIN	RW	T	43	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user17	MAIN	RW	T	43	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user18	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user19	MAIN	RW	T	43	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user20	MAIN	RW	T	43	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user21	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user22	MAIN	RW	T	45	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user23	MAIN	RW	T	46	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user24	MAIN	RW	T	47	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user25	MAIN	RW	T	45	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user26	MAIN	RW	T	45	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user27	MAIN	RW	T	45	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user28	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user29	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user30	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user31	MAIN	RW	T	45	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user32	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user33	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user34	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user35	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user36	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user37	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user38	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user39	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user40	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user41	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user42	MAIN	RW	T	45	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user43	MAIN	RW	T	45	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user44	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user45	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user46	MAIN	RW	T	43	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user47	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user48	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user49	MAIN	RW	T	45	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user50	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user51	MAIN	RW	T	45	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user52	MAIN	RW	T	45	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user53	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user54	MAIN	RW	T	43	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user55	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user56	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user57	MAIN	RW	T	43	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user58	MAIN	RW	T	43	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user59	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user60	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user61	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user62	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user63	MAIN	RW	T	45	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user64	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user65	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user66	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user67	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user68	MAIN	RW	T	44	4T

ABC_user	/qwer/abc_qwer/IQ_USER/user69	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user70	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user71	MAIN	RW	T	43	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user72	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user73	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user74	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user75	MAIN	RW	T	44	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user76	MAIN	RO	T	24	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user77	MAIN	RO	T	24	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user78	MAIN	RO	T	23	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user79	MAIN	RO	T	24	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user80	MAIN	RO	T	23	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user81	MAIN	RO	T	23	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user82	MAIN	RO	T	24	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user83	MAIN	RO	T	24	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user84	MAIN	RO	T	23	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user85	MAIN	RO	T	23	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user86	MAIN	RO	T	23	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user87	MAIN	RO	T	23	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user88	MAIN	RO	T	23	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user89	MAIN	RO	T	23	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user90	MAIN	RO	T	24	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user91	MAIN	RO	T	23	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user92	MAIN	RO	T	23	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user93	MAIN	RO	T	23	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user94	MAIN	RO	T	23	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user95	MAIN	RO	T	24	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user96	MAIN	RO	T	24	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user97	MAIN	RO	T	24	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user98	MAIN	RO	T	24	4T
ABC_user	/qwer/abc_qwer/IQ_USER/user99	MAIN	RO	T	21	4T
IQ_SYSTEM_TEMP	/Sybasedata/IQ_SYSTEM_TEMP01.iqtmp	TEMPORARY	RW	T	1	460GB
IQ_SYSTEM_TEMP	/Sybasedata/IQ_SYSTEM_TEMP02	TEMPORARY	RW	T	1	460GB
IQ_SYSTEM_TEMP	/Sybasedata/IQ_SYSTEM_TEMP03	TEMPORARY	RW	T	1	460GB

Column Description

Column name	Description
DBSpaceName	Name of the dbspace as specified in the CREATE DBSPACE statement. Dbspace names are case-insensitive for databases created with CASE RESPECT.
DBFileName	Logical file name.
Path	Location of the physical file or raw partition.
SegmentType	Type of dbspace (MAIN or TEMPORARY).
RWMode	Mode of the dbspace: read-write (RW) or read-only (RO).
Online	T (online) or F (offline).
Usage	Percent of dbspace currently in use by this file in the dbspace.
DBFileSize	Current size of the file or raw partition. For a raw partition, this size value can be less than the physical size.
Reserve	Reserved space that can be added to this file in the dbspace.

6.2.3 IQ Catalog DB and IQMSG file Info

This section provides information for IQ files not allocated within DBspace of database IQ (SQL: "select file_id, file_name, dbspace_name, store_type from sysfile where dbspace_name not in ('IQ_SYSTEM_MAIN', 'IQ_SYSTEM_TEMP', 'ABC_user')")

file_id	file_name	dbspace_name	store_type
0	/APP/I 1/CATALOG/DB/IQ*.db	system	1
15	/tmp/.SQLAnywhere/prdiq_1c_1/tmp/tmp_000000	temporary	1
32702	IQ_SYSTEM_LOG	IQ_SYSTEM_LOG	2
16488	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000000.iqmsg	IQ_SYSTEM_MSG	2
16489	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000001.iqmsg	IQ_SYSTEM_MSG	2
16490	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000002.iqmsg	IQ_SYSTEM_MSG	2
16491	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000003.iqmsg	IQ_SYSTEM_MSG	2
16492	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000004.iqmsg	IQ_SYSTEM_MSG	2
16493	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000005.iqmsg	IQ_SYSTEM_MSG	2
16494	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000006.iqmsg	IQ_SYSTEM_MSG	2
16495	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000007.iqmsg	IQ_SYSTEM_MSG	2
16496	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000008.iqmsg	IQ_SYSTEM_MSG	2
16497	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000009.iqmsg	IQ_SYSTEM_MSG	2
16500	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000010.iqmsg	IQ_SYSTEM_MSG	2
16501	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000011.iqmsg	IQ_SYSTEM_MSG	2
16502	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000012.iqmsg	IQ_SYSTEM_MSG	2
16503	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000013.iqmsg	IQ_SYSTEM_MSG	2
16504	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000014.iqmsg	IQ_SYSTEM_MSG	2
16505	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000015.iqmsg	IQ_SYSTEM_MSG	2
16506	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000016.iqmsg	IQ_SYSTEM_MSG	2
16507	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000017.iqmsg	IQ_SYSTEM_MSG	2
16508	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000018.iqmsg	IQ_SYSTEM_MSG	2
16509	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000019.iqmsg	IQ_SYSTEM_MSG	2
16510	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000020.iqmsg	IQ_SYSTEM_MSG	2
16511	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000021.iqmsg	IQ_SYSTEM_MSG	2
16512	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000022.iqmsg	IQ_SYSTEM_MSG	2
16513	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000023.iqmsg	IQ_SYSTEM_MSG	2
16514	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000024.iqmsg	IQ_SYSTEM_MSG	2
16515	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000025.iqmsg	IQ_SYSTEM_MSG	2
16516	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000026.iqmsg	IQ_SYSTEM_MSG	2
16517	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000027.iqmsg	IQ_SYSTEM_MSG	2
16518	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000028.iqmsg	IQ_SYSTEM_MSG	2
16519	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000029.iqmsg	IQ_SYSTEM_MSG	2
16520	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000030.iqmsg	IQ_SYSTEM_MSG	2
16521	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000031.iqmsg	IQ_SYSTEM_MSG	2
16522	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000032.iqmsg	IQ_SYSTEM_MSG	2
16523	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000033.iqmsg	IQ_SYSTEM_MSG	2
16524	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000034.iqmsg	IQ_SYSTEM_MSG	2
16525	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000035.iqmsg	IQ_SYSTEM_MSG	2
16526	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000036.iqmsg	IQ_SYSTEM_MSG	2
16527	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000037.iqmsg	IQ_SYSTEM_MSG	2
16528	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000038.iqmsg	IQ_SYSTEM_MSG	2
16529	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000039.iqmsg	IQ_SYSTEM_MSG	2
16530	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000040.iqmsg	IQ_SYSTEM_MSG	2
16531	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000041.iqmsg	IQ_SYSTEM_MSG	2
16532	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000042.iqmsg	IQ_SYSTEM_MSG	2
16533	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000043.iqmsg	IQ_SYSTEM_MSG	2
16534	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000044.iqmsg	IQ_SYSTEM_MSG	2
16535	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000045.iqmsg	IQ_SYSTEM_MSG	2
16536	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000046.iqmsg	IQ_SYSTEM_MSG	2
16537	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000047.iqmsg	IQ_SYSTEM_MSG	2
16538	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000048.iqmsg	IQ_SYSTEM_MSG	2
16539	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000049.iqmsg	IQ_SYSTEM_MSG	2
16540	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000050.iqmsg	IQ_SYSTEM_MSG	2
16541	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000051.iqmsg	IQ_SYSTEM_MSG	2
16542	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000052.iqmsg	IQ_SYSTEM_MSG	2
16543	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000053.iqmsg	IQ_SYSTEM_MSG	2
16544	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000054.iqmsg	IQ_SYSTEM_MSG	2
16545	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000055.iqmsg	IQ_SYSTEM_MSG	2
16546	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000056.iqmsg	IQ_SYSTEM_MSG	2
16547	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000057.iqmsg	IQ_SYSTEM_MSG	2
16548	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000058.iqmsg	IQ_SYSTEM_MSG	2
16549	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000059.iqmsg	IQ_SYSTEM_MSG	2
16550	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000060.iqmsg	IQ_SYSTEM_MSG	2
16551	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000061.iqmsg	IQ_SYSTEM_MSG	2
16552	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000062.iqmsg	IQ_SYSTEM_MSG	2
16553	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000063.iqmsg	IQ_SYSTEM_MSG	2
16554	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000064.iqmsg	IQ_SYSTEM_MSG	2
16555	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000065.iqmsg	IQ_SYSTEM_MSG	2
16556	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000066.iqmsg	IQ_SYSTEM_MSG	2
16557	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000067.iqmsg	IQ_SYSTEM_MSG	2
16558	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000068.iqmsg	IQ_SYSTEM_MSG	2
16559	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000069.iqmsg	IQ_SYSTEM_MSG	2
16560	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000070.iqmsg	IQ_SYSTEM_MSG	2
16561	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000071.iqmsg	IQ_SYSTEM_MSG	2
16562	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000072.iqmsg	IQ_SYSTEM_MSG	2
16563	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000073.iqmsg	IQ_SYSTEM_MSG	2
16564	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000074.iqmsg	IQ_SYSTEM_MSG	2
16565	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000075.iqmsg	IQ_SYSTEM_MSG	2
16566	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000076.iqmsg	IQ_SYSTEM_MSG	2
16567	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000077.iqmsg	IQ_SYSTEM_MSG	2
16568	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000078.iqmsg	IQ_SYSTEM_MSG	2
16569	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000079.iqmsg	IQ_SYSTEM_MSG	2
16570	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000080.iqmsg	IQ_SYSTEM_MSG	2
16571	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000081.iqmsg	IQ_SYSTEM_MSG	2
16572	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000082.iqmsg	IQ_SYSTEM_MSG	2
16573	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000083.iqmsg	IQ_SYSTEM_MSG	2
16574	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000084.iqmsg	IQ_SYSTEM_MSG	2
16575	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000085.iqmsg	IQ_SYSTEM_MSG	2
16576	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000086.iqmsg	IQ_SYSTEM_MSG	2
16577	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000087.iqmsg	IQ_SYSTEM_MSG	2
16578	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000088.iqmsg	IQ_SYSTEM_MSG	2
16579	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000089.iqmsg	IQ_SYSTEM_MSG	2
16580	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000090.iqmsg	IQ_SYSTEM_MSG	2
16581	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000091.iqmsg	IQ_SYSTEM_MSG	2
16582	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000092.iqmsg	IQ_SYSTEM_MSG	2
16583	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000093.iqmsg	IQ_SYSTEM_MSG	2
16584	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000094.iqmsg	IQ_SYSTEM_MSG	2
16585	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000095.iqmsg	IQ_SYSTEM_MSG	2
16586	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000096.iqmsg	IQ_SYSTEM_MSG	2
16587	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000097.iqmsg	IQ_SYSTEM_MSG	2
16588	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000098.iqmsg	IQ_SYSTEM_MSG	2
16589	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000099.iqmsg	IQ_SYSTEM_MSG	2
16590	/APP/I 1/LOGS/IQMSGSG/PRDIQ1W000100.iqmsg	IQ_SYSTEM_MSG	2

IQ SERVER LOG FILE

On UNIX and Linux servers, the server log files are located in \$IQDIR16/logfiles. These server log files have 4 digit numbers.

- Startup information is saved in the <servername>.000n.stderr file
- Server status is logged in the <servername>.000n.srvlog file

To find the srvlog full path:

SQL> select property('ConsoleLogFile') as srvlogfile;

/APP/I 1/LOGS/IQSRVLOGS/	1.0055.srvlog
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Additionally Note: The SYSDBFILE system view shows all the dbfiles in your database, including the catalog, message file, and dbfiles in the main and temporary dbspaces. To return dbfile and dbspace statistics, query the SYSDBFILE system view:

SQL SELECT dbf.dbfile_name, f.* FROM SYSFILE f, SYSDBFILE dbf WHERE f.file_id=dbf.dbfile_id

The file_name column in the SYSFILE system table for the SYSTEM dbspace is not updated during a restore. For the SYSTEM dbspace, the file_name column always reflects the name when the database was created. The file name of the SYSTEM dbspace is the name of the database file.

IQ REQUEST LOG FILE

There are two ways to enable request-level logging:

- Setting -zr command-line option when starting the IQ server
 - Requires a reboot of the server
- Calling "sa_server_option" stored procedure
 - Overrides the current setting of -z

On UNIX and Linux servers, the server log files are located in \$IQDIR16/logfiles

SQL> select property('RequestLogFile'), property('RequestLogging');

6.2.4 Largest Tables in IQ

This section lists the tables with the largest size (SQL: “select owner,object_name, convert (float,substr (columns,1, char_length (columns)-1))*power (1024,charindex(substr(columns,char_length(columns),1), 'BKMGT')-1) as bytes from sp_iqdbspaceinfo() order by 3 desc;”)

OR

This section lists the tables with the largest size (including indexes segments; SQL: “./IQHC_DB_TABLESIZE.sh”)

Cur_date	OwnerName	TableName	SizeGB	DbSpaceName	isPartitioned	Table_type	isRiv	location	indexes	columns
8/19/2016	LALALA	OOLALALA	202	ABC_user	N	BASE	F	Main	0/0	38/38
8/19/2016	LALALA	OOLALALA	24	ABC_user	N	BASE	F	Main	0/0	99/99
8/19/2016	LALALA	OOLALALA	19	ABC_user	N	BASE	F	Main	0/0	315/315
8/19/2016	LALALA	OOLALALA	17	ABC_user	N	BASE	F	Main	10/10	40/40
8/19/2016	LALALA	OOLALALA	13	ABC_user	N	BASE	F	Main	0/0	148/148
8/19/2016	LALALA	OOLALALA	13	ABC_user	N	BASE	F	Main	0/0	238/238
8/19/2016	LALALA	OOLALALA	12	ABC_user	N	BASE	F	Main	0/0	99/99
8/19/2016	LALALA	OOLALALA	10	ABC_user	N	BASE	F	Main	15/15	99/99
8/19/2016	LALALA	OOLALALA	8	ABC_user	N	BASE	F	Main	0/0	148/148
8/19/2016	LALALA	OOLALALA	7	ingest	N	BASE	F	Main	15/15	99/99
8/19/2016	LALALA	OOLALALA	6	ABC_user	N	BASE	F	Main	0/0	148/148
8/19/2016	LALALA	OOLALALA	5	ABC_user	N	BASE	F	Main	0/0	148/148
8/19/2016	LALALA	OOLALALA	5	ABC_user	N	BASE	F	Main	0/0	10-Oct
8/19/2016	LALALA	OOLALALA	5	ABC_user	N	BASE	F	Main	0/0	99/99
8/19/2016	LALALA	OOLALALA	4	ABC_user	N	BASE	F	Main	0/0	148/148
8/19/2016	LALALA	OOLALALA	4	ABC_user	N	BASE	F	Main	0/0	148/148
8/19/2016	LALALA	OOLALALA	4	ABC_user	N	BASE	F	Main	0/0	320/320
8/19/2016	LALALA	OOLALALA	4	ABC_user	N	BASE	F	Main	15/15	99/99
8/19/2016	LALALA	OOLALALA	3	ABC_user	N	BASE	F	Main	0/0	41/41
8/19/2016	LALALA	OOLALALA	3	ABC_user	N	BASE	F	Main	19/19	19/19
8/19/2016	LALALA	OOLALALA	3	ABC_user	N	BASE	F	Main	21/21	152/152
8/19/2016	LALALA	OOLALALA	3	ABC_user	N	BASE	F	Main	0/0	148/148
8/19/2016	LALALA	OOLALALA	2	ABC_user	N	BASE	F	Main	0/0	38/38
8/19/2016	LALALA	OOLALALA	2	ABC_user	N	BASE	F	Main	0/0	148/148
8/19/2016	LALALA	OOLALALA	2	ABC_user	N	BASE	F	Main	21/21	152/152
8/19/2016	LALALA	OOLALALA	2	ABC_user	N	BASE	F	Main	0/0	180/180
8/19/2016	LALALA	OOLALALA	2	ABC_user	N	BASE	F	Main	0/0	107/107
8/19/2016	LALALA	OOLALALA	2	ABC_user	N	BASE	F	Main	15/15	100/100
8/19/2016	LALALA	OOLALALA	2	ABC_user	N	BASE	F	Main	15/15	100/100
8/19/2016	LALALA	OOLALALA	2	ABC_user	N	BASE	F	Main	15/15	100/100
8/19/2016	LALALA	OOLALALA	2	ABC_user	N	BASE	F	Main	0/0	99/99
8/19/2016	LALALA	OOLALALA	1	ABC_user	N	BASE	F	Main	0/0	92/92
8/19/2016	LALALA	OOLALALA	1	ABC_user	N	BASE	F	Main	0/0	51/51
8/19/2016	LALALA	OOLALALA	1	ABC_user	N	BASE	F	Main	0/0	16/16
8/19/2016	LALALA	OOLALALA	1	ABC_user	N	BASE	F	Main	0/0	15/15
8/19/2016	LALALA	OOLALALA	1	ABC_user	N	BASE	F	Main	7-Jul	19/19
8/19/2016	LALALA	OOLALALA	1	ABC_user	N	BASE	F	Main	0/0	147/147
8/19/2016	LALALA	OOLALALA	1	ABC_user	N	BASE	F	Main	0/0	152/152
8/19/2016	LALALA	OOLALALA	1	ABC_user	N	BASE	F	Main	21/21	156/156
8/19/2016	LALALA	OOLALALA	1	ABC_user	N	BASE	F	Main	21/21	156/156
8/19/2016	LALALA	OOLALALA	1	ABC_user	N	BASE	F	Main	21/21	156/156
8/19/2016	LALALA	OOLALALA	1	ABC_user	N	BASE	F	Main	21/21	156/156
8/19/2016	LALALA	OOLALALA	1	ABC_user	N	BASE	F	Main	0/0	93/93
8/19/2016	LALALA	OOLALALA	1	ABC_user	N	BASE	F	Main	0/0	100/100
8/19/2016	LALALA	OOLALALA	1	ABC_user	N	BASE	F	Main	0/0	100/100
8/19/2016	LALALA	OOLALALA	1	ABC_user	N	BASE	F	Main	15/15	100/100

Column Description

Column name	Description
Cur_date	Current date for the statistics collected
table_name	The name of the table.
table_type	BASE – a base table. MAT VIEW - a materialized view. (SA tables only) GBL TEMP - a global temporary table. PARTITION - a table partition (this table is for internal use only and cannot be used by Sybase IQ users). VIEW – a view. JVT – a join virtual table.
OwnerName	The owner of the table
server_type	IQ – an object created in the IQ store. SA – an object created in the SA store. All views are created in the SA store.
location	TEMP – IQ temporary store.

	MAIN – IQ store.
	SYSTEM – catalog store.
dbspaceName	Name of the dbspace where the table resides.
isPartitioned	'Y' if the column belongs to a partitioned table and has one or more partitions whose dbspace is different from the table partition's dbspace, 'N' if the column's table is not partitioned or each partition of the column resides in the same dbspace as the table partition.
columns	Number of table columns which are located on the given dbspace. If a column or one of the column-partitions is located on a dbspace, it is counted to be present on that dbspace. The result is displayed in the form n/N (n out of total N columns of the table are on the given dbspace).
indexes	Number of user defined indexes on the table which are located on the given dbspace. Displayed in the form n/N (n out of total N indexes on the table are on the given dbspace). This does not contain indexes which are system generated, such as FP indexes and HG indexes in the case of unique constraints
Size GB	Physical table size in GB

IQHC_DB_TABLESIZE.sh

=====

#!/bin/sh

#LOGDIR=/APP/ABC/LOGS/DBA/

cd /tmp

dt=`date +%F`

dbisql -c "dsn=MONDSN;" -nogui @/APP/ABC/DBA/SCRIPTS/IQ_NEW_HC/tablesiz_info.sql

cat -v /tmp/Tablesiz.sql | sed 's/M-oM-;M-?//g' | grep -vi execution > /tmp/Tablesiz1.sql

sed G /tmp/Tablesiz1.sql | sed 's/^\$/>># list1.out/g' >/tmp/Tablesiz2.sql

echo "commit;" >>/tmp/Tablesiz2.sql

dbisql -c "dsn=MONDSN;" -nogui @/tmp/Tablesiz2.sql

rm /tmp/Tablesiz2.sql /tmp/Tablesiz1.sql /tmp/Tablesiz.sql

tablesiz_info.sql

=====

```

select 'Insert into monuser.IQHC_TABLEGROWTH select cast(now() as
DATE), Ownername,Tablename,(KBytes/1024)/1024 as SizeGB ,
substring(X.dbspace_name,1,10) as DbspaceName, Y.isPartitioned,
Y.Table_type, Y.isRlv, Y.location, W.indexes, W.columns from
sp_iqtablesiz('' + Y.Table_owner+ '[' + Y.Table_name+']') ,
sysdbspace X, sp_iqtable(''+ Y.Table_name+'' , '' +
Y.Table_owner+'' ) Y, sp_iqdbspaceobjectinfo() W where
X.dbspace_id=Y.dbspace_id and w.dbspace_id=y.dbspace_id and
w.object_name=y.table_name and ownername=w.owner' from sp_iqtable()
Y where Y.table_owner<>'DBA';
output to '/tmp/Tablesiz.sql' format ascii quote '';
commit;

```

Table monuser.IQHC_TABLEGROWTH has to be created

6.3 Tables/stored procedures created on database during last week

This section shows **IQ stored procedure** created in last 1 week. (SQL: "select A.proc_name,C.user_name,B.creation_time from sysprocedure A, sysobject B,sysuser C where B.object_type=6 AND A.object_id=B.object_id AND A.creator=C.user_id AND A.creator NOT IN (0,3,6) AND datediff(dd,B.creation_time,getdate()) <= 7 order by B.creation_time desc").

Proc_Name	User_Name	Creation Date	Creation Time
'proc_reconciliation'	LALA	8/20/2016	37:23.0
'BIT_MASTER'	OLALA	8/19/2016	47:19.0
'DIA000_PA001'	OOLALA	8/18/2016	09:11.0
'APP_DATE'	LALA	8/18/2016	55:26.0
move2'	OLALA	8/17/2016	57:52.0

List of **IQ tables created** during the last week (SQL: "select a.table_id, b.table_name,b.table_type, a.create_time,a.update_time from sysiqtable a, systable b where a.table_id=b.table_id and create_time > '2016-08-20'").

New Table (Aug 16 - Aug 19)			
Table_Owner	Table_Name	Creation Date	Creation Time
OLALA	'ADR6'	'2016-08-19	14:45:12.000'
OLALA	'DFKK_VT_H'	'2016-08-18	17:30:26.000'
OLALA	'DFKK_VT_I'	'2016-08-18	17:30:23.000'
OLALA	'DFKK_VT_TR'	'2016-08-19	17:25:30.000'
OLALA	'DIA000_IA001'	'2016-08-18	18:01:00.000'
OLALA	'EKUN'	'2016-08-19	20:06:29.000'
OLALA	'FKKPREPACC'	'2016-08-19	12:46:10.000'
OLALA	'FKKVKP'	'2016-08-19	12:46:10.000'
OLALA	'FKK_SEC'	'2016-08-19	12:32:45.000'
OLALA	'FKK_SEC_C'	'2016-08-19	12:32:46.000'
OLALA	'OCCP_Master'	'2016-08-17	15:55:47.000'
OLALA	'T005T'	'2016-08-19	12:32:46.000'
OLALA	'T005U'	'2016-08-19	12:32:46.000'
OLALA	'TAS_MASTER'	'2016-08-17	13:42:00.000'
OLALA	'TE181T'	'2016-08-19	12:32:46.000'
OLALA	'TEST_04'	'2016-08-17	15:56:50.000'
OLALA	'TEST_04_APR'	'2016-08-18	16:45:14.000'
OLALA	'TEST_08_MAY'	'2016-08-18	14:58:22.000'

Index creation time:

SQL> select a.index_name, a.index_type, b.creation_time,a.table_id from sysindex a, sysobject b where a.object_id=b.object_id and a.index_name='ASIQ_IDX_T5865_C113_FP';

6.4 Invalid view on IQ database

This section shows list of invalid view in IQ (SQL: "select U.user_name , T.table_name as object_name from sysobject O, systab T, sysuser U where T.object_id=O.object_id and U.user_id=T.creator and O.status=2 ").

SYSOBJECT

status	TINYINT	<p>The status of the object. Values include:</p> <ul style="list-style-type: none"> 1 (valid) - The object is available for use by the database server. This status is synonymous with ENABLED. That is, if you ENABLE an object, the status changes to VALID. 2 (invalid) - An attempt to recompile the object after an internal operation has failed, for example, after a schema-altering modification to an object on which it depends. The database server continues to try to recompile the object whenever it is referenced in a statement. 4 (disabled) - The object has been explicitly disabled by the user, for example using an ALTER TABLE...DISABLE VIEW DEPENDENCIES statement.
object_type	TINYINT	<p>Type of object. Values include:</p> <ul style="list-style-type: none"> 1 - Table 2 - View 3 - Materialized view 4 - Column 5 - Index 6 - Procedure 7 - Trigger 8 - Event 9 - User 10 - Publication 11 - Remote type 12 - Login mapping 13 - JAR 14 - Java class 16 - Service 17 - Text configuration 18 - Dbspace

6.5 Identify Object Types IQ table

This section shows object type in IQ (SQL: "select o.creation_time,last_modified_at ,T.table_name, O.status, B.table_type, b.view_def from sysobject O, systab T, systable B where B.table_id=T.table_id and o.object_id=T.object_id and O.object_id=(select T.object_id from systab T where T.table_name='<object_name>')"

6.6 Identify Object Types IQ database

If you want to make a select statement that shows me all user tables, columns, data types and data length of the selected columns, this section shows object type in IQ

(SQL:

```
"select
  t.table_name,
  c.column_name,
  d.domain_name,
  c.width,
  c.scale
FROM SYS.SYSTAB t
JOIN SYS.SYSCOLUMN c
  ON t.table_id = c.table_id
join SYS.SYSDOMAIN d
  on d.domain_id = c.domain_id
where t.creator <> 0 --sysobjects type 'S'
and not exists (select * from sys.systab tv
  where tv.creator in (2, 22)
  and tv.table_id = t.table_id))"
```

6.7 Index types on IQ database

This section shows IQ count of tables and types of indexes (SQL: "select count(*), index_type from sp_iqindex() group by index_type;").

index_type	count()
Time	114
FP	69027
HG	1843
DATE	208
WD	3
DTTM	273

Column name	Description
index_type	The abbreviated index type (for example, HG , LF)

Refer: *sp_iqindexfragmentation* ('index ...') and *sp_iqindexinfo* // for index fragmentation info

Sybase IQ Index Types

This section explores in depth the reasons you might use each of the column index types.

- The Fast Projection (FP) Default Index Type**
 When you create a permanent table in a Sybase IQ database, IQ stores all column values in a default index. This default index, called an FP (Fast Projection) index, optimizes projections and enables certain kinds of search conditions to be evaluated.
- The Low Fast (LF) Index Type**
 This index is ideal for columns that have a very low number of unique values (under 1,000) such as sex, Yes/No, True/False, number of dependents, wage class, and so on. LF is the fastest index in Sybase IQ.
- The High Group (HG) Index Type**
 The High_Group index is commonly used for join columns with integer data types. It is also more commonly used than High_Non_Group because it handles GROUP BY efficiently.
- The High Non Group (HNG) Index Type**
 Add an HNG index when you need to do range searches.
- The Compare (CMP) Index Type**
 A Compare (CMP) index is an index on the relationship between two columns. You may create Compare

indexes on any two distinct columns with identical data types, precision, and scale. The CMP index stores the binary comparison (<, >, or =) of its two columns.

- The Containment (WD) Index Type
The Containment (WD) index allows you to store words from a column string of CHAR, VARCHAR, and LONG VARCHAR data.
- The Date (DATE), Time (TIME), and Datetime (DTTM) Index Types
Three index types are used to process queries involving date, time, or datetime quantities:
- TEXT Indexes
To use TEXT indexes, you must be specifically licensed to use the unstructured data analytics functionality.
- Optimizing Performance for Ad Hoc Joins
Indexes can be created to optimize ad hoc join performance.
- Selecting an Index
Certain criteria, such as the number of unique values, help you to identify appropriate index types for your data.

6.8 IQ Index Fragmentation

This section shows the fragmentation on indexes of a table in IQ: (SQL: **sp_iqindexfragmentation** ('table <owner.table>'))", this Stored procedure can be used to check the index fragmentation.

Stored procedure reports information about the percentage of page space taken up within the B-trees, garrays, and bitmap structures in Sybase IQ indexes.

Note: All percentages are truncated to the nearest percentage point. **HG** indexes also display the value of option **GARRAY_FILL_FACTOR_PERCENT**. Index types that use a B-tree also display the number of node (nonleaf) pages. These are **HG**, **LF**, **WD**, **DATE**, and **DTTM**.

For garrays, the fill percentage calculation does not take into account the reserved space within the garray groups, which is controlled by the **GARRAY_FILL_FACTOR_PERCENT** option. It specifies the percent of space on each **HG** garray pages to reserve for future incremental inserts into existing groups. The garray tries to pad out each group to include a pad of empty space set by the value. This space is used for rows added to existing index groups. Default value is 25.

GARRAY_PAGE_SPLIT_PAD_PERCENT option, determines per-page fill factor during page splits on the garray and specifies the percent of space on each **HG** garray page to reserve for future incremental inserts. Splits of a garray page try to leave that percentage empty. This space is used for rows added to new index groups. Default value: 25.

sp_iqrowdensity ('table <owner>. <table_name>') //This stored procedure can be used to report **row fragmentation**

Additionally,
`sp_iqindex ('<table_name>')0`
`sp_iqcolumn ('<table_name>')`
`sp_iqindexfragmentation ('table <owner>. <table_name>')`
`sp_iqindexsize ('<owner>. <table_name>.<index_name>')`
`sp_iqindexinfo ('table <owner>. <table_name>')`
`sp_iqspaceinfo('table <owner>. <table_name>')`
`sp_iqcheckdb('verify index <owner>. <table_name>.<index_name>')`
`CALL sa_index_density('Customers');`

To rebuild index if issue found:

- Store procedure **sp_iqrebuildindex** can be used to rebuild the indexes and reduce the fragmentation.

e.g.

```
sp_iqrebuildindex (<table_name>, <index_clause>)
```

6.9 Identify list of tables in a View or store procedure in IQ

“**sp_iqview**” : Displays information about views in a database.

sp_iqview ([view_name],[view_owner],[view_type])

SQL> Select view_name, view_owner from sp_iqview() where view_def like '%TABLE_NAME%'

SQL> Select proc_name, creator from sysprocedure where proc_defn like '%TABLE_NAME%'

6.10 Find details of procedure/table/view IQ

“**sp_iqhelp**” : Displays information about system and user-defined objects and data types.

sp_iqhelp [obj-name], [obj-owner], [obj-category], [obj-type]

Display detailed information about the procedure *sp_customer_list*:

sp_iqhelp sp_customer_list

Display detailed information about the table *sale*:

sp_iqhelp sale

6.11 IQ USER & ROLE

This section help find list of grants provided to particular user in IQ

```
select * from sysuserauth
select * from sysloginpolicy
select * from sysiqspolicy
select * from sysiqspolicyoption;
select * from SYSIQLSMEMBERS
select * from SYSIQLOGINPOLICYLSINFO
```

1. My roles

```
select role_name,grant_type from sp_displayroles()
```

2. Priviledge assigned to a ROLE

```
sp_displayroles() <role_name>
```

3.

```
sp_objectpermission '<user_name>'
```

4.

```
select * from sysrolegrants
```

5.Last login time for IQ USER

```
select user_name, last_login_time, login_policy_id from sysuser
where password is not null and last_login_time is not null
```

6. Users with DBA privileges

```
select * from sysrolegrants where role_name like '%DBA%'
```

```
/* SAP note 2518909 - How to find permissions granted to users in
SAP IQ */
```

6.12 IQ Logical Server policy assigned users.

This section help find list all the logical server and login policy created, also help list user associated with-in IQ:

```
select d.user_name, a.login_policy_name, b.ls_name , b.server_name ,
d.last_login_time from sysloginpolicy a, SYSIQLSMEMBERS b ,
SYSIQLLOGINPOLICYLSINFO c , sysuser d where
c.login_policy_id=d.login_policy_id and
a.login_policy_id=c.login_policy_id and c.ls_id=b.ls_id and
d.password is not null
```

Login Policy Option(parameter) Configuration:

```
select * from sysiqlspolicyoption;
select * from sysloginpolicy
```

LOGICAL SERVER - Nodes:

```
select * from SYSIQLSMEMBERS
select * from sysiqlspolicy
```

6.13 Monitor last time an object was accessed in IQ

There is a way to find out the last time an object (table/view/st proc) was accessed by an application in IQ.

You enable it, then can run reports against the data over time on things like table and index use, tables and indexes not used, etc.

`sp_iqworkmon` Procedure

It Controls collection of workload monitor usage information, and reports monitoring collection status.
`sp_iqworkmon` collects information for all SQL statements.

Note: Usage is collected only for SQL statements containing a **FROM** clause; for example, **SELECT**, **UPDATE**, and **DELETE**.

See also

- * `sp_iqcolumnuse`
- * `sp_iqindexadvice`
- * `sp_iqindexuse`
- * `sp_iqtableuse`
- * `sp_iqunusedcolumn`
- * `sp_iqunusedindex`
- * `sp_iqunusedtable`

6.14 IQ Partitioned Tables

This section help find list of Partitioned tables in IQ

List of all the Partitioned tables in IQ

```
SQL1> select b.table_name,b.table_type,a.create_time,a.update_time,z.dbpace_name from sysiqtable a,
systable b, sysfile z where z.file_id=b.file_id and a.table_id=b.table_id and a.table_id in (select distinct
table_id from syspartitions)
```

Details of particular table which is partitioned

```
SQL2> select partition_id,partition_values,partition_name from syspartitions where table_id in (select
table_id from systable where table_name='<table_name>')
```

6.15 Backup Summary

No daily Full Backup done on production IQ database system. Only monthly full backups and weekly incremental backups are done. We recommend scheduling weekly full database backup of Production database and daily incremental backup.

Impact on Business:

Data loss of up to 7 days.

Below is the backup summary from production IQ (SQL: *select substring(Name,1,40) as Name, Value from sp_iqstatus() where Name like '%Backup%'*)

Output:

Name	Value
Last Full Backup Time:	8/7/2016 18:22
Last Full Backup ID:	78249976
Last Backup Type:	FULL
Last Backup Time:	8/7/2016 18:22
Last Backup ID:	78249976
Blocks in next ISI Backup:	1817088679 Blocks: =55453Gb
Blocks in next ISF Backup:	1817088679 Blocks: =55453Gb

Below is the backup history from production IQ (SQL: *select bu_id, bu_time, dependson_id, type, cmd from sysiqbackuphistory*)

Output:

bu_id	bu_time	dependson_id	cmd
10792835	3/1/2016 8:24	0	backup database to '/qwer/sybase_IQ/UPGRADE/SP10_PL02/BACKUP/DB_BACKUP/bkp.dat1' size 50000000
11141824	3/4/2016 8:30	0	backup database to '/qwer/sybase_IQ/BACKUP_PRODUCTION/FULL_file1' size 50000000
12746794	3/17/2016 19:21	0	backup database to '/qwer/sybase_IQ/BACKUP_PRODUCTION/Full_170316.dat1' size 50000000
12840849	3/18/2016 18:09	12746794	backup database incremental to '/qwer/sybase_IQ/BACKUP_PRODUCTION/INCR_Daily_180316.incr' size 50000000
14705480	4/2/2016 14:41	0	backup database to '/qwer/sybase_IQ/BACKUP_PRODUCTION/Full_02042016.dat1' size 50000000
16592472	4/13/2016 19:15	0	backup database to '/qwer/sybase_IQ/BACKUP_TEST_VIJAY/Full_file1.13' size 50000000
16606328	4/13/2016 21:01	16592472	backup database incremental to '/qwer/sybase_IQ/BACKUP_TEST_VIJAY/INCR_Daily_file1.13' size 50000000
16709838	4/14/2016 10:09	16606328	backup database incremental to '/qwer/sybase_IQ/BACKUP_TEST_VIJAY/INCR_Daily_file1.14' size 50000000
16925234	4/15/2016 13:09	16709838	backup database incremental to '/qwer/sybase_IQ/BACKUP_TEST_VIJAY/INCR_Daily_file1.15' size 50000000
17530053	4/18/2016 14:17	16925234	backup database incremental to '/qwer/sybase_IQ/BACKUP_TEST_VIJAY/INCR_Daily_file1.18' size 50000000
17609351	4/18/2016 22:00	17530053	backup database incremental to '/qwer/sybase_IQ/BACKUP_TEST_VIJAY/INCR_Daily_file1.18' size 50000000

17813647	4/19/2016 22:00	17609351	backup database incremental to '/qwer/sybase_IQ/BACKUP_TEST_VIJAY/INCR_Daily_file1.19' size 50000000
18007763	4/20/2016 22:00	17813647	backup database incremental to '/qwer/sybase_IQ/BACKUP_TEST_VIJAY/INCR_Daily_file1.20' size 50000000
18196390	4/21/2016 22:00	18007763	backup database incremental to '/qwer/sybase_IQ/BACKUP_TEST_VIJAY/INCR_Daily_file1.21' size 50000000
18379520	4/22/2016 22:00	18196390	backup database incremental to '/qwer/sybase_IQ/BACKUP_TEST_VIJAY/INCR_Daily_file1.22' size 50000000
18560140	4/23/2016 22:00	16592472	backup database incremental since full to '/qwer/sybase_IQ/BACKUP_TEST_VIJAY/INCR_SIN_FULL_file1.23' size 50000000
18730244	4/24/2016 22:00	18560140	backup database incremental to '/qwer/sybase_IQ/BACKUP_TEST_VIJAY/INCR_Daily_file1.24' size 50000000
18912247	4/25/2016 22:00	18730244	backup database incremental to '/qwer/sybase_IQ/BACKUP_TEST_VIJAY/INCR_Daily_file1.25' size 50000000
19099538	4/26/2016 22:00	18912247	backup database incremental to '/qwer/sybase_IQ/BACKUP_TEST_VIJAY/INCR_Daily_file1.26' size 50000000
19282696	4/27/2016 22:00	19099538	backup database incremental to '/qwer/sybase_IQ/BACKUP_TEST_VIJAY/INCR_Daily_file1.27' size 50000000
19476412	4/28/2016 22:00	19282696	backup database incremental to '/qwer/sybase_IQ/BACKUP_TEST_VIJAY/INCR_Daily_file1.28' size 50000000

Column Description

Column name	Description
bu_id	Transaction identifier of the checkpoint of the operation. Backup ID for backup operations.
bu_time	Time of backup operation that is recorded in backup record.
type	Backup type: 0 = FULL 1 = INCREMENTAL 2 = INCREMENTAL SINCE FULL
dependson_id	NULL for FULL backup
cmd	Full text of command

Also, Refer: *sp_iqbackupsummary, sp_iqbackupdetails*

Backup Memory

– In an ideal situation, amount of memory used during a backup is a function of

- number of cpus
- number of main or local store dbspaces to be backed up
- block factor
- IQ block size (as seen in column 'block_size' in sys.sysqiinfo)

Approximate memory used by backup process (z) will be

- $y = \max(2 * \text{number_of_cpus}, 8 * \text{number_of_main_or_local_dbspaces})$
- $z = (y * 20) * (\text{blockfactor} * \text{block_size})$

Backup Memory (example)

- dbspaces = 50
- block factor = 100
- number of cpus = 4
- block_size = 8,192
- 'y' is $\max(8, 400) \Rightarrow y=400$
- 'z' is $(400 * 20) * (100 * 8,192) \Rightarrow 6.5\text{GB}$

BLOCK FACTOR <integer>

specify the number of blocks to write at one time. The value must be greater than 0, or SAP IQ generates an error message. Its default is 25 for UNIX systems and 15 for Windows systems (to accommodate the smaller fixed tape block sizes). This clause effectively controls the amount of memory used for buffers. The actual amount of memory is this value times the block size times the number of threads used to extract data from the database. Set BLOCK FACTOR to at least 25.

Syntax

```
+++++
```

BACKUP DATABASE

```
[ backup-option ... ]
  TO <archive_device> [ archive-option... ]
  ... [ WITH COMMENT <string> ]
```

backup-option - (back to Syntax)

```
{ READWRITE FILES ONLY |
  READONLY dbspace-or-file [, ... ] }
CRC { ON | OFF }
ATTENDED { ON | OFF }
BLOCK FACTOR <integer>
{ FULL | INCREMENTAL | INCREMENTAL SINCE FULL }
VIRTUAL { DECOUPLED |
  ENCAPSULATED <'shell_command'> }
POINT IN TIME RECOVERY LOGS ONLY
WITH COMMENT <comment>
```

dbspace-or-file - (back to backup-option)

```
{ DBSPACES identifier-list | FILES <identifier-list> | <archive-root> }
```

identifier-list - (back to dbspace-or-file)

```
<identifier> [, ... ]
```

archive-option - (back to Syntax)

```
SIZE <integer> STACKER <integer>
```

```
+++++
```

Refer below link for IQ backup:

http://help.sap.com/saphelp_iq1608_iqbackup/helpdata/en/a6/13fdea84f21015aaa499e4bc801d20/content.htm

6.16 IQ DB license information

SQL> sp_iqlmconfig store procedure

Property	Value
Licence Notice	
Edition	EE
License Type	C?
Application Type	IQ
IQ_CORE License Count in use	20 (CPU core based)
Optional license in use : IQ_UDA	No (Disallowed)
Optional license in use : IQ_LOB	No (Disallowed)
Optional license in use: IQ_SECURITY	No (Disallowed)
Optional license in use: IQ_MPXNODE	Yes
Optional license in use: IQ_VLDBMGMT	No (Allowed)
IQ_VLDBMGMT License Count in use	0 (Max Allowed : 900)
Optional license in use: IQ_UDF	No (Disallowed)
Optional license in use: IQ_IDA	No (Disallowed)
Optional license in use: IQ_URIDA	No (Disallowed)
Email Severity	NONE
SMTP Host	smtp
SMTP Port	25
Email Sender	ilp
Email Recipients	iqf

6.17 IQ Database Upgrade info

How to check whether "ALTER DATABASE UPGRADE" has been done?

Check SYSHISTORY system view.

1. When "ALTER DATABASE UPGRADE" has been done, operation=UPGRADE row is added.
2. Compare version field for most recent UPGRADE row and LAST_START row.

SQL> select operation, version, last_time from syshistory order by version

The version string can be checked in the SYSHISTORY system view in second part for product version string:

select @@version

7 Historic statistics collection scripts

7.1 Collect statistics for TOP transaction in IQ

Below "sh" script can help in populating data by scheduling shell script in crontab and inserting into a Monitoring table e.g IQHC_HIST_STAT here, to store history data and can be viewed later in terms of graphs:

1. Create a table on IQ DB as follows from any DB node:

```
Create table monuser.IQHC_HIST_TRANS
(
SAMPLE_TIME timestamp,
CLIENT_ADDRESS varchar(30),
IQHOSTNAME varchar(30),
ConnHandle numeric(50),
IQconnID numeric(50),
UserID varchar(50),
ReqType varchar(50),
IQthreads numeric(10),
ClientTool varchar(50),
ConnCreateTime timestamp,
LastReqTime timestamp,
INACTIVE_SINCE_SECS numeric(50),
TempTableSpaceKB numeric(50),
TempWorkSpaceKB numeric(50),
CmdLine varchar(225)
)
```

2. Create shell script below and schedule it every 15min on all DB Nodes of IQ to be monitored

```
IQHC_HIST_STATS.sh
+++++
#!/bin/sh

#Source the env file
source /APP/ABC/BINARY/IQ-16_0/IQ-16_0.sh

cd /tmp
dt=`date +%F`

##### Transaction History Info #####
dbisql -c "dsn=MONDSN;" -nogui "Insert into monuser.IQHC_HIST_TRANS select CURRENT_TIMESTAMP AS
SAMPLETIME, substring("CONNECTION_PROPERTY"('NodeAddress','a"."ConnHandle"),1,20) as
"ClientAddress",substring(b.Name,1,20) as
IQHOSTNAME,"a"."ConnHandle","a"."IQconnID",substring("a"."Userid",1,30) as UserID,
substring("a"."ReqType",1,30) as ReqType , a.IQthreads, substring("a"."Name",1,30) as
Name,substring("a"."ConnCreateTime",1,30) as ConnCreateTime, substring("a"."LastReqTime",1,30) as
LastReqTime,datediff(ss,a.LastReqTime, now()) as INACTIVE_SINCE_SECS,
"a"."TempTableSpaceKB","a"."TempWorkSpaceKB","b"."CmdLine" from "dbo"."sp_iqconnection"() as
"a","dbo"."sp_iqcontext"() as "b" where "a"."ConnHandle" = "b"."ConnHandle" order by "ConnCreateTime"
asc;commit;"
+++++
```



```
SQL> select * from IQHC_HIST_TRANS where inactive_since_secs > 10 and
sample_time between today()-1 and getdate() and CmdLine<>'NO COMMAND' and
CmdLine<>'')
```

```
SQL2> select * from IQHC_HIST_TRANS where sample_time between '2016-08-29 13:25:00.000' and '2016-08-29 13:55:00.000'
```

Output:

AMPLI_TIME	CLIENT_ADDRESS	KPOZONE	Counting_KPOZone	ReType	KPOZoneClassified	CountedZoneLastTime	INACTIVE_ZONE	TempLampCount	TempLampCount2	Online
20-08-2018 13:00	20.341.65.31	P	36225	351818 DATA	0 SCC_O_36018-18-16-00-99	20-08-2018 17:29-20-08-13:29	13	0	0	NO CNO-CAMANO
20-08-2018 13:00	20.341.65.31	P	36475	379417 DATA	0 SCC_O_36018-18-20-00-00	20-08-2018 12:40-20-08-13:29	12	0	0	NO CNO-CAMANO
20-08-2018 13:00	20.341.65.32	P	36554	352018 NORMAL ENDC	0 SCC_O_36018-18-16-00-99	20-08-2018 18:17-20-08-13:29	9	0	0	Insert into "mouse": "KdGc_HIST_TRANS" select
20-08-2018 13:00			6	18 DATA	0 SCC_O_36018-18-17-00-99	20-08-2018 18:17-20-08-13:29	9	0	0	NO CNO-CAMANO
20-08-2018 13:00			8	20 DATA	0 SCC_O_36018-18-17-00-99	20-08-2018 18:17-20-08-13:29	9	0	0	NO CNO-CAMANO
20-08-2018 13:00			12	25 DATA	0 SCC_O_36018-18-17-00-99	20-08-2018 17:29-20-08-13:29	11	0	0	NO CNO-CAMANO
20-08-2018 13:00			21	35 DATA	0 SCC_O_36018-18-17-00-99	20-08-2018 17:29-20-08-13:29	11	0	0	NO CNO-CAMANO
20-08-2018 13:00	20.341.65.32	P	36554	352018 NORMAL ENDC	0 SCC_O_36018-18-16-00-99	20-08-2018 18:17-20-08-13:29	9	0	0	NO CNO-CAMANO
20-08-2018 13:00			30	40 PRETEXT	0 SCC_O_36018-18-16-00-99	20-08-2018 18:17-20-08-13:29	40	0	0	NO CNO-CAMANO
20-08-2018 13:00			13438	337994 DATA	0 SCC_O_36018-18-05-03-42	20-08-2018 05:15-20-08-13:29	9	0	0	NO CNO-CAMANO
20-08-2018 13:00	20.328.104.64	P	18875	477951 NORMAL PRETEXT	0 SQD_O_361800	20-08-2018 13:18-20-08-13:29	24	0	0	0
20-08-2018 13:00	20.328.104.64	P	18875	477951 NORMAL PRETEXT	0 SQD_O_361800	20-08-2018 13:18-20-08-13:29	24	0	0	NO CNO-CAMANO
20-08-2018 13:00	20.341.65.32	P	36554	477951 DATA	0 SCC_O_36018-18-16-00-99	20-08-2018 18:17-20-08-13:29	17	0	0	NO CNO-CAMANO
20-08-2018 13:00	20.341.65.32	P	18896	477951 DATA	0 SCC_O_36018-18-16-00-99	20-08-2018 18:17-20-08-13:29	17	0	0	NO CNO-CAMANO
20-08-2018 13:00	20.341.65.32	P	18896	477951 DATA	0 SCC_O_36018-18-16-00-99	20-08-2018 18:17-20-08-13:29	17	0	0	NO CNO-CAMANO
20-08-2018 13:00			18898	477951 NORMAL ENDC	0 SQD_O_361800	20-08-2018 13:30-20-08-13:30	0	0	0	Insert into "mouse": "KdGc_HIST_TRANS" select
20-08-2018 13:00	20.341.65.31	P	36225	351818 DATA	0 SCC_O_36018-18-16-00-99	20-08-2018 17:29-20-08-13:29	13	0	0	NO CNO-CAMANO
20-08-2018 13:00	20.341.65.31	P	36475	379417 DATA	0 SCC_O_36018-18-20-00-00	20-08-2018 12:40-20-08-13:29	11	0	0	NO CNO-CAMANO
20-08-2018 13:00	20.341.65.32	P	36554	352021 NORMAL ENDC	0 SCC_O_36018-18-16-00-99	20-08-2018 18:17-20-08-13:29	9	0	0	Insert into "mouse": "KdGc_HIST_TRANS" select
20-08-2018 13:00			6	18 DATA	0 SCC_O_36018-18-17-00-99	20-08-2018 18:17-20-08-13:29	9	0	0	NO CNO-CAMANO
20-08-2018 13:00			8	20 DATA	0 SCC_O_36018-18-17-00-99	20-08-2018 18:17-20-08-13:29	9	0	0	NO CNO-CAMANO
20-08-2018 13:00			12	25 DATA	0 SCC_O_36018-18-17-00-99	20-08-2018 17:29-20-08-13:29	11	0	0	NO CNO-CAMANO
20-08-2018 13:00			21	35 DATA	0 SCC_O_36018-18-17-00-99	20-08-2018 17:29-20-08-13:29	11	0	0	NO CNO-CAMANO
20-08-2018 13:00	20.341.65.32	P	36554	352018 NORMAL ENDC	0 SCC_O_36018-18-16-00-99	20-08-2018 18:17-20-08-13:29	9	0	0	NO CNO-CAMANO
20-08-2018 13:00			30	40 PRETEXT	0 SCC_O_36018-18-16-00-99	20-08-2018 18:17-20-08-13:29	40	0	0	NO CNO-CAMANO
20-08-2018 13:00			13438	337994 DATA	0 SCC_O_36018-18-05-03-42	20-08-2018 05:15-20-08-13:29	9	0	0	NO CNO-CAMANO
20-08-2018 13:00	20.328.104.64	P	18875	477951 NORMAL PRETEXT	0 SQD_O_361800	20-08-2018 13:18-20-08-13:30	577	0	0	0
20-08-2018 13:00	20.328.104.64	P	18875	477951 NORMAL PRETEXT	0 SQD_O_361800	20-08-2018 13:18-20-08-13:30	577	0	0	NO CNO-CAMANO
20-08-2018 13:00	20.341.65.32	P	36554	477951 DATA	0 SCC_O_36018-18-16-00-99	20-08-2018 18:17-20-08-13:29	17	0	0	NO CNO-CAMANO
20-08-2018 13:00	20.341.65.32	P	18896	477951 DATA	0 SCC_O_36018-18-16-00-99	20-08-2018 18:17-20-08-13:29	17	0	0	NO CNO-CAMANO
20-08-2018 13:00	20.341.65.32	P	18896	477951 DATA	0 SCC_O_36018-18-16-00-99	20-08-2018 18:17-20-08-13:29	17	0	0	NO CNO-CAMANO
20-08-2018 13:00			18911	477986 NORMAL ENDC	0 SQD_O_361800	20-08-2018 13:30-20-08-13:40	0	0	0	Insert into "mouse": "KdGc_HIST_TRANS" select
20-08-2018 13:00	20.341.65.31	P	36225	351818 DATA	0 SCC_O_36018-18-16-00-99	20-08-2018 17:29-20-08-13:40	12	0	0	NO CNO-CAMANO
20-08-2018 13:00	20.341.65.31	P	36475	379417 DATA	0 SCC_O_36018-18-20-00-00	20-08-2018 12:40-20-08-13:40	11	0	0	NO CNO-CAMANO
20-08-2018 13:00	20.341.65.32	P	36554	352018 NORMAL ENDC	0 SCC_O_36018-18-16-00-99	20-08-2018 18:17-20-08-13:41	9	0	0	NO CNO-CAMANO
20-08-2018 13:00			36557	352040 NORMAL ENDC	0 SQD_O_360180470	20-08-2018 13:00-20-08-13:50	0	0	0	Insert into "mouse": "KdGc_HIST_TRANS" select
20-08-2018 13:00			6	18 DATA	0 SCC_O_36018-18-17-00-99	20-08-2018 18:17-20-08-13:40	8	0	0	NO CNO-CAMANO
20-08-2018 13:00			8	20 DATA	0 SCC_O_36018-18-17-00-99	20-08-2018 18:17-20-08-13:40	8	0	0	NO CNO-CAMANO
20-08-2018 13:00			12	25 DATA	0 SCC_O_36018-18-17-00-99	20-08-2018 17:29-20-08-13:40	11	0	0	NO CNO-CAMANO
20-08-2018 13:00			21	35 DATA	0 SCC_O_36018-18-17-00-99	20-08-2018 17:29-20-08-13:40	11	0	0	NO CNO-CAMANO
20-08-2018 13:00	20.341.65.32	P	36554	352018 NORMAL ENDC	0 SCC_O_36018-18-16-00-99	20-08-2018 18:17-20-08-13:44	840	0	0	NO CNO-CAMANO

7.2 Collect statistics for connection / threads / Memory areas

We can schedule as below "sh" script. This can help in populating data by scheduling shell script in crontab and inserting into a Monitoring table e.g IQHC_CONNECTMAIN here, to store history data and can be viewed later in terms of graphs:

1. Create a table on IQ DB as follows from any DB node:

```
Create table monuser.IQHC_HIST_STATS (SAMPLE_TIME timestamp,IQHOSTNAME varchar(128),
Parameter varchar(100), Value numeric(50))
```

2. Create shell script below and schedule it every 15min on all DB Nodes of IQ to be monitored

IQHC_HIST_STATS.sh

```
+++++
#!/bin/sh

#Source the env file
source /APP/ABC/BINARY/IQ-16_0/IQ-16_0.sh

dt=`date +%F`

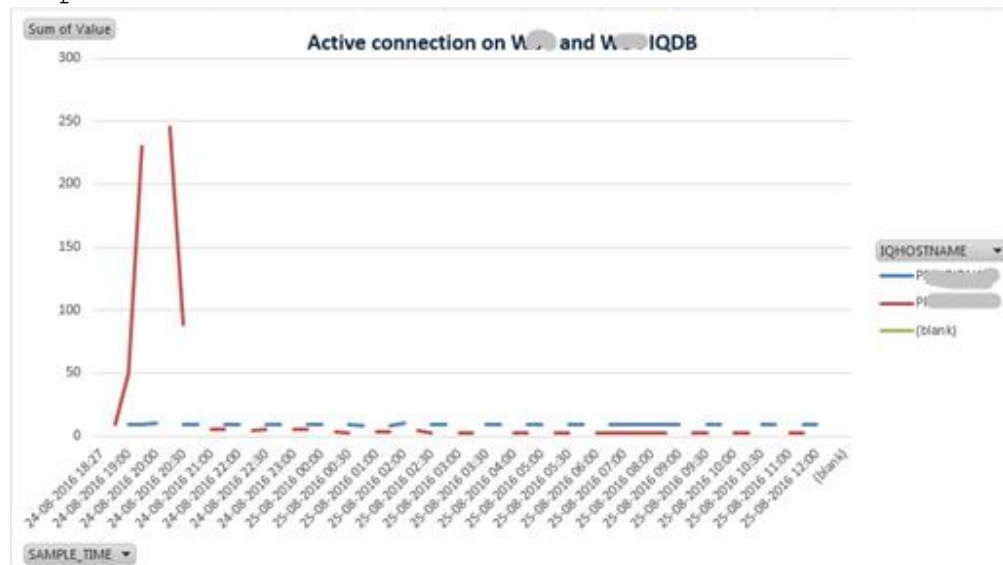
dbisql -c "dsn=MONDSN;" -nogui "Insert into monuser.IQHC_CONNECTMAIN select
cast(now() as TIMESTAMP), @@servername, substring(stat_name,1,50) as stat_name,
substring(stat_value,1,20) stat_value from sp_iqstatistics() where stat_name in (
'MainCachePagesInUsePercentage','TempCachePagesInUsePercentage','TempCacheCurrentSiz
e','MainCacheCurrentSize','ThreadsInUse','ThreadsFree',
'ConnectionsActive','OperationsActiveLoadTableStatements');commit;"
+++++
```

Result can be pulled in graph as follows for connection/thread/memory areas:

7.2.1 IQ Active connections

```
SQL1> Select SAMPLE_TIME, IQHOSTNAME,VALUE FROM monuser.IQHC_HIST_STATS WHERE
PARAMETER='ConnectionsActive';
```

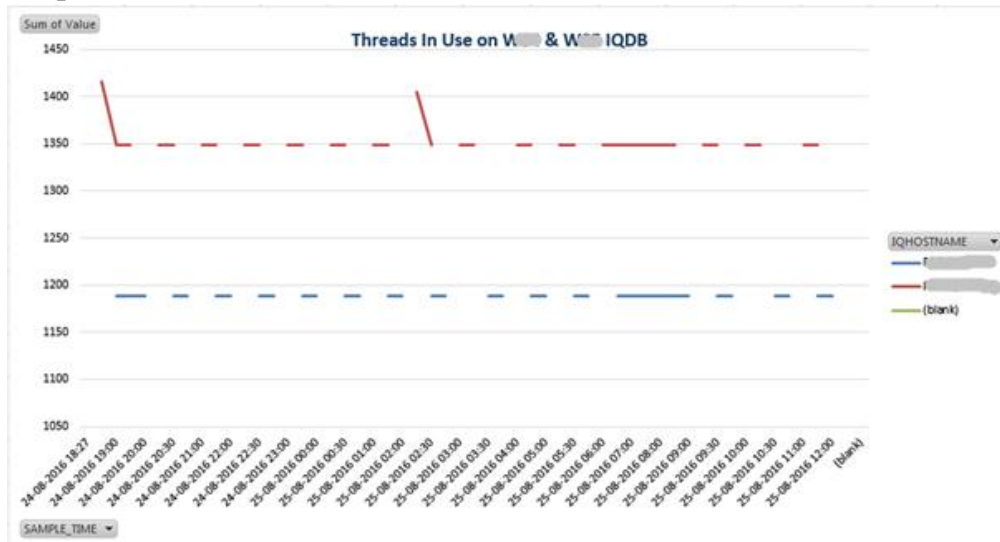
Output :



7.2.2 IQ ThreadsInUse

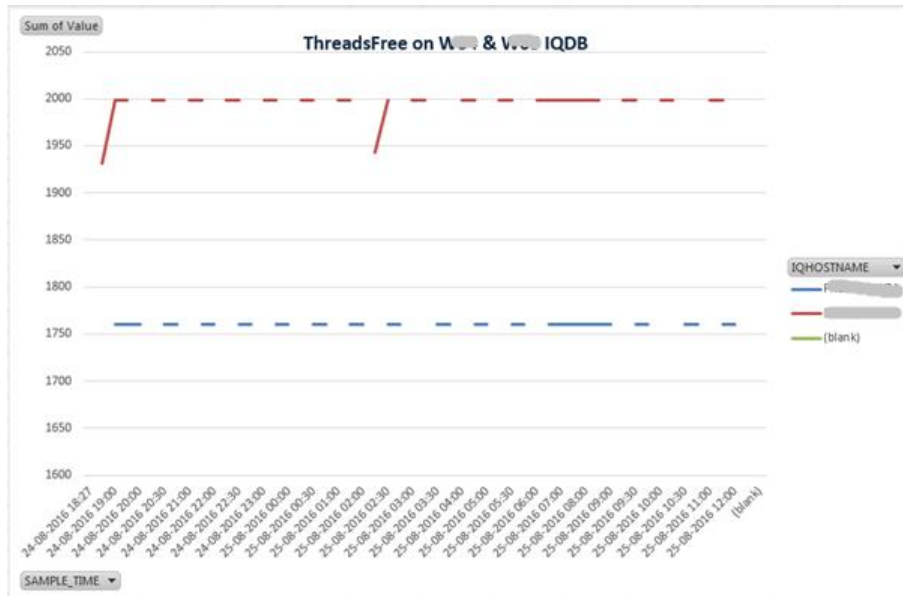
```
SQL2> Select SAMPLE_TIME, IQHOSTNAME,VALUE FROM monuser.IQHC_HIST_STATS WHERE
PARAMETER='ThreadsInUse' ;
```

Output :



7.2.3 IQ ThreadsFree

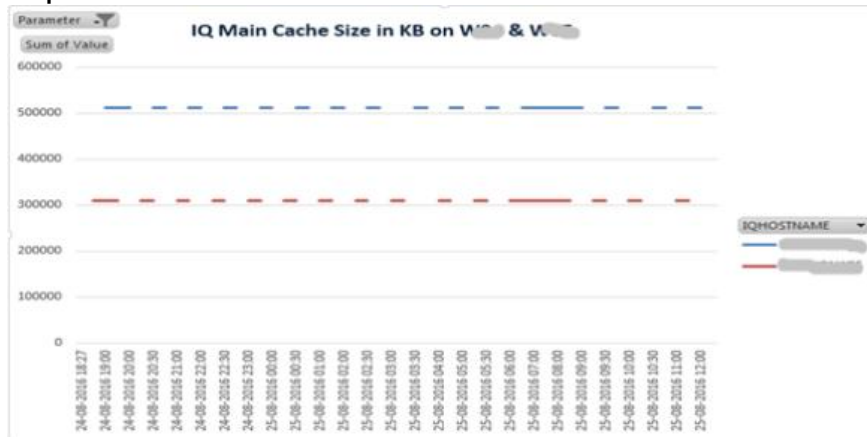
```
SQL3> Select SAMPLE_TIME, IQHOSTNAME,VALUE FROM monuser.IQHC_HIST_STATS WHERE
PARAMETER='ThreadsFree' ;
```



7.2.4 IQ Main cache Size

SQL4> Select SAMPLE_TIME, IQHOSTNAME, VALUE FROM monuser.IQHC_HIST_STATS WHERE
PARAMETER='MainCacheCurrentSize';

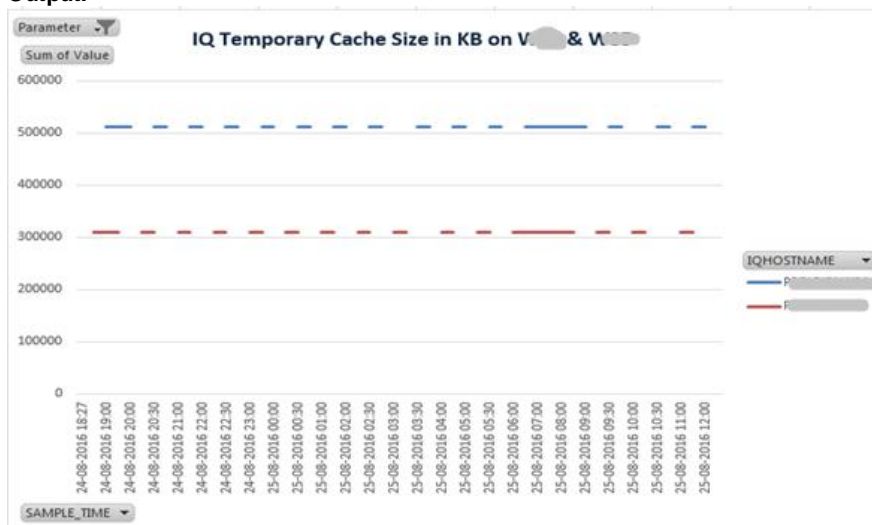
Output:



7.2.5 IQ Temporary cache Size

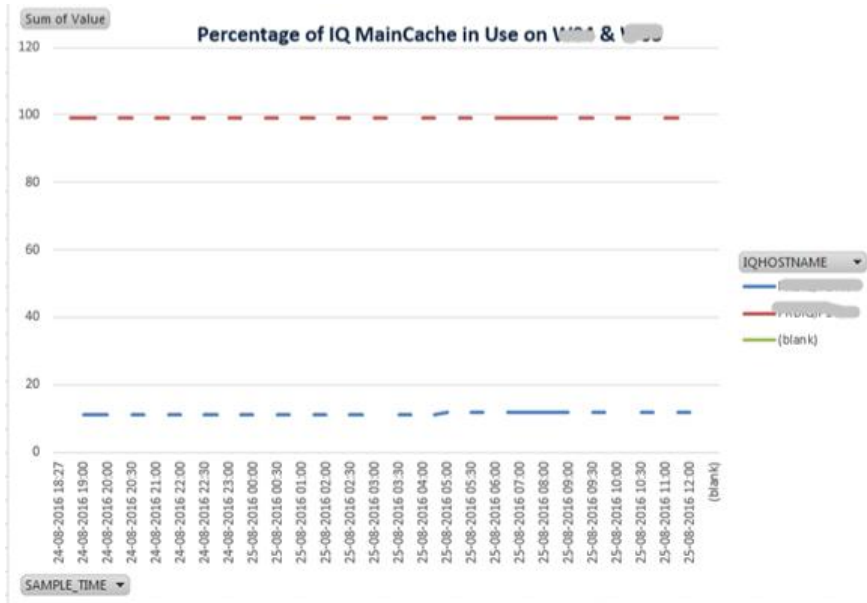
SQL5> Select SAMPLE_TIME, IQHOSTNAME, VALUE FROM monuser.IQHC_HIST_STATS WHERE
PARAMETER='TempCacheCurrentSize';

Output:



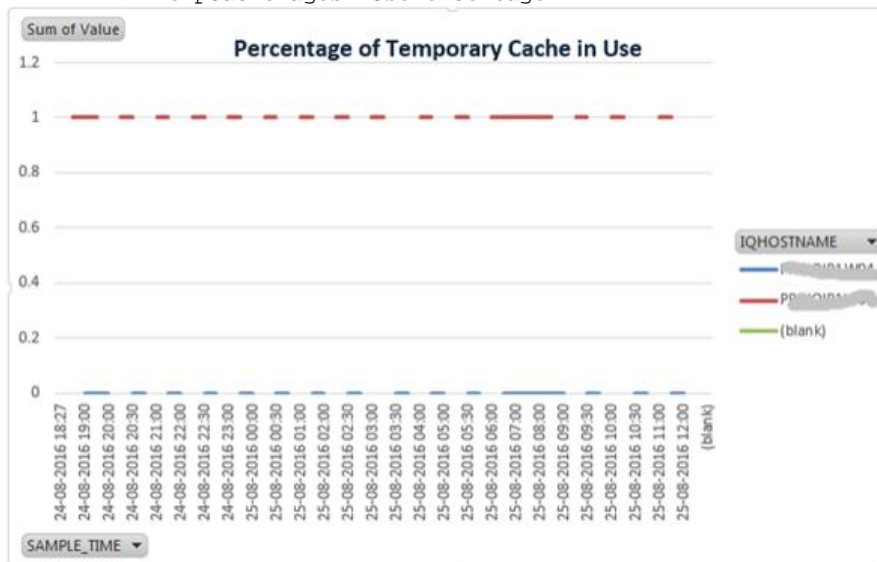
7.2.6 IQ Temporary cache Usage %

SQL6> Select SAMPLE_TIME, IQHOSTNAME,VALUE FROM monuser.IQHC_HIST_STATS WHERE
PARAMETER='MainCachePagesInUsePercentage';



7.2.7 IQ Temporary cache Usage %

SQL7> Select SAMPLE_TIME, IQHOSTNAME,VALUE FROM monuser.IQHC_HIST_STATS WHERE
PARAMETER='TempCachePagesInUsePercentage';



8 Appendix

8.1 DB Startup Parameters

Parameter Description

- **@data iqsrv16 database server option**
Reads in options from the specified environment variable or configuration file.
- **@envvar iqsrv16 Server Option**
Reads in command-line switches from the supplied environment variable.
- **@filename iqsrv16 Server Option**
Read in switches from configuration file.
- **-c iqsrv16 Server Option**
Sets initial memory reserved for caching catalog store pages and other server information.

For this many users	On these platforms	Set -c to this minimum value or higher
up to 1000	64-bit only	64MB
up to 200	64-bit	48MB (start_iq default for 64-bit); larger numbers of users may benefit from 64MB
up to 200	32-bit	32MB (start_iq default for 32-bit)

Can use specific upper and lower limits for the catalog store cache size using the -ch and -cl parameters

- **-al iqsrv16 Server Option**
Extends LOGIN_MODE for LDAPUA only to a select number of users using Standard authentication
- **-ca iqsrv16 database server option**
Enforces a static cache size.
- **-cc iqsrv16 database server option**
Collects information about database pages to be used for cache warming the next time the database is started.
- **-ch iqsrv16 Server Option**
Set catalog store cache size upper limit in bytes.
- **-cl iqsrv16 database server option**
Sets a minimum cache size as a lower limit to dynamic cache resizing.
- **-cp iqsrv16 database server option**
Specifies an additional set of directories or JAR files in which to search for classes.
- **-cr iqsrv16 database server option**
Reloads (warms) the cache with database pages using information collected the last time the database was run.
- **-cs iqsrv16 database server option**
Displays statistics related to dynamic cache sizing in the database server messages window.
- **-cv iqsrv16 database server option**
Controls the appearance of messages about cache warming in the database server messages window.
- **-dt iqsrv16 database server option**
Specifies the directory where temporary files are stored.
- **-ec iqsrv16 database server option**
Uses transport-layer security or simple encryption to encrypt all command sequence communication protocol packets (such as DBLib and ODBC) transmitted to and from all clients. TDS packets aren't encrypted.
- **-ep iqsrv16 database server option**
Prompts the user for the encryption key upon starting a strongly encrypted database.
- **-es iqsrv16 database server option**
Allows unencrypted connections over shared memory.

- **-fips iqsrv16 database server option**
Requires that only FIPS-certified algorithms can be used for strong database and communication encryption.
- **-ga iqsrv16 database server option**
Unloads the database after the last non-HTTP client connection disconnects.
- **-gb iqsrv16 database server option**
Sets the server process priority class.
- **-gc iqsrv16 database server option**
Sets the maximum interval between checkpoints.
- **-gd iqsrv16 database server option**
Sets the privileges required to start or stop a database on a running database server.
- **-ge iqsrv16 database server option**
Sets the stack size for external functions.
- **-gf iqsrv16 database server option**
Disables firing of triggers by the server.
- **-gk iqsrv16 database server option**
Sets the privileges required to stop the database server.
- **-gl iqsrv16 Server Option**
Set the permission required to load data using LOAD TABLE.
- **-gm iqsrv16 database server option**
Limits the number of concurrent connections to the database server.
- **-gn iqsrv16 Server Option**
Sets the number of execution threads that are used for the catalog store and connectivity while running with multiple users.
- **-gp iqsrv16 database server option**
Sets the maximum allowed database page size.
- **-gr iqsrv16 Server Option**
Sets the maximum length of time, in minutes, that the database server takes to recover from system failure.
- **-gss iqsrv16 Server Option**
Sets, in part, the stack size for server execution threads that execute requests for server connections.
- **-gt iqsrv16 database server option**
Sets the maximum number of physical processors that can be used (up to the licensed maximum). This option is only useful on multiprocessor systems.
- **-gtc iqsrv16 database server option**
Controls the maximum processor concurrency that the database server allows.
- **-qu iqsrv16 database server option**
Sets the privilege required for executing database file administration statements such as for creating or dropping databases.
- **-igfrec iqsrv16 Server Option**
Open database in forced recovery mode.
- **-iggovern iqsrv16 Server Option**
Sets the number of concurrent queries allowed by the server.

The **-iggovern** value places a ceiling on the maximum number of queries to execute at once. If more users than the **-iggovern** limit have submitted queries, new queries will be queued until one of the active queries is finished.

The optimal value for **-iggovern** depends on the nature of your queries, number of CPUs, and size of the Sybase IQ buffer cache. The default value is $2 * numCPU + 10$. With a large number of connected users, you may find that setting this option to $2 * numCPU + 4$ provides better throughput.
- **-iqlm iqsrv16 Server Option**
Specifies the maximum amount of memory in MB that SAP Sybase IQ can dynamically request from the operating system for temporary use.

- **-igmc iqsrv16 Server Option**
Specifies the main IQ store buffer cache size, in MB.
- **-igmpx_failover iqsrv16 Server Option**
Initiates multiplex coordinator failover to establish the designated failover Secondary node as the new coordinator.
- **-igmpx_ov iqsrv16 Server Option**
Performs multiplex configuration override for the current node.
- **-igmpx_reclaimwriterfreelist iqsrv16 Server Option**
This option applies only while restarting a coordinator node.
- **-igmpx_sn iqsrv16 Server Option**
Runs the current node in multiplex in single-node mode.
- **-igmsgnum iqsrv16 Server Option**
Specifies the number of archives of the old message log maintained by the server.
- **-igmsgsz iqsrv16 Server Option**
Limits the maximum size of the message log.
- **-igmt iqsrv16 Server Option**
Specifies the number of SAP Sybase IQ threads to create.
- **-ignotemp iqsrv16 Server Option**
Creates a temporary file in place of the defined temporary dbspace.
- **-ignumbercpus iqsrv16 Server Option**
Specifies the number of CPUs available to SAP Sybase IQ, overriding the physical number of CPUs, for resource planning purposes.
- **-igpartition iqsrv16 Server Option**
Sets the number of IQ main and temp buffer cache partitions.
- **-igrivmem start iq Server Option**
Specifies the amount of memory, in megabytes, available to the RLV store.
- **-igro iqsrv16 Server Option**
Runs the current node read-only.
- **-igstart iqsrv16 Server Option**
Provides startup diagnostics for dbspaces.
- **-igtq iqsrv16 Server Option**
Specifies IQ temporary store cache size, in MB.
- **-igtss iqsrv16 Server Option**
Specifies the stack size, in KB, for server execution threads running either in the background or as part of a thread team assisting the main server connection thread.
- **-iqwmem iqsrv16 Server Option**
Creates a pool of “wired” memory on HP and Sun UNIX systems.
- **-k iqsrv16 database server option**
Controls the collection of Performance Monitor statistics.
- **-kl iqsrv16 database server option**
Specifies the file name of the Kerberos GSS-API library (or shared object on Unix) and enables Kerberos authenticated connections to the database server.
- **-kr iqsrv16 database server option (deprecated)**
Specifies the realm of the Kerberos server principal and enables Kerberos authenticated connections to the database server.
- **-krb iqsrv16 database server option**
Enables Kerberos-authenticated connections to the database server.
- **-ks iqsrv16 database server option**
Disables the creation of shared memory that the Performance Monitor uses to collect counter values from the database server.
- **-ksc iqsrv16 database server option**
Specifies the maximum number of connections that the Performance Monitor can monitor.

- **-ksd iqsrv16 database server option**
Specifies the maximum number of databases that the Performance Monitor can monitor.
- **-m iqsrv16 database server option**
Truncates the transaction log when a checkpoint is done.
- **-n iqsrv16 database server option**
Sets the name of the database server.
- **-o iqsrv16 database server option**
Prints all database server messages to the database server message log file.
- **-oe iqsrv16 database server option**
Specifies a file name to log startup errors, fatal errors, and assertions.
- **-on iqsrv16 database server option**
Specifies a maximum size for the database server message log, after which the file is renamed with the extension .old and a new file is started.
- **-os iqsrv16 database server option**
Specifies a maximum size for the database server message log file, at which point the file is renamed.
- **-ot iqsrv16 database server option**
Truncates the database server message log file and appends output messages to it.
- **-p iqsrv16 database server option**
Sets the maximum size of communication packets.
- **-pc iqsrv16 database server option**
Compresses all connections except for same-computer connections.
- **-pt iqsrv16 database server option**
Increases or decreases the size limit at which packets are compressed.
- **-qi iqsrv16 database server option**
Controls whether database server system tray icon and database server messages window appear.
- **-qp iqsrv16 database server option**
Specifies that messages about performance do not appear in the database server messages window.
- **-qs iqsrv16 database server option**
Suppresses startup error windows.
- **-qw iqsrv16 database server option**
Specifies that the database server messages window does not appear.
- **-s iqsrv16 database server option**
Sets the user ID for Syslog messages.
- **-sb iqsrv16 database server option**
Specifies how the database server reacts to broadcasts.
- **-sf iqsrv16 database server option**
Controls whether users have access to features for databases running on the current database server. A secured feature can only be accessed by a user with appropriate privileges, while an unsecured feature can be accessed by all users.
- **-sk iqsrv16 database server option**
Specifies a system secure feature key that can be used to allow access to features that are secured for the database server.
- **-su iqsrv16 database server option**
Sets the password for the DBA user of the utility database (utility_db), or disable connections to the utility database.
- **-tdsl iqsrv16 database server option**
Sets the TDS login mode.
- **-ti iqsrv16 database server option**
Disconnects inactive connections.
- **-tl iqsrv16 database server option**
Sets the period at which to send liveness packets.

- **-tmf iqsrv16 database server option**
Forces transaction manager recovery for distributed transactions.
- **-tq iqsrv16 database server option**
Shuts down the server at a specified time.
- **-u iqsrv16 database server option**
Opens files using the operating system disk cache.
- **-ud iqsrv16 Server Option**
(UNIX servers) Causes the process to run as a daemon in the root directory. SAP recommends that you do not use this switch in IQ servers.
- **-uf iqsrv16 database server option**
Specifies the action that the database server takes when a fatal error or assertion failure occurs on a database server.
- **-ut iqsrv16 Server Option**
(UNIX servers) Causes the server to touch catalog store temporary files at intervals specified by min.
- **-v iqsrv16 Server Option**
Displays the database server version in a message box (Windows) or in a version string (UNIX / Linux).
- **-x iqsrv16 database server option**
Specifies server-side network communications protocols.
- **-xd iqsrv16 Server Option**
Prevents the database server from becoming the default database server.
- **-xs iqsrv16 database server option**
Specifies server-side web services communications protocols.
- **-z iqsrv16 database server option**
Displays diagnostic communication messages, and other messages, for troubleshooting purposes.
- **-ze iqsrv16 database server option**
Displays database server environment variables in the database server messages window.
- **-zl iqsrv16 database server option**
Turns on capturing of the most recently-prepared SQL statement for each connection to databases on the server.
- **-zn iqsrv16 database server option**
Specifies the number of request log file copies to retain.
- **-zo iqsrv16 database server option**
Redirects request logging information to a file separate from the regular log file.
- **-zoc iqsrv16 database server option**
Redirects web service client information to a file.
- **-zr iqsrv16 database server option**
Enables request logging of operations.
- **-zs iqsrv16 database server option**
Limits the size of the request log.

8.2 Display Database Options

A) Display Database Options in IQ DB

Use “sp_iqcheckoptions” to Display Your Database Options

The sp_iqcheckoptions procedure lists the current and default values for database options that have been CHANGED from the default:

- When sp_iqcheckoptions is run as DBA, it lists all options set on a permanent basis for all groups.
- When sp_iqcheckoptions is run as a user, it lists temporary options set for DBA and those temporary options set by the current user.
- All users see non-default server start-up options.
- Sample Output for sp_iqcheckoptions:

```
User_name Option_name Current_value Default_value Option_type
-----
'DBA' 'Query_Plan_As_HTML' 'On' 'Off' 'Permanent'
'DBA' 'Query_Plan_Text_Access' 'On' 'Off' 'Temporary'
'DBA' 'Query_Plan_Text_Access' 'On' 'Off' 'Permanent'
```

B) Display SET Options in IQ DB

Use “SET” command to Display Your Database Options

The **SET OPTION** statement is used to change options that affect the behavior of the database and its compatibility with Transact-SQL. Setting the value of an option can change the behavior for all users or an individual user, in either a temporary or permanent scope.

The classes of options are:

- General database options
- Transact-SQL compatibility database options

Specifying either a user ID or the **PUBLIC** user ID determines whether the option is set for an individual user, a user group represented by *userid*, or the **PUBLIC** user ID (the user group to which all users are a member). If no user group is specified, the option change is applied to the currently logged-on user ID that issued the **SET OPTION** statement.

For example, the following statement applies an option change to the **PUBLIC** user ID, a user group to which all users belong:

```
SET OPTION Public.login_mode = standard
```

Only users with DBA privileges have the authority to set an option for the **PUBLIC** user ID.

In Embedded SQL, only database options can be set temporarily.

Changing the value of an option for the **PUBLIC** user ID sets the value of the option for any user that has not set its own value. Option values cannot be set for an individual user ID unless there is already a **PUBLIC** user ID setting for that option.

Users cannot set the options of another user, unless they have DBA authority.

Users can use the **SET OPTION** statement to change the values for their own user IDs. Setting the value of an option for a user ID other than your own is permitted only if you have DBA authority.

If you use the **EXISTING** keyword, option values cannot be set for an individual user ID unless there is already a **PUBLIC** user ID setting for that option.

Adding the **TEMPORARY** keyword to the **SET OPTION** statement changes the duration that the change takes effect. Without the **TEMPORARY** keyword, an option change is permanent: it does not change until it is explicitly changed using **SET OPTION**.

When **SET TEMPORARY OPTION** is applied using an individual user ID, the new option value is in effect as long as that user is logged in to the database.

When **SET TEMPORARY OPTION** is used with the **PUBLIC** user ID, the change is in place for as long as the database is running. When the database is shut down, **TEMPORARY** options for the **PUBLIC** user ID revert back to their permanent value.

Temporarily setting an option for the **PUBLIC** user ID as opposed to setting the value of the option permanently offers a security advantage. For example, when the login_mode option is enabled, the database relies on the login security of the system on which it is running. Enabling the option temporarily means a database relying on the security of a Windows domain is not compromised if the database is shut down and copied to a local machine. In that case, the temporary enabling of login_mode reverts to its permanent value, which might be Standard, a mode in which integrated logins are not permitted.

If *option-value* is omitted, the specified option setting is deleted from the database. If it was a personal option setting, the value used reverts to the PUBLIC setting. If a **TEMPORARY** option is deleted, the option setting reverts to the permanent setting.

SQL> SET;

Option	Value
AES_Encrypt_Header_Format	-1
ASE_Function_Behavior	Off
Abort_On_Error_File	
Abort_On_Error_Line	0
Abort_On_Error_Number	0
Affinity_Autoexclude_Timeout	10
Aggregate_Index_Cutover	5000
Aggregation_Preference	0
Alloc_Rawdevice_Lastblock	Off
Allow_Snapshot_Versioning	Any
Append_Load	Off
Ase_Binary_Display	Off
Attention_Limit	0
BITMAP_Options1	1
BT_Prefetch_Max_Miss	1
BT_Prefetch_Size	10
BTree_Page_Split_Pad_Percent	50
Backup_Exec_Cmd	
Backup_Free_Space	8196
Bit_Vector_Pinnable_Cache_Percent	40
Bitmap_Percent_Factor	100
Blockmap_Prefetch_Size	10
Bloom_Max_Partitions	32

8.3 DBVALID - Database Administration Utility

The **dbvalid** utility is a validation utility that validates the indexes and keys on some or all of the SAP SQL Anywhere tables in the catalog store.

The Validation utility scans the entire table and looks up each record in every index and key defined on the table. By default, the Validation utility uses the express check option.

Note: The **dbvalid** utility lets you easily validate catalog store tables, but does not validate IQ main store tables. Use the **sp_iqcheckdb** stored procedure to validate IQ main store tables.

You can access the **dbvalid** utility at the system command-line level, which is useful for incorporating **dbvalid** into batch or command files.

Syntax

dbvalid [*options*] [*object-name*,...]

Usage

With the **dbvalid** command-line utility, you can validate the indexes and keys on some or all of the tables in the catalog store. **dbvalid** scans the entire table and confirms that each row exists in the appropriate indexes. It is the same as running the SQL Anywhere **VALIDATE TABLE** statement on each catalog store table.

Note: **VALIDATE TABLE** is not supported in SAP Sybase IQ. **sp_iqcheckdb** provides a similar function for IQ main store tables.

By default, the Validation utility uses the express check option. However, the express check option is not used if you specify **-f**, **-fd**, **-fi**, **-fn**, or **-i**.

If the catalog store table is inconsistent, **dbvalid** reports an error. If errors are reported, you can drop all of the indexes and keys on a table and re-create them. You must also re-create any foreign keys to the table.

Warning! Validate a table or entire catalog store only when no connections are making changes to the database; otherwise, spurious errors may be reported, indicating some form of database inconsistency even though no inconsistency actually exists.

Program exit code	Description
0	Database validated successfully
1	General failure in utility
2	Error validating database
7	Cannot find database to connect to (database name is wrong)
8	Cannot connect to database (user ID/password is wrong)
11	Cannot find server to connect to (server name is wrong)
12	Incorrect encryption key for starting database

Example

The following command validates the catalog store of the **iqdemo** database, connecting as user **DBA** with password **sql**:

```
dbvalid -c "uid=DBA;pwd=sql;dbf=c:\sybase\IQ-16_0\demo\iqdemo.db"
```

8.4 DB_BACKUPHEADER - Utility

Reads the first backup archive, returns backup statistics and definitions, displays the DBspaces and DBFiles that existed when the backup was done.

Syntax:

```
db_backupheader [ path ] backup_file
```

db_backupheader is a command line utility.

http://quickdbasupport.com/most_used_sybase_iq.php

8.5 Displays the source text “sp_helptext”

Displays the source text of a compiled object, as well as the text for user-defined functions, computed columns, or function-based index definitions.

```
sp_helptext objname[,grouping_num][, numlines[, printopts]]
```

Example:

Displays the source text of *pub_idrule*. Since this rule is in the *pubs2* database, execute this command from *pubs2*:

```
sp_helptext pub_idrule
# Lines of Text
-----
1

text
-----
create rule pub_idrule
as @pub_id in ("1389", "0736", "0877",
"1622", "1756")
or @pub_id like "99[0-9][0-9]"
```

Shared System Temporary Store

A multiplex configuration with shared temporary storage can use the `IQ_SHARED_TEMP` dbspace as a shared system temporary store instead of requiring a separate local store for each secondary server. The shared system temporary store simplifies multiplex configuration, improves performance, and supports distributed query processing.

On multiplex systems:

- When you set the logical server policy option `TEMP_DATA_IN_SHARED_TEMP ON`, SAP Sybase IQ creates all temporary objects on the `IQ_SHARED_TEMP` dbspace. You must restart secondary nodes after setting this option or after adding a read-write file to the shared temporary store. (If the shared temporary store contains no read-write file, or if you do not restart secondary nodes, data instead writes to `IQ_SYSTEM_TEMP`.)
- Temporary user objects (such as tables or table indexes) that you create using the **IN `IQ_SYSTEM_TEMP`** clause go in either `IQ_SYSTEM_TEMP` or `IQ_SHARED_TEMP`, depending on the value of the logical server option `TEMP_DATA_IN_SHARED_TEMP`:
 - If `TEMP_DATA_IN_SHARED_TEMP` is 'OFF', objects go in `IQ_SYSTEM_TEMP`.
 - If `TEMP_DATA_IN_SHARED_TEMP` is set 'ON', objects go in
- `IQ_SHARED_TEMP`.
- SAP Sybase IQ does not support creating temporary user objects using the **IN `IQ_SHARED_TEMP`** clause.
- The **WITH STOP SERVER** clause automatically shuts down all servers in the logical server. These statements support **WITH STOP SERVER**:
 - **ALTER LOGICAL SERVER**
 - **ALTER LS POLICY**
 - **CREATE LOGICAL SERVER**
 - **DROP LOGICAL SERVER**
 - If you use **ALTER LS POLICY ... WITH STOP SERVER** to change the `TEMP_DATA_IN_SHARED_TEMP` option 'ON|OFF', all servers in that logical server shut down automatically. You must restart the servers to force the logical server to place temporary data in the store specified by the `TEMP_DATA_IN_SHARED_TEMP` option.
- If you use **ALTER LS POLICY** to set `TEMP_DATA_IN_SHARED_TEMP` 'OFF', the logical server starts placing temporary data in the `SYSTEM` temporary area after the next normal server startup.
 - You can also change the `TEMP_DATA_IN_SHARED_TEMP` value indirectly using

CREATE LOGICAL SERVER, **ALTER LOGICAL SERVER**, or **DROP LOGICAL SERVER** statements and the **WITH STOP SERVER** clause

Reference Link

<http://infocenter.sybase.com/help/index.jsp?topic=/com.sybase.infocenter.dc36273.1550/html/sprocs/X25756.htm>

8.6 Enable and Disable Trace in IQ DB

Enable Trace in IQ DB

1. Check the table meta info

in dbisql:
sp_iqobjectinfo [owner],[table_name];

2. Enable SQL or Query Plan generator – On the load target IQ server – run these commands with DBA:
create a temp folder to save trace and logs:
mkdir /tmp/log_iqload

SQL Trace:

in dbisql:
call sa_server_option('request_level_logging', 'SQL');
call sa_server_option('request_level_log_file', '/tmp/log_iqload/sqltrace.log');

Query plan:

in dbisql:
set option query_plan='on';
set option query_detail='on';
set option query_plan_as_html = 'on';
set option dml_options10='on';
set option query_plan_after_run='on';
set option query_name = 'load_plan';
set option query_plan_text_caching='on';
set option query_plan_as_html_directory = '/tmp/log_iqload';
set option query_plan_text_access='on';
set option query_timing='on';
set option revert_to_v15_optimizer='OFF';

3. Run that load test, in the meantime – monitor the IO, CPU and thread status with NMON
nmon -f -s1 -c<seconds>

4. After load test completed, switch off the SQL trace or Query Plan generator with DBA:

SQL Trace:

in dbisql:
call sa_server_option('request_level_logging', 'OFF');

Query plan:

in dbisql:
set option query_plan='off';
set option query_detail='off';
set option query_plan_as_html = 'off';

5. Collecting all output and logs above:

Output:

sp_iqobjectinfo

Trace files

all files in folder /tmp/log_iqload

call sa_get_request_profile('/sys1/users/jones/iqreqs1_zr.log');
select * from satmp_request_profile;
select * from satmp_request_time;

Note: IQ has the option QUERY_PLAN_MIN_TIME to print query plan only when query execution time exceeds the threshold. We can use this option for now to get query plans for high execution time queries.

Documentation at:

<http://infocenter.sybase.com/help/index.jsp?topic=/com.sybase.infocenter.dc00801.1604/doc/html/jcu1332357637622.html>

Further IQ Trace Files and Log Files

<https://wiki.scn.sap.com/wiki/display/SYBIQ/IQ+Trace+Files+and+Log+Files>

8.7 SAP Sybase IQ Error Messages and Reporting Alerts

Error and status messages indicating conditions of potential concern to SAP Sybase IQ database operations can appear in several different IQ log files:

- IQ message file ("the .iqsmg log")
- Server log ("the .srvlog")
- Standard error log ("the .stderr log")
- Request Log ("the zrzo log" or "SQL log")

All four message sources should be monitored in order to catch all conditions of potential interest to a database administrator (DBA). There is no single means that a system generating DBA alerts can use to detect all error messages.

This article examines the various types of SAP Sybase IQ messages and how they can be detected ".iqmsg" log messages.

See, **Section 6.2.3 IQ Catalog DB and IQMSG file Info**

8.8 IQHEADER - Utility

Use the DBSpace Header utility to determine which server, if any, is using a particular device, file or LUN (Logical Unit Number) as a dbspace in order to analyze disk usage or to configure a multiplex query server.

The **iqheader** utility reports the configuration of an arbitrary device regardless of whether it is currently in use by an IQ server.

Usage

iqheader usage When invoked with no parameters, a usage summary is reported and a nonzero status is returned:

```
iqheader
```

```
Usage: iqheader [dbspace_path]
```

<http://infocenter.sybase.com/help/index.jsp?topic=/com.sybase.infocenter.dc00168.1510/html/iqutil/CIHJDHJHD.htm>

8.9 Utility “iqunload” to export / import IQ object(small tables)

Sample procedure for an object level backup in IQ:

- 1) We have table ‘LOAD9’ in test database suppose with 2 GB size / 2.5 crores of records.

```
(DBA)> select count(*) from LOAD9
(DBA)> sp_iqtablesize LOAD9
```

- 2) Take the backup of table ‘LOAD9’ with ‘iqunload’ utility. Output below:

```
-sh-4.1$ iqunload -c "dsn=XYZXX;" -t LOAD9 -r load9.sql /APP/ABC/DBA/
SAP IQ Unload Utility Version 16.0.0.2304
Connecting and initializing
2016-11-04 12:04:41 Unloading sequences
2016-11-04 12:04:41 Unloading table definitions
2016-11-04 12:04:47 Unloading index definitions
2016-11-04 12:04:51 Unloading triggers
2016-11-04 12:04:51 Extracting table: "DBA"."LOAD9"
Successfully unloaded schema and data from database "/APP/ABC/CATALOG/DB/ABC.db".
```

- 3) The following files are created. Data is extracted in to flat files DBA_LOAD9_DATA_1.inp & DBA_LOAD9_DATA_2.inp

```
-sh-4.1$ ls -l
-rw-r--r--. 1 iqABC dba      0 Nov  4 12:04 DBA_LOAD9_DATA_2.inp
-rw-r--r--. 1 iqABC dba 22876338961 Nov  4 12:07 DBA_LOAD9_DATA_1.inp
-rw-----. 1 iqABC dba   11764 Nov  4 12:07 load9.sql
```

- 4) Size of flat file is 22 GB.

```
-sh-4.1$ du -g
22G  DBA_LOAD9_DATA_1.inp
0    DBA_LOAD9_DATA_2.inp
12K  load9.sql
```

- 5) Loaded into another table ‘LOAD100’ to see if extracted data in flat file is valid. Data row count matches and data is valid.

```
-sh-4.1$ DBISQL @load100.sql
(DBA)> select count(*) from LOAD100
```

Reference documents:

Below are some documents shows support of “iqunload” on IQ16 SP08

[http://froeb.net/blog/wp-content/uploads/2015/04/IQ-16.0-SP8-Utility-Guide-SAP-Inc .pdf](http://froeb.net/blog/wp-content/uploads/2015/04/IQ-16.0-SP8-Utility-Guide-SAP-Inc.pdf)

Also, **SAP note 2156392** - How to restore backup to bigger devices - SAP IQ

“use iqunload -n from IQ15.x area to get schema from *running* the existing IQ server”

<https://archive.sap.com/documents/docs/DOC-70562>

8.10 Utility "TEMP_Extract" to export / import IQ object(Large tables)

The extract options let you redirect the output of a **SELECT** statement from the standard interface to go directly to one or more disk files or named pipes.

E.g:

```
set temporary option temp_extract_name1='X_1.dat';
set temporary option temp_extract_size1='1000000';
set temporary option temp_extract_name2='X_2.dat';
set temporary option temp_extract_size2='1000000';
set temporary option temp_extract_name3='X_3.dat';
set temporary option temp_extract_size3='1000000';
set temporary option temp_extract_name4='X_4.dat';
set temporary option temp_extract_size4='1000000';
set temporary option temp_extract_name5='X_5.dat';
set temporary option temp_extract_size5='1000000';
set temporary option temp_extract_name6='X_6.dat';
set temporary option temp_extract_size6='1000000';
set temporary option temp_extract_name7='X_7.dat';
set temporary option temp_extract_size7='1000000';
set temporary option temp_extract_name8='X_8.dat';
set temporary option temp_extract_size8='1000000';
set temporary option temp_extract_directory='/tmp/XYZ/';
set temporary option isql_show_multiple_result_sets='on' ;
set temporary OPTION ISQL_PRINT_RESULT_SET = 'ALL';
set temporary option temp_extract_binary = 'ON';
set temporary option temp_extract_quotes = 'OFF';
set temporary option temp_extract_quotes_all = 'OFF';
```

```
select * from <owner.tablename>;
```

The Extract Options:

Option Name	Allowed Values	Default value
Temp_Extract_Append	ON or OFF	OFF
Temp_Extract_Binary	ON or OFF	OFF
Temp_Extract_Column_Delimiter	string	' '
Temp_Extract_Directory	string	"
Temp_Extract_Name1	string	"
Temp_Extract_Name2	string	"
Temp_Extract_Name3	string	"
Temp_Extract_Name4	string	"
Temp_Extract_Name5	string	"
Temp_Extract_Name6	string	"
Temp_Extract_Name7	string	"
Temp_Extract_Name8	string	"
Temp_Extract_Null_As_Empty	ON or OFF	OFF
Temp_Extract_Null_As_Zero	ON or OFF	OFF
Temp_Extract_Quote	string	"
Temp_Extract_Quotes	ON or OFF	OFF

Option Name	Allowed Values	Default value
Temp_Extract_Quotes_All	ON or OFF	OFF
Temp_Extract_Row_Delimiter	string	"
Temp_Extract_Size1	platform specific*	0
Temp_Extract_Size2	platform specific*	0
Temp_Extract_Size3	platform specific*	0
Temp_Extract_Size4	platform specific*	0
Temp_Extract_Size5	platform specific*	0
Temp_Extract_Size6	platform specific*	0
Temp_Extract_Size7	platform specific*	0
Temp_Extract_Size8	platform specific*	0
Temp_Extract_Swap	ON or OFF	OFF

*The default values for the Temp_Extract_Size*n* options are platform specific:

- AIX and HP-UX: 0 – 64GB
- Sun Solaris: 0 – 512GB
- Windows: 0 – 128GB
- Linux: 0 – 512GB

When large file systems, such as JFS2, support file size larger than the default value, set TEMP_EXTRACT_SIZE*n* to the value that the file system allows. For example, to support 1TB set option:

```
SET OPTION TEMP_EXTRACT_SIZE1 = 1073741824 KB
```

Types of Extraction

There are three types of data extraction:

- Binary
- Binary/swap
- ASCII

A binary extraction produces a file that can be loaded via a **LOAD TABLE** statement with an overall "binary" format and with a per column "binary with null byte" format.

The binary/swap extraction is the same as the binary extraction, except it is designed to be loaded on another machine with opposite endianness.

The ASCII extraction produces a text file.

The two options Temp_Extract_Binary and Temp_Extract_Swap determine which of the three types of extraction is done:

Type	Temp_Extract_Binary	Temp_Extract_Swap
binary	ON	OFF
binary/swap	ON	ON
ASCII	OFF	OFF

Further reference document:

<http://infocenter.sybase.com/help/index.jsp?topic=/com.sybase.infocenter.dc01773.1603/doc/html/san1288042643642.html>

http://froebe.net/blog/wp-content/uploads/2013/09/IQ-16.0-Reference-Statements-and-Options-Sybase-Inc_.pdf

SAP Note 1984992 - How to backup and restore across different endian formats - SAP IQ

8.11 IQ Tuning GDirty

When you run "iq utilities main" summary report, GDirty shows the number of grabbed dirty pages from memory. According to the Sybase documentation **this value should ideally be 0**. The recommended tuning parameters are `sweeper_threads_percent` and `wash_area_buffers_percent`. Sample output of the summary report

Summary														
2007-07-17 16:16:30														
Active Users	Main Cache							Temp Cache						
	Finds	HR%	Reads/Writes	GDirty	Pin%	Dirty%	InUse%	Finds	HR%	Reads/Writes	GDirty	Pin%	Dirty%	InUse%
2	238914	98.1	40802/7169	4	0.1	1.9	100.0	488989	99.0	40878/9242	4	4.1	7.3	99.9
6	278497	98.1	48001/9672	0	0.1	12.6	100.0	560063	99.1	48001/11749	0	8.4	16.4	100.0
5	226453	97.7	28472/16156	0	0.1	1.5	100.0	588959	99.1	28472/19779	0	2.2	10.7	97.5
6	202383	98.6	33150/1967	0	0.2	2.0	100.0	474606	99.4	33231/5498	0	0.2	6.8	94.1
7	303314	98.7	33678/8680	137	0.3	7.0	100.0	669258	99.4	33678/10719	137	0.4	4.8	90.6
5	357002	99.4	71293/5826	396	0.5	7.0	100.0	495429	99.6	71293/9025	396	0.4	4.9	91.5
1	340929	99.1	67531/17842	1198	0.0	4.8	100.0	552891	99.5	67531/20993	1198	0.3	4.4	93.0
4	278524	98.1	52183/7119	2347	0.1	6.5	100.0	431158	98.8	52183/11021	2347	0.3	6.0	95.3
7	183120	96.3	32305/4261	652	0.1	11.6	100.0	414979	98.3	32532/9837	652	0.1	5.9	95.2
4	278263	98.6	34219/33269	0	0.2	8.0	100.0	626593	99.4	34219/35855	0	0.7	5.1	96.7
2	291010	99.0	34281/21889	0	0.0	23.4	100.0	652462	99.5	34281/25707	0	0.9	10.5	97.2
6	310845	97.6	39144/30112	0	0.2	11.3	100.0	659147	98.8	39499/33867	0	0.2	6.5	99.2
4	237452	95.2	46043/25674	226	0.6	5.3	100.0	5089134	99.8	46088/27897	226	0.3	2.4	98.2

As you can see, GDirty is above zero at some point. Multiple tests with various combinations of the `sweeper_threads_percent` and `wash_area_buffers_percent` have shown that changing `sweeper_threads_percent` does not make a big difference. When you need **to reduce Gdirty, it's best to increase the size of the wash area**. The default value is 20 and when you change it, do it with fairly big steps (e.g. + 10%). Do it with "set option public.wash_area_buffers_percent = <new value>" **Run tests before making final changes**. Also check the hit ratio below 90% Gdirty is issue, Increase cache can help resolve this issue too.

8.12 IQ Monitoring TOP SQL statement performance

The statement performance monitoring feature returns execution times for slow SQL statements (queries), and other relevant diagnostic data (like CPU usage, number of pages found in the cache, number of times the statement was executed in the current plan, and number of threads used by statement execution).

Note: This IQ feature is only available since IQ16 SP11 PI12 +

Procedure

1. Set option `COLLECT_IQ_PERFORMANCE_STATS` to ON.
2. Set option `QUERY_PLAN_MIN_TIME` in milliseconds. This sets the monitoring threshold, so that only those SQL statements with execution times exceeding this threshold are recorded.
3. Use the `sp_top_k_statements` and `sp_find_top_statements` system procedures to report the statement and plan combinations that take the longest time to run:
 - o `sp_top_k_statements` provides timing metrics including the standard deviation (`stddev_seconds`) from average statement execution, and the maximum runtime (`max_seconds`) for the statement.
 - o `sp_find_top_statements` provides resource metrics, including CPU usage (`max_cpu_usage_perc`), temp space usage (`temp_space_used_mb`), number of times the statement was executed by the current plan (`num_exec`), and number of threads used (`max_thread_count`).
4. Analyze statement performance data in the following system views:
 - o `GTSYSPERFCACHEMT` system view - Provides the SQL for slow statements.
 - o `GTSYSPERFCACHEPLAN` system view - Provides the XML plan for slow statements.
5. If a statement's standard deviation (`stddev_seconds`) in `sp_top_k_statements` indicates a slow statement, consider further investigation by turning on query plan generation. See *Generating a Query Plan* in the *SAP IQ Interactive SQL Guide*.

<https://help.sap.com/viewer/a8982cc084f21015a7b4b7fcdeb0953d/16.0.11.12/en-US/a50746e62c2248c2a66f34c8e34fb722.html>

8.13 Sybase IQ Sysmon - System Performance Analysis

IQ Utility

Sybase IQ's sysmon procedure produces a log file

```
declare local temporary table dummy_monitor_debug (dummy_column integer);
declare local temporary table dummy_monitor1_debug (dummy_column integer);
set temporary option Monitor_Output_Directory = "/qwer/jio/ingest/LOAD_STATISTICS_14092014";
iq utilities main into dummy_monitor_debug start monitor '-debug -interval 10 -file_suffix main';
iq utilities private into dummy_monitor1_debug start monitor '-debug -interval 10 -file_suffix temp';
```

OR

```
set option Monitor_Output_Directory = "/qwer/test/ingest/LOAD_STATISTICS_14092014"
go
sp_iqsysmon start_monitor, filemode, '-interval 120 -file_suffix sysmon.2017_May6'
go
commit
go
waitfor delay '00:59:00'
commit
go
sp_iqsysmon stop_monitor
go
```

Below is a handy script for processing the sysmon output. It filters the data, and shows recommended levels/benchmarks.

```
#!/bin/bash
#=====
# sysmon log file analyzer
#
#=====

fname=$1

if ! test -f $fname; then
    echo "Error: file $fname not found."
    exit
fi

date

echo "=====
echo "IQ Sysmon Log Analyzer"
echo "=====
sleep 2

echo "Threads: Free vs Reserved          Benchmark: ThrNumFree > ThrReserved"
echo " "; echo " "; sleep 2

egrep 'Thr' $fname | egrep 'Free|Reserved' | head -25

echo "====="; sleep 3
echo "Press enter to continue."
read sel1

echo "Pinned Buffers          Benchmark: Pinned < 90%"
echo " "; echo " "; sleep 2

egrep 'Pool|Pin' $fname | head -25

echo "====="; sleep 3
echo "Press enter to continue."
read sel1
```

```

echo "Buffers in Use %           Benchmark: ~= 100%"
echo " "; echo " "; sleep 2

egrep 'Pool|InUse' $fname | head -25

echo "====="; sleep 3
echo "Press enter to continue."
read sel1

echo "CPU Time                 Benchmark: CPU Sys < 20%"
echo " "; echo " "; sleep 2

grep 'CPU Sys' $fname | head -25

echo "====="; sleep 3
echo "Press enter to continue."
read sel1

echo "LRU Waits                 Benchmark: < 20%"
echo " "; echo " "; sleep 2

grep 'LRUNumTime' $fname | head -25

echo "====="; sleep 3
echo "Press enter to continue."
read sel1

cho "Buffer Busy Waits         Benchmark: ~= 0"
echo " "; echo " "; sleep 2

egrep 'Manager|BusyWaits' $fname | egrep -v 'Memory|Transaction|Thread|fetch' | head -25

echo "====="; sleep 3
echo "Press enter to continue."
read sel1

echo "Grabbed Dirty             Benchmark: ~=0"
echo " "; echo " "; sleep 2

egrep -i 'grabbeddirty' $fname | head -25

echo "====="; sleep 3
echo "Press enter to continue."
read sel1

echo "HR% - Cache Hit Rate       Benchmark: Hit% > 90%"
echo " "; echo " "; sleep 2

egrep -i 'hit%' $fname | head -25

echo "=====
```

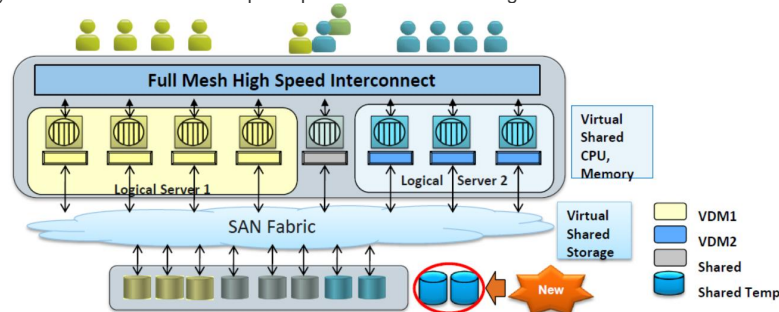
8.14 DQP (Distributed Query Processing)

Distributed Query Processing (DQP) spreads query processing across multiple servers in a SAP Sybase IQ Multiplex grid. DQP was introduced in IQ 15.4 and has been enhanced in terms of performance in IQ 16.0.

It improves performance in IQ multiplex configurations by spreading work across multiple nodes in the cluster.

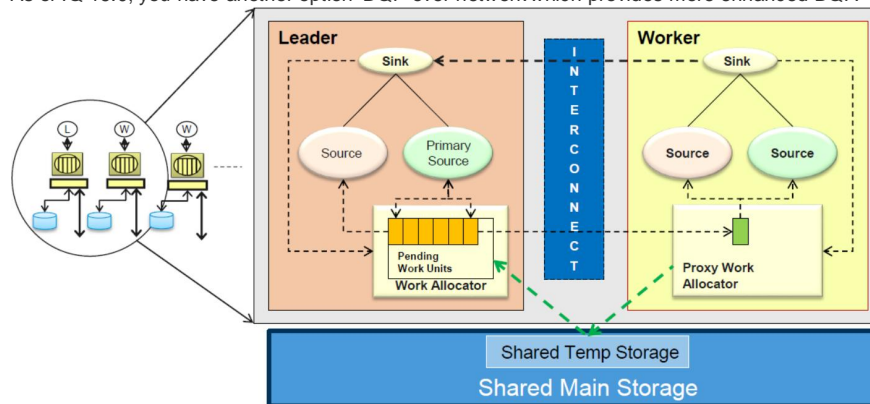
Logical server

- Grouping dynamically physical multiplex servers into a logical server.
- For distributed processing, you can dynamically change the members involved in the logical server.
- A physical member node can be participated in more than 2 logical servers.



DQP (Distributed Query Processing)

- Leader node receives a request for query, it distributes work units to worker nodes.
- Worker nodes returns the result set to the leader node.
- In order to save the intermediate results, you should add a particular dbspace named `IQ_SYSTEM_SHARED_TEMP` dbspace in IQ 15.4.
- Communications between nodes are done through MIPC (Multiplex Inter Process Communication).
- As of IQ 16.0, you have another option 'DQP over network' which provides more enhanced DQP.



What Kinds of Queries Can Be Distributed Across a PlexQ Grid

In order for a query operator to be distributed, it must be able to be executed in parallel. When an operator is executed in parallel, multiple threads can be applied to execute the processing in parallel. In SAP Sybase IQ, most query operators can be parallelized but not all are distributed.

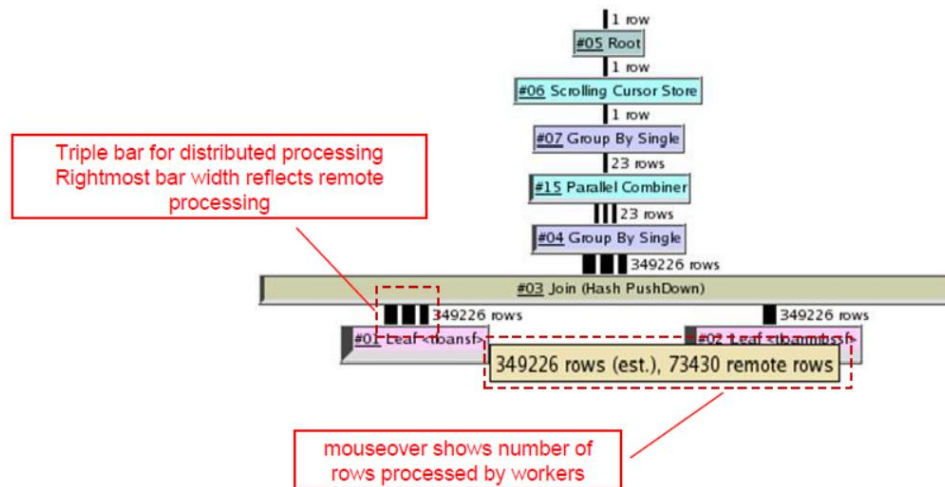
The following table shows which query operators are distributed

CLASS	OPERATOR
JOIN	Nested Loop / Nested Loop Pushdown Hash / Hash Pushdown Sort Merge / Sort Merge PushDown Asymmetric Sort Merge / Sort Merge PushDown Asymmetric Hash / Hash PushDown Partitioned Join algorithms
GROUP BY	GROUP BY SINGLE GROUP BY (HASH) GROUP BY (SORT) Partitioned GROUP BY algorithms
DISTINCT	DISTINCT (HASH) DISTINCT (SORT)
SORT	ORDER BY ORDER BY (N) SORTED IN
SUBQUERY	Uncorrelated
PREDICATES	Condition Execution (using FP / LF / HG indexes)
OLAP	OLAP RANK and WINDOW with PARTITION
SELECT component of INSERT operations	INSERT...SELECT INSERT...LOCATION

Query fragments that have the following behavior are never distributed:

- Ø Write to the database (including DDL, INSERT, LOAD, UPDATE and DELETE)
 - Ø Reference temporary tables
 - Ø Reference tables that reside in the SYSTEM DBSpace
 - Ø Reference proxy tables
 - Ø Utilize non-deterministic functions, such as NEWID
- Note that a LOAD operation can still be "distributed" by loading individual tables in parallel using multiple writer nodes in the grid

A sample query plan generated by DQP



DQP(Distributed Query Processing) - Error handling

1. If a leader thread runs into an unsolvable error while worker threads are working on work units, the worker thread rolls back its task.
2. Under a situation that leader threads are working on work units and there is an available node which can afford to take work units, if a worker thread encounters an unsolvable errors(ex, slowness / going down / hang / etc), then the leader node keeps sending the work units to the worker node(retry) or sending them to another worker node available.
3. If the worker node gets crashed while processing work units, then the leader send them out to another available worker node.
4. Sending out the work units to another worker node depends on a database option MPX_WORK_UNIT_TIMEOUT(default : 60 sec).

DQP(Distributed Query Processing) – “dqp_enabled” option

A database option DQP_ENABLED enables or disables the DQP behavior as a temporary or public option.

Also, it's possible to define the DQP behavior as a login policy option in IQ 15.4 as below.

```
"ALTER LOGIN POLICY lps1 dqp_enabled=ON LOGICAL SERVER ls1;"
```

As of IQ 16.0, it has been changed to a logical server policy option, instead of login policy option.

And, IQ 16.0 introduced a new option 'DQP OVER NETWORK' which can be using without having to write intermediate result to IQ_SYSTEM_SHARE_TEMP dbspace.

```
"ALTER LS POLICY lps1 dqp_enabled= 2;"
```

- 0 for No DQP,
- 1 for DQP over IQ_SYSTEM_SHARED_TEMP(Default),
- 2 for DQP over the wire without using IQ_SYSTEM_SHARED_TEMP

```
"sp_i qmpxcheckdqpconfig"
```

Related Documents

<http://infocenter.sybase.com/help/index.jsp?topic=/com.sybase.infocenter.help.iq.15.4/title.htm>

http://help.sap.com/saphelp_iq1610_iqmpx/helpdata/en/a2/30362b84f21015b0c4978dd1653301/content.htm?frameset=/en/a8/90ad7284f210158f85cf9374d47854/frameset.htm¤t_toc=/en/a8/90ad7284f210158f85cf9374d47854/plain.htm&node_id=116&show_children=false

Whitepaper on Scale-out with SAP IQ:

https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=4&ved=0ahUKEwj44q7R0bbPAhUX7WMKHw0PBBOQFgg3MAM&url=http%3A%2F%2Fwww.sdn.sap.com%2Ffir%2Fscn%2Findex%3Frid%3D%2Flibrary%2Fuid%2Fd0bd9b86-2c42-3110-baa2-a2c909de7cab%26overridelayout%3Dtrue&usq=AFQjCNF4NpD53nW6ZomqeSGRDS6gPCV_lw&bvm=bv.134495766,d.cGc&cad=rja

8.15 IQ Checkpoint

How the database server decides when to checkpoint

The priority of writing dirty pages to the disk increases as the time and the amount of work since the last checkpoint increases. The priority is determined by the following factors:

- **Checkpoint Urgency** The time that has elapsed since the last checkpoint, as a percentage of the checkpoint time setting of the database. You can set the maximum time, in minutes, between checkpoints by using the -gc server option or the checkpoint_time database option. If -gc is specified, the checkpoint_time option setting in the database is ignored.
- **Recovery Urgency** A heuristic to estimate the amount of time required to recover the database if it fails right now. You can set the maximum time, in minutes, for recovery in the event of system failure by using the -gr server option or recovery_time database option. If -gr is specified, the recovery_time option setting in the database is ignored.

The checkpoint and recovery urgency values are important only if the database server does not have enough idle time to write dirty pages. The lower boundary on the interval between checkpoints is based on a combination of the recovery_time and checkpoint_time options. The recovery_time option setting is not respected in cases where it would force a checkpoint too soon.

Frequent checkpoints make recovery quicker, but also create work for the server writing out dirty pages.

If, because of other activity in the database, the number of dirty pages falls to zero, and if the checkpoint urgency is 33% or more, then a checkpoint takes place automatically since it is a convenient time.

- *IQ will also automatically try and do a checkpoint if the database server processing remains idle long enough and checkpoint urgency (CheckpointUrgency) reaches 33% of -gc.*

Both the checkpoint urgency and recovery urgency values increase until the checkpoint occurs, at which point they drop to zero.

"If COOPERATIVE_COMMITS is set to OFF, a COMMIT is written to disk as soon as it is received by the database engine, and the application is then allowed to continue. When COOPERATIVE_COMMITS is set to ON (the default), the database engine does not immediately write the COMMIT to the disk. Instead, it requires the application to wait for a maximum length set by the COOPERATIVE_COMMIT_TIMEOUT option for something else to put on the pages before they are written to disk."

SQL> sa_db_properties () where PropName like Checkpoint or Chk.

O/P

Number	PropNum	PropName	PropDescription	Value
0	22	ChkptFlush	Checkpoint flushed pages	215196
0	23	ChkptPage	Checkpoint log page images saved	215172
0	24	CheckpointUrgency	Checkpoint Urgency	23
0	25	Chkpt	Checkpoints	8161
0	26	CheckpointLogCommitToDisk	Checkpoint log commit to disk	32844
0	27	CheckpointLogPagesInUse	Checkpoint log pages in use	61
0	28	CheckpointLogPagesRelocated	Checkpoint log pages relocated	131
0	29	CheckpointLogSavePreimage	Checkpoint log save preimage	215172
0	30	CheckpointLogSize	Checkpoint log size in pages	68
0	31	CheckpointLogPagesWritten	Checkpoint log pages written	215242
0	32	CheckpointLogWrites	Checkpoint log disk writes	16485
0	96	IdleCheck	Idle I/O checked	1060455
0	97	IdleChkTime	Idle I/O checkpoint time	1097556
0	98	IdleChkpt	Idle I/O checkpoints	7899
0	284	Checksum	Page checksum	On
0	437	LastCheckpointTime	Last checkpoint time	6/2/2017 17:49
0	439	WriteChecksum	Write I/O checksum	On

Checkpoint and recovery statistics

Statistic	Description
Checkpoint Flushes/sec	Shows the rate at which ranges of adjacent pages are written out during a checkpoint.
Checkpoint Urgency	Shows the checkpoint urgency, expressed as a percentage.
Checkpoints/sec	Shows the rate at which checkpoints are performed.
ChkptLog: Bitmap size	Shows the size of the checkpoint log bitmap.
ChkptLog: Commit to disk/sec	Shows the rate at which checkpoint log commit_to_disk operations are being performed.
ChkptLog: Log size	Shows the size of the checkpoint log in pages.
ChkptLog: Page images saved/sec	Shows the rate at which pages are being saved in the checkpoint log prior to modification.
ChkptLog: Pages in use	Shows the number of pages in the checkpoint log which are currently in use.
ChkptLog: Relocate pages/sec	Shows the rate at which pages in the checkpoint log are being relocated.
ChkptLog: Save preimage/sec	Shows the rate at which new database page preimages are being added to the checkpoint log.
ChkptLog: Write pages/sec	Shows the rate at which pages are being written to the checkpoint log.
ChkptLog: Writes/sec	Shows the rate at which disk writes are being performed in the checkpoint log. One write can include multiple pages.
ChkptLog: Writes to bitmap/sec	Shows the rate at which disk writes are being performed in the checkpoint log for bitmap pages.
Idle Actives/sec	Shows the rate at which the database server's idle thread becomes active to do idle writes, idle checkpoints, and so on.
Idle Checkpoint Time	Shows the total time spent doing idle checkpoints, in seconds.
Idle Checkpoints/sec	Shows the rate at which checkpoints are completed by the database server's idle thread. An idle checkpoint occurs whenever the idle thread writes out the last dirty page in the cache.
Idle Writes/sec	Shows the rate at which disk writes are issued by the database server's idle thread.
Recovery I/O Estimate	Shows the estimated number of I/O operations required to recover the database.
Recovery Urgency	Shows the recovery urgency expressed as a percentage.

Refer SAP notes below:

1937483 - Temporary hangs in Checkpoint - SAP IQ

2037009 - [SAP IQ] A relationship between ev_begintxn and checkpoint.

2478791 - SAP IQ How do server startup switches -gc and -gr affect auto checkpointing

Other Performance Monitor statistics

Statistic	Description
Active Requests	Active Requests is the number of engine threads that are currently handling a request.
Asynchronous Reads/sec	Asynchronous Reads/sec is the rate at which pages are being read asynchronously from disk.
Asynchronous Writes/sec	Asynchronous Writes/sec is the rate at which pages are being written asynchronously to disk.
Bytes Received/sec	Bytes Received/sec is the rate at which network data (in bytes) are being received.
Bytes Transmitted/sec	Bytes Transmitted/sec is the rate at which bytes are being transmitted over the network.
Cache Hits/sec	Cache Hits/sec is the rate at which database page lookups are satisfied by finding the page in the cache.
Cache Index Internal Reads/sec	Cache Index Internal Reads/sec is the rate at which index internal-node pages are being read from the cache.
Cache Index Leaf Reads/sec	Cache Index Leaf Reads/sec is the rate at which index leaf pages are being read from the cache.
Cache Reads/sec	Cache Reads/sec is the rate at which database pages are being looked up in the cache.
Cache Table Reads/sec	Cache Table Reads/sec is the rate at which table pages are being read from the cache.
Cache Writes/sec	Cache Writes/sec is the rate at which pages in the cache are being modified (in pages/sec).
Checkpoint Flushes/sec	Checkpoint Flushes/sec is the rate at which ranges of adjacent pages are being written out during a checkpoint.
Checkpoint Log/sec	Checkpoint Log/sec is the rate at which the transaction log is being checkpointed.
Checkpoint Urgency	Checkpoint Urgency is expressed as a percentage.
Checkpoints/sec	Checkpoints/sec is the rate at which checkpoints are being performed.
Commit files/sec	Commit files/sec is the rate at which the engine is forcing a flush of the disk cache. On Windows NT and NetWare platforms, the disk cache does not need to be flushed because unbuffered (direct) I/O is used.
Commits/sec	Commits/sec is the rate at which Commit requests are being handled.
Context Switch Checks/sec	Context Switch Checks/sec is the rate at which the current engine thread is volunteering to give up the CPU to another engine thread.
Context Switches/sec	Context Switches/sec is the rate at which the current engine thread is being changed.
Continue Requests/sec	Continue Requests/sec is the rate at which "CONTINUE" requests are being issued to the engine.
Corrupt Packets/sec	Corrupt Packets/sec is the rate at which corrupt network packets are being received.
Current IO	Current IO is the current number of file I/Os issued by the engine which have not yet completed.
Current Reads	Current Reads is the current number of file reads issued by the engine which have not yet completed.
Current Writes	Current Writes is the current number of file writes issued by the engine which have not yet completed.
Cursor	Cursor is the number of declared cursors that are currently being maintained by the engine.

Dirty Pages	Dirty Pages is the number of pages in the cache which must be written out and which do not belong to temporary files.
Disk Index Internal Reads/sec	Disk Index Internal Reads/sec is the rate at which index internal-node pages are being read from disk.
Disk Index Leaf Reads/sec	Disk Index Leaf Reads/sec is the rate at which index leaf pages are being read from disk.
Disk Reads/sec	Disk Reads/sec is the rate at which pages are being read from file.
Disk SyncReads/sec	Disk SyncReads/sec is the rate at which pages are being read synchronously from disk.
Disk SyncWrite Other/sec	Disk SyncWrite Other/sec is the rate at which pages are being written synchronously to disk for a reason not covered by other "Disk SyncWrites ____/sec" counters.
Disk SyncWrites Checkpoint/sec	Disk SyncWrites Checkpoint/sec is the rate at which pages are being written synchronously to disk for a checkpoint.
Disk SyncWrites Extend/sec	Disk SyncWrites Extend/sec is the rate at which pages are being written synchronously to disk while extending a database file.
Disk SyncWrites Free Current/sec	Disk SyncWrites Free Current/sec is the rate at which pages are being written synchronously to disk to free a page that cannot remain in the in-memory free list.
Disk SyncWrites Free Push/sec	Disk SyncWrites Free Push/sec is the rate at which pages are being written synchronously to disk to free a page that can remain in the in-memory free list.
Disk SyncWrites Log/sec	Disk SyncWrites Log/sec is the rate at which pages are being written synchronously to the transaction log.
Disk SyncWrites Rollback/sec	Disk SyncWrites Rollback/sec is the rate at which pages are being written synchronously to the rollback log.
Disk SyncWrites/sec	Disk SyncWrites/sec is the rate at which pages are being written synchronously to disk. It is the sum of all the other "Disk SyncWrites ____/sec" counters.
Disk Table Reads/sec	Disk Table Reads/sec is the rate at which table pages are being read from disk.
Disk Waitreads/sec	Disk Waitreads/sec is the rate at which the engine is waiting synchronously for the completion of a read IO operation which was originally issued as an asynchronous read. Waitreads often occur due to cache misses on systems that support asynchronous IO.
Disk Waitwrites/sec	Disk Waitwrites/sec is the rate at which the engine is waiting synchronously for the completion of a write IO operation which was originally issued as an asynchronous write.
Disk Writes/sec	Disk Writes/sec is the rate at which modified pages are being written to disk.
Dropped Packets/sec	Dropped Packets/sec is the rate at which network packets are being dropped due to lack of buffer space.
Extend Database/sec	Extend Database/sec is the rate (in pages/sec) at which the database file is being extended.
Extend Temporary File/sec	Extend Temporary File/sec is the rate (in pages/sec) at which temporary files are being extended.
Free Buffers	Number of free network buffers.
Freelist Write Current/sec	Freelist Write Current/sec is the rate at which pages that cannot remain in the in-memory free list are being freed.
Freelist Write Push/sec	Freelist Write Push/sec is the rate at which pages that can remain in the in-memory free list are being freed.
Full compares/sec	Full compares/sec is the rate at which comparisons beyond the hash value in an index must be performed.
IO to Recover	IO to Recover is the estimated number of IO operations required to recover the database.

Idle Active/sec	Idle Active/sec is the rate at which the engine's idle thread becomes active to do idle writes, idle checkpoints, etc.
Idle Checkpoints/sec	Idle Checkpoints/sec is the rate at which checkpoints are completed by the engine's idle thread. An idle checkpoint occurs whenever the idle thread writes out the last dirty page in the cache.
Idle Waits/sec	Idle Waits/sec is the number of times per second that the server goes idle waiting for IO completion or a new request.
Idle Writes/sec	Idle Writes/sec is the rate at which disk writes are being issued by the engine's idle thread.
Index Fills	Index Fills is the number of times a new temporary merge index is created.
Index Merges	Index Merges is the number of times a temp index has been merged into a main index
Index adds/sec	Index adds/sec is the rate at which entries are being added to indexes.
Index lookups/sec	Index lookups/sec is the rate at which entries are being looked up in indexes.
Lock Table Pages	Lock Table Pages is the number of pages used to store lock information.
Main Heap Pages	Main Heap Pages is the number of pages used for global engine data structures.
Map Pages	Map Pages is the number of map pages used for accessing the lock table, frequency table, and table layout.
Maximum IO	Maximum IO is the maximum value that "Current IO" has reached.
Maximum Reads	Maximum Reads is the maximum value that "Current Reads" has reached.
Maximum Writes	Maximum Writes is the maximum value that "Current Writes" has reached.
Multi-packets Received/sec	Multi-packets Received/sec is the rate at which multi-packet deliveries are being received.
Multi-packets Transmitted/sec	Multi-packets Transmitted/sec is the rate at which multi-packet deliveries are being transmitted.
Open cursors	Open cursors is the number of open cursors that are currently being maintained by the engine.
Packets Received/sec	Packets Received/sec is the rate at which network packets are being received.
Packets Transmitted/sec	Packets Transmitted/sec is the rate at which network packets are being transmitted.
Page Relocations/sec	Page Relocations/sec is the rate at which relocatable heap pages are being read from the temporary file.
Pending requests/sec	Pending requests/sec is the rate at which the engine is detecting the arrival of new requests.
Ping1/sec	Ping1/sec is the rate at which ping requests which go all the way down into the engine are serviced.
Ping2/sec	Ping2/sec is the rate at which ping requests which are turned around at the top of the protocol stack are serviced.
Procedure Pages	Procedure Pages is the number of relocatable heap pages used for procedures.
Read Hints Used/sec	Read Hints Used/sec is the rate at which page-read operations are being satisfied immediately from cache thanks to an earlier read hint.
Read Hints/sec	A read hint is an asynchronous read operation for a page that the server is likely to need soon. Read Hints/sec is the rate at which such read operations are being issued.
Recovery Urgency	Recovery Urgency is expressed as a percentage.
Redo Free Commits/sec	A "Redo Free Commit" occurs when a commit of the transaction (redo) log is requested but the log has already been written (so the commit was done for "free").

Redo Rewrites/sec	Redo Rewrites/sec is the rate at which pages that were previously written to the transaction log (but were not full) are being written to the transaction log again (but with more data added).
Redo Writes/sec	Redo Writes/sec is the rate at which pages are being written to the transaction (redo) log.
Relocatable Heap Pages	Relocatable Heap Pages is the number of pages used for relocatable heaps (cursors, statements, procedures, triggers, views, etc.).
Remoteput Wait/sec	Remoteput Wait/sec is the rate at which the communication link must wait because it does not have buffers available to send information. This statistic is collected for NetBIOS (both sessions and datagrams) and IPX protocols only.
Requests/sec	Requests/sec is the rate at which the engine is being entered to allow it to handle a new request or continue processing an existing request.
Rereads Queued/sec	A reread occurs when a read request for a page is received by the database IO subsystem while an asynchronous read IO operation has been posted to the operating system but has not completed. Rereads Queued/sec is the rate at which this condition is occurring.
Rereceived Packets/sec	Rereceived Packets/sec is the rate at which duplicate network packets are being received.
Retransmitted Packets/sec	Retransmitted Packets/sec is the rate at which network packets are being retransmitted.
Rollback Log Pages	Rollback Log Pages is the number of pages in the rollback log.
Rollback/sec	Rollback/sec is the rate at which Rollback requests are being handled.
Adaptive Server Anywhere	The Adaptive Server Anywhere object provides information about the database server.
Sends Failed/sec	Sends Failed/sec is the rate at which the underlying protocol(s) failed to send a packet.
Statement	Statement is the number of prepared statements that are currently being maintained by the engine.
TotalBuffers	TotalBuffers number of network buffers.
Trigger Pages	Trigger Pages is the number of relocatable heap pages used for triggers.
Unscheduled requests	Unscheduled requests is the number of requests that are currently queued up waiting for an available engine thread.
View Pages	View Pages is the number of relocatable heap pages used for views.
Voluntary blocks/sec	Voluntary blocks/sec is the rate at which engine threads voluntarily block on pending disk IO.
Waitread Full Compare/sec	Waitread Full Compare/sec is the rate at which read requests associated with a full comparison (a comparison beyond the hash value in an index) must be satisfied by a synchronous read operation.
Waitread Optimizer/sec	Waitread Optimizer/sec is the rate at which read requests posted by the optimizer must be satisfied by a synchronous read operation.
Waitread Other/sec	Waitread Other/sec is the rate at which read requests from other sources must be satisfied by a synchronous read operation.
Waitread SysConnection/sec	Waitread SysConnection/sec is the rate at which read requests posted from the system connection must be satisfied by a synchronous read operation. The system connection is a special connection that is used as the context before a connection is made and for operations performed outside of a client connection.
Waitread Temporary Table/sec	Waitread Temporary Table/sec is the rate at which read requests for a temporary table must be satisfied by a synchronous read operation.

8.16 IQ Versioning

How Sybase IQ Tracks Versions

Sybase IQ assigns a version identifier to each database object that exists in the metadata, and that has a life span beyond a single command. IQ uses these version identifiers to ensure that writes to any database object are always based on the latest version of the object. It keeps each active version of a database object on disk.

When an older version is no longer needed by active transactions, Sybase IQ removes it from the cache.

A version is needed until the transactions using it do one of the following:

- Commit
- Roll back
- Issue a RELEASE SAVEPOINT command releasing that version

IQ 16 has two types of snapshot versioning, table-level and row-level. The default is table-level and provides the version based on the entire table. Row-level snapshot versioning applies only to tables enabled for in-memory RLV storage. In row-level snapshot versioning, multiple writers are allowed to make concurrent DML changes to table, but never to the same row at the same time.

sp_iqtransaction is a system stored procedure which supplies information on the transactions currently running on your server. The information returned by this command will help determine the status of your server. The rows are ordered by Transaction ID. In this document we will not cover every column of the output, but rather we will focus on the **State** output.

Different States of a Transaction

As mentioned in the above section sp_iqtransaction is used to get the information on the state of transactions. This variable reflects internal SAP Sybase IQ implementation details and is subject to change in the future.

- Active
indicates that the transaction is currently running
- Committing
indicates that the transaction is in the process of being completed.
- Committed
indicates that the transaction is completed and is waiting to be Applied.
- Rolling_back
A process has been killed and is in the process of cancelling the transaction.
- Rolled_back
A process has been killed and the process of cancelling the transaction has been completed.
- Applied
Once a transaction is applied, it is visible to any transaction and is subject to garbage collection. The purpose of the garbage collection is to release resources no longer in use.
- None
A connection is made, but nothing is running. This can be a new connection, which has not started any work, or it could be a committed transaction, which has been dropped, but is still holding the versioning.

Snapshot Isolation

Snapshot isolation is intended to eliminate the need for read locks by ensuring that each transaction sees a consistent view of the database. The obvious advantage is that a consistent view of the database can be queried without relying on fully serializable transactions (isolation level 3), and the loss of concurrency that comes with using isolation level 3. However, snapshot isolation comes with a significant cost because copies of modified rows must be maintained to satisfy the requirements of both concurrent snapshot transactions already executing, and snapshot transactions that have yet to start. Because of this copy maintenance, the use of snapshot isolation may be inappropriate for heavy-update workloads.

Cursor sensitivity, however, determines which changes are visible (or not) to the cursor's result. Because cursor sensitivity is specified on a cursor basis, cursor sensitivity applies to both the effects of other transactions and to update activity of the same transaction, although these effects depend entirely on the cursor type specified. By setting cursor sensitivity, you are not directly determining when locks are placed on rows in the database. However, it is the combination of cursor sensitivity and isolation level that controls the various concurrency scenarios that are possible with a particular application

More details please refer below link:

<https://wiki.scn.sap.com/wiki/display/SYBIQ/SAP+IQ+Snapshot+Versioning+Explained>

When this happens, please Check the following information:

- sp_iqcontext
- sp_iqconnection
- sp_iqtransaction
- sp_iqstatus
- sp_iqversionuse
- IQ cfg file
- pstack - need 3 pstack outputs at 1 minute intervals

8.17 IQ Index Advisor

sp_iqindexadvice Procedure

Displays stored index advice messages. Optionally clears advice storage.

SQL> select * from sa_conn_options() where OptionName like '%Index_Adv%' and number=connection_property('Number')

Number	PropNum	OptionName	OptionDescription	Value
1,065	884	Index_Advisor	(Description not available)	Off
1,065	885	Index_Advisor_Max_Rows	(Description not available)	2000

Enable Index Advisor in IQ DB

Option1:

1. SET OPTION index_advisor = 'ON';
2. SET OPTION index_advisor_max_rows = 100;
3. commit;
4. <query to be analyzed>;
5. call sp_iqindexadvice ();

Option2:

1. set temporary option INDEX_ADVISOR = on;
2. set temporary option INDEX_ADVISOR_MAX_ROWS = 20;
3. commit;
4. -- sql statements
5. call sp_iqindexadvice ();

The above code does two things for you-

1. It tells you that your option are set correctly.
2. If table structure is not optimal relative to query, the advisor should give some advice.

Syntax

sp_iqindexadvice ([resetflag])

Usage

Parameter	Description
resetflag	Lets the caller clear the index advice storage. If <i>resetflag</i> is nonzero, all advice is removed after the last row has been retrieved.

Description

Allows users to query aggregated index advisor messages using SQL. Information can be used to help decide which indexes or schema changes will affect the most queries.

INDEX_ADVISOR columns:

sp_iqindexadvice columns	
Column name	Description
Advice	Unique advice message
NInst	Number of instances of message
LastDT	Last date/time advice was generated

Example

Sample output from the **sp_iqindexadvice** procedure:

Advice	NInst	LastDT
Add a CMP index on DBA.tb (c2, c3) Predicate: (tb.c2 = tb.c3)	2073	2009-04-07 16:37:31.000
Convert HG index on DBA.tb.c4 to a unique HG	812	2009-04-06 10:01:15.000
Join Key Columns DBA.ta.c1 and DBA.tb.c1 have mismatched data types	911	2009-02-25 20:59:01.000

```
select index_type, index_name from sp_iqindex('JYNC1.ZAR004_TRF', 'GPART');
select * from sp_iqindexmetadata('<INDEX_NAME>', 'JYNC1.ZAR004_TRF');
sp_iqindexadvice
sp_iqindexuse
```


8.18 Database Options That Govern User Resources

Sybase IQ provides a set of database options that the DBA can use to control resources. These options are called *resource governors*.

How to Set Options

You can set database options using the **SET OPTION** statement. For syntax, see *Reference: Statements and Options*.

Resources That Can Be Managed

The following database options can be used to manage resources.

- **CURSOR_WINDOW_ROWS** – Defines the number of cursor rows to buffer.
- **MAX_CARTESIAN_RESULT** – Limits the number of result rows from a query containing a Cartesian join.
- **MAX_IQ_THREADS_PER_CONNECTION** – Sets the number of processing threads available to a connection for use in IQ operations.
- **TEMP_CACHE_MEMORY_MB** – Sets the size of the cache for the IQ Temporary Store. (The server option **-iqtc** is the recommended way to set the temp cache size.)
- **QUERY_TEMP_SPACE_LIMIT** – Limits the amount of temporary dbspace available to any one query.
- **QUERY_ROWS_RETURNED_LIMIT** – Tells the query optimizer to reject queries that might consume too many resources. If the optimizer estimates that the result set from the query will exceed the value of this option, the optimizer rejects the query and returns an error message.

The following database options affect the engine, but have limited impact on Sybase IQ:

- **JAVA_HEAP_SIZE** – Sets the maximum size (in bytes) of that part of the memory that is allocated to Java applications on a per connection basis.
- **MAX_CURSOR_COUNT** – Limits the number of cursors for a connection.
- **MAX_STATEMENT_COUNT** – Limits the number of prepared statements for a connection.

sp_iqshowpsex procedure

Function

Displays information about the settings of database options that control the priority of tasks and resource usage for connections.

Syntax

`sp_iqshowpsex [connection-id]`

8.19 *sp_iqmpxdumpltvlog* procedure

Returns the contents of the table version log in a readable format.

Description

sp_iqmpxdumpltvlog returns the contents of the queue through which the coordinator propagates DML and DDL commands to secondary nodes.

The **asc** or **desc** arguments specify the row order. These arguments require the **main** argument. The default options are: 'main', 'asc'.

Examples

This example shows the output of **sp_iqmpxdumpltvlog**:

RowID	Contents
1	Txn CatId:196 CmtId:196 TxnId:195 Last Rec:1 UpdateTime: 2011-08-08 15:41:43.621
2	Txn CatId:243 CmtId:243 TxnId:242 Last Rec:5 UpdateTime: 2011-08-08 15:42:25.070
3	DDL: Type=34, CatID=0, IdxID=0, Object=IQ_SYSTEM_TEMP, Owner=mpx4022_w1
4	CONN: CatID=0, ConnUser=
5	SQL: ALTER DBSPACE "IQ_SYSTEM_TEMP" ADD FILE "w1_temp1" '/dev/raw/raw25' FILE ID 16391 PREFIX 65536 FINISH 0 FIRST BLOCK
1	BLOCK COUNT 3276792 RESERVE 0 MULTIPLEX SERVER "mpx4022_w1" COMMITID 242 CREATETIME '2011-08-08 15:42:24.86

8.20 IQ Stops Processing or Stops Responding

You can detect the cause of server unresponsiveness by looking in the SAP Sybase IQ message file.

Possible Causes

The most common causes of server unresponsiveness include:

- Insufficient disk space
- Insufficient room in main or temp buffer cache,
- Insufficient IQ main store or IQ temporary store
- Check both the SAP Sybase IQ message file and the server log file
- Check near the end of the SAP Sybase IQ message file for the message `Resource count 0`, which may be followed by an `Open Cursor` message. These messages indicate a resource depletion, which can cause a deadlock

If the CPU usage changes, then the SAP Sybase IQ server process should be processing normally. Use Interactive SQL on a new or existing connection to gather the following information, in the specified order

Command	Informational Purpose
CHECKPOINT	Checkpoint can succeed
sa_conn_properties	Connection information
sa_conn_info	Connection information
sa_db_properties	Database property information
sa_eng_properties	Server property information
sp_iqstatus	Database status information
sp_iqconnection	Connection information
sp_iqtransaction	Transaction information

Further mode, use the **start_iq** command line option **-z** and the SAP Sybase IQ database option `QUERY_PLAN = 'ON'` to log useful information in the SAP Sybase IQ message (`.iqmsg`) and server log (`.srvlog`) files.

If you can connect to the database, run the **IQ UTILITIES** buffer cache monitor on the main and temp (private) buffer caches for ten minutes with a ten-second interval:

1. Connect to the database or use the existing connection.
2. `CREATE TABLE dummy_monitor(c1 INT);`
3. `IQ UTILITIES MAIN INTO dummy_monitor START MONITOR '-append -debug -interval 10 -file_suffix iqdbgmon';`
4. `IQ UTILITIES PRIVATE INTO dummy_monitor START MONITOR '-append -debug -interval 10 -file_suffix iqdbgmon';`

Let the process run for 10 minutes, then stop the buffer cache monitor:

5. `IQ UTILITIES MAIN INTO dummy_monitor STOP MONITOR;`
6. `IQ UTILITIES PRIVATE INTO dummy_monitor STOP MONITOR;`

For more details refer below link:

<http://infocenter.sybase.com/help/index.jsp?topic=/com.sybase.infocenter.dc01771.1604/doc/html/san1288043134267.html>

8.21 IQ Diagnostics and Hang Analysis

IQ Diagnostics and Analysis for Hung Server

1) Symptoms

Some of the symptoms, that could lead you (or users) to think that IQ server is hung are :

- No new connections can be made to the server either from the same host machine or different host machine over TCP/IP network.
- No tasks seems to be working and there is no new messages seen in the IQ server log (.iqmsg file), if no existing connections doing work.
- The messages appear to be sparse in .iqmsg file, no task how-ever simple, does appear to get completed in a timely manner.
- Catalog .db and .log time not getting updated on any IQ nodes.
- Hardware bottleneck – IO stuck

2) IQ Diagnostics checklist

Collect and analyze the following diagnostic information for all IQ problems and/or symptoms

- Know clear problem description and/or exact error message.
- Has anything changed recently on IQ or the OS?
- It is useful to know details like timing of the problem/symptom, duration of the symptom, whether there are any recent changes in the environment.

3) DIAGNOSTICS DATA NEEDED TO ANALYZE THE SYMPTOMS

- Analyze the IQ log files - **IQMSG.log, IQSRV.log, STDERR.log**
- Analyze the Operating System (OS) information: version, patch level, Total memory , and number of CPUs/cores - **DSTAT o/p, NMON o/p**
- Analyze the OS error logs - **/var/log/messages** from affected node
- Know if any other tool involved in the problem
- Get Minimum **3 pstack/procstack** taken for IQ server PID, 2 to 3 minute apart
- From Coordinator check:
 - sp_iqmpxinfo
 - sp_iqcontext
 - sp_iqconnection
 - sp_iqtransaction
 - sp_iqstatus
 - sp_iqversionuse
 - copy of the IQ cfg file

8.22 Nbit FP

The IQ UNIQUE column constraint determines whether a column loads as Flat FP or NBit FP. An IQ UNIQUE n value set to 0 loads the column as Flat FP. An n value greater than 0 but less than the FP_NBIT_AUTOSIZE_LIMIT creates a NBit column initially sized to n. Columns without an IQ UNIQUE constraint implicitly load as NBit up to the auto-size limit.

Using IQ UNIQUE with an n value less than the auto-size limit is not necessary. The load engine automatically sizes all low or medium cardinality columns as NBit. Use IQ UNIQUE in cases where you want to load the column as Flat FP or when you want to load a column as NBit when the number of distinct values exceeds the auto-size limits.

IQ UNIQUE defines the expected cardinality of a column and determines whether the column loads as Flat FP or NBit. An IQ UNIQUE(n) value explicitly set to 0 loads the column as Flat FP. Columns without an IQ UNIQUE constraint implicitly load as NBit up to the limits defined by the FP_NBIT_AUTOSIZE_LIMIT and FP_NBIT_LOOKUP_MB options:

- FP_NBIT_AUTOSIZE_LIMIT limits the number of distinct values that load as NBit
- FP_NBIT_LOOKUP_MB sets a threshold for the total NBit dictionary size
- FP_NBIT_ROLLOVER_MAX_MB sets the dictionary size for implicit NBit rollovers from NBit to Flat FP
- FP_NBIT_ENFORCE_LIMITS enforces NBit dictionary sizing limits. This option is OFF by default

Using IQ UNIQUE with an n value less than the FP_NBIT_AUTOSIZE_LIMIT is not necessary. Auto-size functionality automatically sizes all low or medium cardinality columns as NBit. Use IQ UNIQUE in cases where you want to load the column as Flat FP or when you want to load a column as NBit when the number of distinct values exceeds the FP_NBIT_AUTOSIZE_LIMIT.

Further, refer below Wiki link:

<https://wiki.scn.sap.com/wiki/pages/viewpage.action?pageId=441454309>

and

SAP Note 2397157 - How to identify the FP index is a nbit or flat FP index

8.23 PSTACK

This section help how to take pstack and analyse the threads in first glance.

\$pstack <OS PID of iqsrv16> > pstack.out1 // Take pstack dump

\$/stack_grp.awk pstack.out1 >pstack.1.grp // Analayze pstack o/p file

cat "stack_grp.awk"

```
#!/usr/bin/gawk -f

BEGIN {
    nframes = 0
    threadnum = 0
    tnum = 0
}

function finishthread()
{
    found = 0
    nthframes = nframes-FIRSTFRAME[threadnum]
    for(tnum in STKSIZES)
    {
        if(STKSIZES[tnum] != nthframes)
            continue
        tframe = FIRSTFRAME[threadnum]
        mframe = FIRSTFRAME[tnum]
        while(tframe < nframes)
            if(FRAMES[mframe++] != FRAMES[tframe++])
                break
        if(tframe == nframes)
        {
            nframes = FIRSTFRAME[threadnum]
            THREADLIST[tnum]=THREADLIST[tnum]" , "threadnum
            return
        }
    }
    if(nframes)
    {
        STKSIZES[threadnum] = nthframes
        THREADLIST[threadnum]=threadnum
    }
}

function newthread(newthreadnum)
{
    ++nthreads
    finishthread()
    threadnum = newthreadnum
    FIRSTFRAME[threadnum] = nframes
}

/^Thread / {
    newthread($2)
    next
}

/ tid# / {
    newthread($3)
    next
}

/Thread Number/ {
    newthread($4)
    next
}

/lwp# [1-9][0-9]* \ V thread#/ {
    newthread($6)
    next
}

/ lwp# [1-9][0-9]* / {
    newthread($3)
    next
}

/thread#/ {
    newthread($3)
    next
}

/Dump of thread/ {
    newthread($5)
    next
}

/^ \[[0-9][0-9]*\] \^=>\[[0-9][0-9]*\] / {
    tmp1 = substr($0, index($0, " ") + 2)
    FRAMES[nframes++] = substr(tmp1, 1, index(tmp1, "(") - 1)
}

/^#{
    if(!index($0,"from /usr"))
        FRAMES[nframes++] = substr($0, 1, index($0, " ()") - 1)
```

```
}

/^([ ]*[0-9])/{
  if(!index($0,"from /usr"))
    FRAMES[nframes++] = substr($0, 1, index($0, "[") - 1)
}

/^pc/{
  if(!index($0,"from /usr"))
  {
    pindex = index($0, "(")
    # print (pindex ? substr($0, 1, pindex - 1) : $0)
    FRAMES[nframes++] = (pindex ? substr($0, 1, pindex - 1) : $0)
  }
}

/^ff|^0x/{
  if(!index($0, " lwp_") &&
    !index($0, " _lwp_") &&
    !index($0, " cond_") &&
    !index($0, " _cond_") &&
    !index($0, " pthread_") &&
    !index($0, " slow_lock ") &&
    !index($0, " poll ") &&
    !index($0, " nanosleep ") &&
    !index($0, " read ") &&
    !index($0, " accept "))
    FRAMES[nframes++] = substr($0, 1, index($0, "(") - 1)
  if($2 == "__1cSst_threadInterfaceNIQdWaitForFunc6M_v_" || $2 == "__1cSst_threadInterfacePAddEntryAndWait6MipvpF11_i1L_v_")
  {
    CPTR = substr($3, 2, length($3)-2)
    if(CPTR != "1")
    {
      if(CPTR in CPTRS)
        CPTRS[CPTR] = CPTRS[CPTR] | "threadnum
      else
        CPTRS[CPTR] = threadnum
    }
  }
}

END {
  finishthread()
  for(tnum in THREADLIST)
  {
    print ""
    print "Threads ("split(THREADLIST[tnum], dummyp, ",")": "THREADLIST[tnum]
    framebegin = FIRSTFRAME[tnum]
    frameend = FIRSTFRAME[tnum] + STKSIZES[tnum]
    for(i = framebegin; i < frameend; ++i)
      print FRAMES[i]
  }
  print ""
  print "Thread Map:"
  print "SA    |IQ          |ADDR"
  print "-----+-----"
  for(CPTR in CPTRS)
    print CPTRS[CPTR] | "CPTR
}
```

8.24 DSTAT

Dstat is a versatile replacement for vmstat, iostat, netstat and ifstat. Dstat overcomes some of their limitations and adds some extra features, more counters and flexibility. Dstat is handy for monitoring systems during performance tuning tests, benchmarks or troubleshooting.

Dstat allows you to view all of your system resources in real-time, you can eg. compare disk utilization in combination with interrupts from your IDE controller, or compare the network bandwidth numbers directly with the disk throughput (in the same interval).

Features

- Combines vmstat, iostat, ifstat, netstat information and more
- Shows stats in exactly the same timeframe
- Enable/order counters as they make most sense during analysis/troubleshooting
- Modular design
- Written in python so easily extendable for the task at hand
- Easy to extend, add your own counters (please contribute those)
- Includes many external plugins to show how easy it is to add counters
- Can summarize grouped block/network devices and give total numbers
- Can show interrupts per device
- Very accurate timeframes, no timeshifts when system is stressed
- Shows exact units and limits conversion mistakes
- Indicate different units with different colors
- Show intermediate results when delay > 1

dstat --help

Usage: dstat [-afv] [options..] [delay [count]]

Versatile tool for generating system resource statistics

Dstat options:

-c, --cpu	enable cpu stats
-C 0,3,total	include cpu0, cpu3 and total
-d, --disk	enable disk stats
-D total,hda	include hda and total
-g, --page	enable page stats
-i, --int	enable interrupt stats
-I 5,eth2	include int5 and interrupt used by eth2
-l, --load	enable load stats
-m, --mem	enable memory stats
-n, --net	enable network stats
-N eth1,total	include eth1 and total
-p, --proc	enable process stats
-r, --io	enable io stats (I/O requests completed)
-s, --swap	enable swap stats
-S swap1,total	include swap1 and total
-t, --time	enable time/date output
-T, --epoch	enable time counter (seconds since epoch)
-y, --sys	enable system stats
--aio	enable aio stats
--fs, --filesystem	enable fs stats
--ipc	enable ipc stats
--lock	enable lock stats
--raw	enable raw stats
--socket	enable socket stats
--tcp	enable tcp stats
--udp	enable udp stats
--unix	enable unix stats
--vm	enable vm stats
--plugin-name	enable plugins by plugin name (see manual)
--list	list all available plugins
-a, --all	equals -cdngy (default)
-f, --full	automatically expand -C, -D, -I, -N and -S lists
-v, --vmstat	equals -pmgdsc -D total
--float	force float values on screen
--integer	force integer values on screen

```
--bw, --blackonwhite  change colors for white background terminal
--nocolor             disable colors (implies --noupdate)
--noheaders           disable repetitive headers
--noupdate            disable intermediate updates
--output file         write CSV output to file
```

delay is the delay in seconds between each update (default: 1)
count is the number of updates to display before exiting (default: unlimited)

SAMPLE output:

```
dstat
----total-cpu-usage---- -dsk/total- -net/total- ---paging-- ---system--
usr  sys  idl  wai  hiq  siq  read  writ  recv  send  in  out  int  csw
5    0   93   0   0   0  154k  84k   0    0   0   0  1081 1116
13   0   87   0   0   0   0    0   0    0   0   0  1036 696
8    0   92   0   1   0   0   8192B  0    0   0   0  1073 936
0    0   99   0   0   1   0    0   0    0   0   0  1072 940
1    1   97   0   2   0   0    0   0    0   0   0  1252 1727
1    1   98   0   1   0   0    0   0    0   0   0  1126 1191
1    0   99   0   0   0   0    0   0    0   0   0  1045 908
0    0   99   0   0   0   0   44k   0    0   0   0  1051 904
1    1   99   0   0   0   0    0   0    0   0   0  1036 850
1    0  100   0   0   0   0    0   0    0   0   0  1029 757
```

8.25 OS IO Monitoring

Command:

```
topas/top
iostat 2 10
ps -ealf | grep <>
vmstat 2 100
pstack IQ_SERVER_PID > pstack.out
mmfsadm dump iohist > /tmp/iohist.dmp.1
dstat 1
strace -f -p <pid of IQ> > strace.out 2>strace1.err
strace -f -r -T -tt -s 1024 -o strace_OUTPUT.out -p IQ_SERVER_PID
                                     <===== replace this with actual PID

mmdiag --iohist
mmdiag --help
mmdiag --waiter
```

QWER performance Guide:

http://files.qwerug.org/presentations/2014/UG10_QWER_Performance_Session_v10.pdf

8.26 SAP IQ Reference Guide

<http://help.sap.com/iq1611?current=iq16>

Refer **SAP Note 1843189** - SAP Sybase IQ Troubleshooting and diagnostics collection checklist

8.27 IQ Stored procedures

<ul style="list-style-type: none"> sa_audit_string sa_checkpoint_execute sa_disable_auditing_type sa_disk_free_space sa_enable_auditing_type sa_external_library_unload sa_flush_cache sa_list_external_library sa_server_option sa_procedure_profile sa_procedure_profile_summary sa_table_page_usage sa_validate sp_iq_reset_identity sp_iqaddlogin sp_iqbackupdetails sp_iqbackupsummary sp_iqcardinality_analysis sp_iqcheckdb sp_iqcheckoptions sp_iqclient_lookup sp_iqcolumn sp_iqcolumnuse sp_iqconnection sp_iqconstraint sp_iqcontext sp_iqconstraint sp_iqcontext sp_iqcursinfo sp_iqdatatype sp_iqdbsize 	<ul style="list-style-type: none"> sp_iqdbspace sp_iqdbspaceinfo sp_iqdbspaceobjectinfo sp_iqdbstatistics sp_iqdroplogin sp_iqemptyfile sp_iquestdbspaces sp_iquestspace sp_iqevent sp_iqfile sp_iqhelp sp_iqindex sp_iqindex_alt sp_iqindexadvice sp_iqindexfragmentation sp_iqindexinfo sp_iqindexmetadata sp_iqindexsize sp_iqindexuse sp_iqlmconfig sp_iqlocks sp_iqmodifyadmin sp_iqmodifylogin sp_iqmpxcheckdqpconfig sp_iqmpxdumpltvlog sp_iqmpxfilestatus sp_iqmpxinconnpoolinfo sp_iqmpxinheartbeatinfo sp_iqcopyloginpolicy sp_iqmpxinconnpoolinfo sp_iqmpxinheartbeatinfo 	<ul style="list-style-type: none"> sp_iqmpxinfo sp_iqmpxversioninfo sp_iqobjectinfo sp_iqpkeys sp_iqprocedure sp_iqprocparm sp_iqrebuildindex sp_iqrename sp_iqrestoreaction sp_iqrowdensity sp_iqsetcompression sp_iqsharedtempdistrib sp_iqshowcompression sp_iqshowpsex sp_iqspaceinfo sp_iqspaceused sp_iqstatistics sp_iqstatus sp_iqsysmon sp_iqtable sp_iqtablesize sp_iqtableuse sp_iqtransaction sp_iqunusedcolumn sp_iqunusedindex sp_iqunusedtable sp_iqversionuse sp_iqview sp_iqwho sp_iqworkmon
---	---	---

8.28 IQ DML_OPTIONS

Some DML options explained in Wiki link:

https://wiki.scn.sap.com/wiki/display/SYBIQ/DML_options

[dml_options2](#) - [dml_options3](#) - [dml_options4](#) - [dml_options8](#) - [dml_options10](#) - [dml_options16](#) - [dml_options35](#) - [dml_options57](#) - [DML_options115](#)

Others,

DML_Options2 = 67108864 // This option bypass optimization known as 'redundant predicate elimination'

See [KBA 2116329](#).

DML_Options2 = 8388608 // Disable elimination of redundant sort(Order By) nodes, See [KBA 2493710](#)

DML_Options8 = 8 // Disable shadow parallelism, See [KBA 2493710](#)

DML_Options7 = 131072 // Only disable parallelization in the affected area i.e. Nested Loop Pushdown Join

See [KBA 2326873](#)

JOIN_PREFERECE = -4 // Avoid HASH Join, See [KBA 2333621](#)

JOIN_PREFERECE = -5 // Avoid HASH Pushdown Join, See [KBA 2513084](#)

Note: These "DML_*" are internal database options, behavior of it can change with new releases