



Diagnosing Mission Critical Database – The PayPal Way

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About the Speakers



Manoj Bansal

- Database Engineer at PayPal for 9 yrs
- DBA for ... stopped counting 😊

Samrat Roy

- Database Engineer at PayPal for >10 yrs
- Frequent speaker at NoCOUG

Agenda



1. Primer on PayPal Databases
2. How to Identify Problem Database
3. Introduction to Diagnosis Tool
4. How to Diagnose the Issue
5. DLM Features
6. Demo
7. Q&A

Primer On PayPal Databases

- Use multiple technologies – Oracle, MySQL, CouchBase, Cassandra, Aerospike, and Mongo
- Hundreds of Oracle databases:
 - Biggest DB > 800 TB
 - Biggest DB cluster > 1.2 million SQL Executions/sec
- Use GoldenGate & Active DataGuard for DR, ReadOnly traffic offload, Active/Active workload, and Zero downtime DB failover
- Sharding and RAC for scaling workload
- RAC in active/active mode with service level isolation to avoid interconnect traffic
- Home-grown “connection pooling” (called OCC) for connection management
- Home-grown “cache” (called MayFly) for caching and latency-bridging

- AWR snapshot every 15min
- And, we love command-line tools

PayPal Challenges

- All FCI (Failed Customer Interactions) require RCA
- AWR not granular enough
- Sysmetrics not easy to consume

How We Identify Problem Database?

Healthy
DB



Un-
Healthy
DB



Session Spike!

How We Identify Problem Databases?

DB	Host	Load	Sess	Util	Host Alert
src_..._live2	ph...db132	2	67	4	1:Oracle SMON Pr
ed_..._live1	ce...db163	265	134	1	1:Over load avera
id_..._live2	sl...pass	7	10	0.00	1:Stale Freecon D
re..._live2	st...db	16	14	25	2:Over system pa

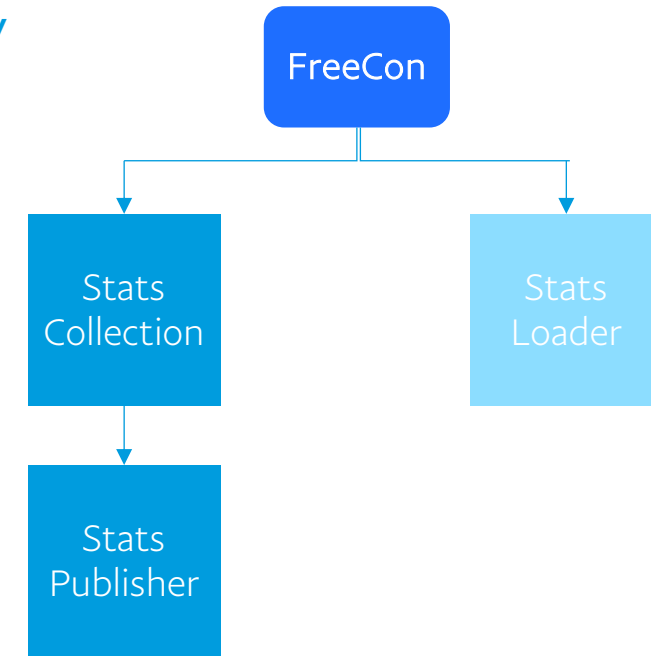
DB Family	Load	Sessions	Util	Lag	Conns	Execs	30 Minute Heatmap
> ...	43	136	46	1	9,177	2.35M	
> ...	6	133	14	0.00	1,908	177,072	
> ...1	5	135	13	0.00	1,829	176,528	
> ...C	13	102	25	6	5,859	1.10M	
> ...RO	13	136	11	0.00	2,542	779,028	
> ...	50	136	24	251	5,611	825,393	
> ...	12	26	17	0.00	3,239	43,990	
> ...	58	136	34	1	9,264	853,855	
> ...C	44	136	28	23	5,368	304,748	
> ...	27	71	32	1	3,366	158,707	
> ...C	17	73	42	0.00	6,161	95,750	
> ...	54	229	45	2,829	8,913	428,104	

- Keep eyes on many DBs at once
- Problem databases flash at the top frame
- Watch breach of multiple metrics – active sessions & Load for Primary/ADG, and Lag for ADG
- Heatmap by time
- Uses home-grown tool called "Freecon" for Data feed

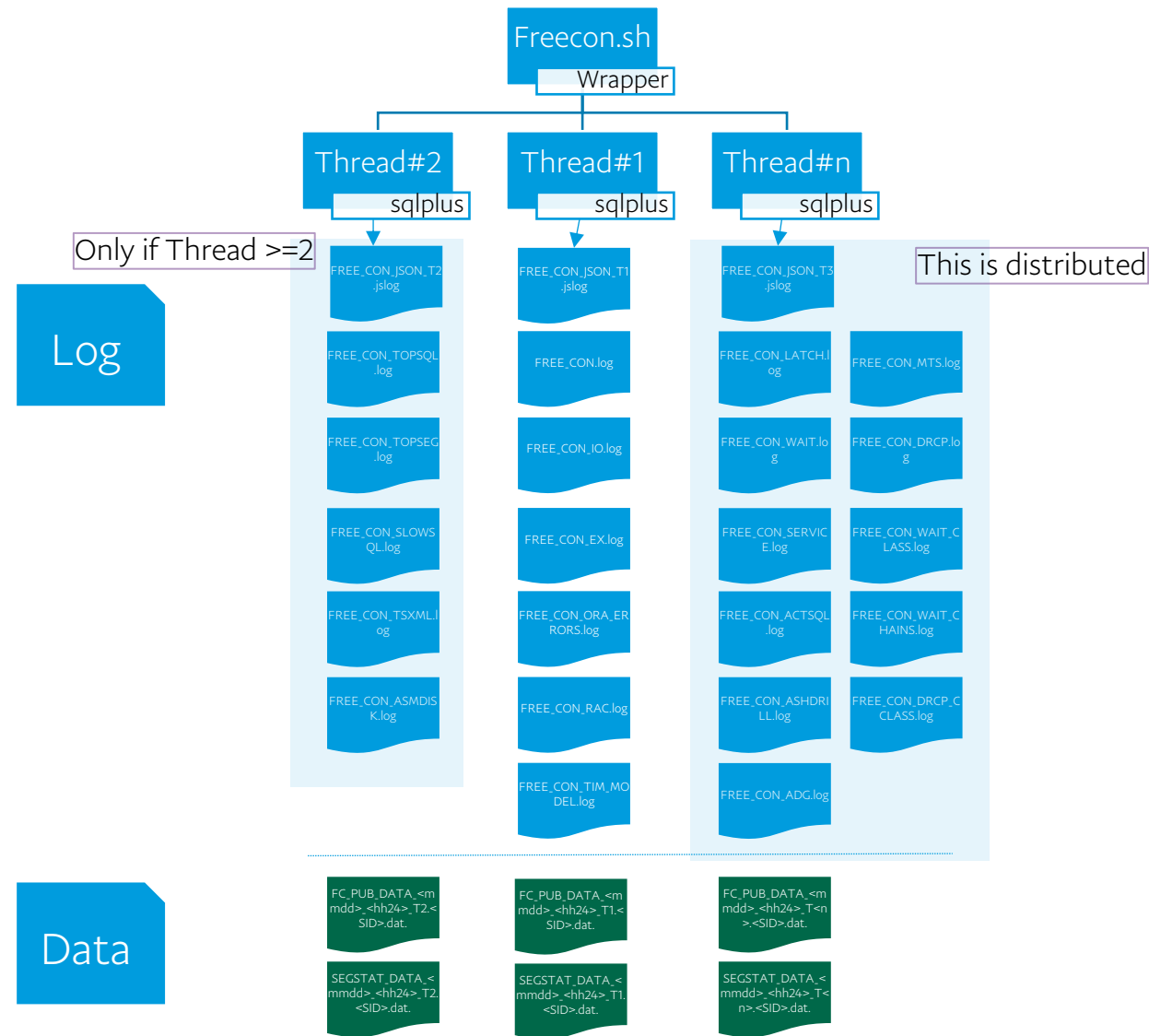
What is FreeCon?

Problem Statement: For critical databases, AWR does not offer needed granularity

- Freecon is a lightweight, home grown, PL/SQL based utility to capture and present various DB metrics
- Default collection interval of 10sec and is configurable
- Multi-threaded using different DB sessions
- Can run from both command line as well as Oracle scheduler
- Prints output to various text files, JSON files, as well as saves back into DB



Freecon Architecture



Diagnosing Various Issues Using FreeCon

Problem Statement: Identify exact start and end time of a DB issue

➤ Use FREE_CON.log

Time	Gets (blk)	PhyR (blk)	Sent (MB)	#SQL Execs	#Parse Calls	Writes (blk)	#BrBW	Load Avg	%CPU Util	Log In	Log Out	#PQ Sess	#ACT Sess	Blkd Sess	Blkr	Redo (blk)	LFPW (ms)	DBFS (ms)	SqlRsp Tm(ms)	#Conn Sess	#Act LogGrp	#ORA Err
04-26 17:09:57	4.2m	184.7k	385	219.3k	1.7k	72.9k	298	16.7	15.9	20	15	0	41	0	0	529.3k	.3	.5	1.1	6.2k	3/12	
04-26 17:10:08	4.4m	200.2k	427.6	237.8k	1.7k	84.6k	218	17.1	17.3	13	13	0	35	0	0	553.1k	.3	.5	1.1	6.2k	3/12	
04-26 17:10:18	4.6m	195.9k	449	246.5k	1.7k	75.1k	288	18.3	17.7	11	9	0	49	0	0	581.4k	.3	.5	1	6.2k	3/12	
04-26 17:10:27	4.5m	181.2k	422	233.4k	1.9k	79.7k	300	18.1	16.5	15	15	0	35	0	0	562.9k	.3	.5	1.1	6.2k	3/12	
04-26 17:10:38	4.7m	208k	439.6	250.5k	1.9k	82.9k	325	17.8	16	15	14	0	55	0	0	599.5k	.3	.5	1	6.2k	3/12	
04-26 17:10:47	4.1m	183.9k	384.1	217.9k	1.4k	75.3k	203	17.7	15.6	17	15	0	29	0	0	526.2k	.3	.5	1.1	6.2k	3/12	
04-26 17:10:58	4.7m	203.6k	436.8	244.7k	1.7k	85.7k	258	17.3	16.1	19	14	0	42	0	0	584.7k	.3	.5	1.1	6.2k	2/12	
04-26 17:11:08	4.2m	194k	395.9	221.8k	2.1k	70.1k	226	17.9	18.8	46	28	0	29	0	0	520.6k	.3	.4	1.1	6.3k	2/12	
04-26 17:11:17	4.2m	208.7k	394.8	230.9k	5.7k	62.9k	243	17.8	16	26	13	0	26	0	0	530.2k	.3	.4	1.1	6.3k	2/12	
04-26 17:11:28	4.9m	229.5k	447.3	248.2k	4.7k	81k	300	18.1	17.2	13	13	0	61	0	0	593.6k	.4	.5	1.2	6.3k	3/12	0
04-26 17:11:38	4.7m	206.6k	409.8	267.5k	4.8k	70.2k	239	18	17.4	17	17	0	31	0	0	560.3k	.3	.5	1	6.3k	3/12	0
04-26 17:11:47	4.3m	203k	387.9	225.2k	3.6k	61.7k	228	18	16.6	11	10	0	40	0	0	533.6k	.3	.4	1.1	6.3k	3/12	
04-26 17:11:58	4.6m	220.1k	416.5	233.1k	1.7k	80.3k	250	17.4	16	15	12	0	43	0	0	559.4k	.3	.4	1.1	6.3k	3/12	
04-26 17:12:08	4.1m	181.3k	366.1	205.7k	1.4k	76.8k	257	17.7	17.4	11	11	0	39	0	0	488.1k	.3	.5	1.2	6.3k	3/12	
04-26 17:12:17	4.4m	217.4k	414	231.5k	1.3k	64.1k	234	18.3	16.7	3	3	0	31	0	0	551.8k	.3	.5	1.1	6.3k	3/12	
04-26 17:12:28	5m	229k	460.5	263.1k	1.6k	74.2k	305	17.9	17	19	19	0	50	0	0	606k	.3	.4	1.1	6.3k	3/12	
04-26 17:12:38	4.4m	188.3k	401.2	222.3k	1.5k	76.4k	278	17.9	16.4	23	34	0	41	0	0	536.5k	.3	.5	1.1	6.2k	3/12	
04-26 17:12:47	4.2m	207.1k	377.5	215k	1.9k	68.4k	208	17.3	15.9	16	16	0	41	0	0	517.6k	.3	.4	1.1	6.2k	3/12	
04-26 17:12:58	4.7m	235.1k	443.3	249.5k	2.6k	93k	279	17.8	16.8	15	12	0	46	0	0	597.9k	.3	.4	1.1	6.2k	3/12	

Diagnosing Various Issues Using FreeCon

Problem Statement: Identify current top activities of a database

➤ Use FREE_CON_TOPSQL.log

Time	Sort By	Since (sec)	Sql ID	#Execs	Elpsd (ms)	CPU (ms)	BGets	Disk Reads	Fetch Count	Rows Procsd	Clustr Wt(ms)	AppWt (ms)	Concur Wt(ms)	I/O Wt (ms)	Ver Cnt	#Act Copy	#Act Plan	SQL Text
04-26 17:17:58	Elpsd	10	5amg76d8bsq2j	43.4k	1.7	.5	21.9	2	1	1	.2	0	0	1	15			SELECT /* RollupRegDMap.FINDBYPKAN
	CPU	10	gw82fby9n6usm	20.5k	1.9	1.2	38.8	.9	1.1	22	.1	0	0	.4	7			WITH UNION_TABLE /* SlidingWindowG
	#Ver	10	frbhrv6qxv3rq	1.6k	.2	.2	7.8	0	0	1	0	0	0	0	470			INSERT INTO /* SeedGenericKeyValueM
	#Copy	10	19jgnygju1264	1	0	0	0	0	1	1	0	0	0	0		2		SELECT NVL(SUM(KGHLUF5H),0), NVL(SU
	Execs	10	a5173510hfgz4	38.1k	.3	.1	9.6	.1	1.1	.7	0	0	0	.1	17			SELECT /* RollupVwDMap.FINDALLBYEN
	#Ver	10	2r5c4kc3jwv2c	37.6k	.2	.2	8.3	0	0	1	0	0	0	0	430			UPDATE /* RollupRegDMap.UPDATEPK.1
	#Copy	10	1c8qvxl1duwat	1	42.6	41.2	0	0	1	1	0	0	0	0				select nvl(sum(TOTAL_WAITS),0), nvl
	Elpsd	10	9s8j9bxb5gx2x	18.8k	1.4	.9	31.4	.6	1.1	15.3	.1	0	0	.3	7			WITH UNION_TABLE /* SlidingWindowG
	#Ver	10	1uhay0z8nayqn	5.3k	.3	.2	7	0	0	1	.1	0	0	0	356			INSERT INTO /* RollupRegDMap.INSER
	#Ver	10	151j2kufx01px	511	.7	.2	15.1	.7	1	7.1	.1	0	0	.4	289			SELECT /* AcctCCVerifyEventMap.FIN
	DiskR	10	cctth1p10wcjw	1.8k	2.3	1.2	33.2	1.9	1.1	17.7	.2	0	0	1	7			WITH UNION_TABLE /* SlidingWindowG
	#Ver	10	a7zpug7xbhn42	7	10.1	3.1	154.3	12.6	1.7	22	.9	0	0	6.6	137			SELECT /* RollupVwDMap.FINDALLBYEN
	Elpsd	10	196mqnmngxpv1	0	4.8k	1.2k	0	0	1	1	0	0	0	1.2				select sysStat.branchnodesplits ,
	DiskR	10	0mxd7afvm1s6t	412	6.2	2.5	85.5	6.3	1.8	140.2	.7	0	0	3.1	2			SELECT /* AcctBeaconEventMap.FIND_A
	BGets	10	1vwxd8sgzsw5	10.5k	.3	.2	8.2	0	1.6	.9	0	0	0	0	3			SELECT 300 as GRANULARITY, ENTITY_K
04-26 17:18:08	Elpsd	10	5amg76d8bsq2j	39.5k	1.7	.5	21.9	2	1	1	.2	0	0	1	15			SELECT /* RollupRegDMap.FINDBYPKAN
	CPU	10	gw82fby9n6usm	19.2k	1.9	1.2	37.9	.8	1.1	21.1	.1	0	0	.4	7			WITH UNION_TABLE /* SlidingWindowG
	#Ver	10	frbhrv6qxv3rq	1.6k	.2	.2	7.8	0	0	1	0	0	0	0	470			INSERT INTO /* SeedGenericKeyValueM
	#Copy	10	19jgnygju1264	1	0	0	0	0	1	1	0	0	0	0		2		SELECT NVL(SUM(KGHLUF5H),0), NVL(SU
	Execs	10	a5173510hfgz4	36.6k	.3	.1	9.8	.2	1.1	.7	0	0	0	.1	17			SELECT /* RollupVwDMap.FINDALLBYEN
	#Ver	10	2r5c4kc3jwv2c	34k	.2	.2	8.3	0	0	1	0	0	0	0	430			UPDATE /* RollupRegDMap.UPDATEPK.1

Diagnosing Various Issues Using FreeCon

Problem Statement: Identify which wait events sessions were waiting for from ASH data

➤ Use FREE_CON_ASHDRILL.log

Time	Sample Time	Event Name	#Session	Avg Waited (ms)	Max Waited (ms)	Sample SqlID1	Sample SqlID2
03-27 10:47:49	03-27-2019 10:47:40	virtual circuit wait	102	1.7k	4.3k	0dq7s4afnmzaa	gvd05sjp6d39k
		enq: TX - row lock contention	4	206.2	824.8	1rdmqh5xkvnrq	b704afu9jmj41
	03-27-2019 10:47:41	virtual circuit wait	8	1.4k	4.3k	2u60pkh9dg51m	g6txpcbtatdd
		enq: TX - row lock contention	4	1.5k	3k	1rdmqh5xkvnrq	b704afu9jmj41
	03-27-2019 10:47:42	virtual circuit wait	49	200.9	516.1	0wn91zpddt6zk	ghbzkc5nx8cx1
		db file sequential read	28	13.8	35	0jc836dawjs2j	gfy8107tdm92v
		latch free	17	982.7	996		
	03-27-2019 10:47:43	direct path read	8	11.6	19.8	1a3y61nvnnp865	96581f87jf16w
		virtual circuit wait	32	777.6	1.2k	1a3y61nvnnp865	gvd05sjp6d39k
		cursor: pin S wait on X	10	457.4	463.3	2cysm8g3puc4p	g0c1jmn1hzvsp
	03-27-2019 10:47:44	buffer busy waits	5	614.9	663.4	2t8fkmvqmm6j	cmzsd95hjyz0x
		enq: TX - row lock contention	2	0	0	1rdmqh5xkvnrq	4tmsdc8dv5247
		virtual circuit wait	24	164.5	1k	0j5136pwmjq1q	gu8b9u466zb0f
	03-27-2019 10:47:45	null event	2	0	0		
		enq: TX - row lock contention	2	576.9	1.2k	1rdmqh5xkvnrq	4tmsdc8dv5247
		virtual circuit wait	32	1.3k	2.7k	0j5136pwmjq1q	fsng8qw7nu569
	03-27-2019 10:47:46	null event	14	0	0		
		SQL*Net message to client	8	952.8	958.2	dm0yvxxmr61j91	
		log file sync	2	10.6	12.2		
	03-27-2019 10:47:47	virtual circuit wait	7	828.9	2.6k	8kdsfmkfwwxv8	fkfym0xunjwjb
		buffer busy waits	3	554.7	594.5	0vc8zrasvng0d	8cn6bny51hcqa
		latch free	50	0	0		
	03-27-2019 10:47:47	virtual circuit wait	40	0	0	3n4bzqwdzu312	gvd05sjp6d39k



Diagnosing Various Issues Using FreeCon

Problem Statement: Identify which wait events sessions were waiting for from ASH data

➤ Use FREE_CON_ACTS.sql.log

Time	#Sess	Since	Sql ID	#Execs	Elpsd	CPU	BGets	Disk	Fetch	Rows	Clustr	AppWt	Concur	I/O	Wt	Ver	Parser	SQL Text
		(sec)			(ms)	(ms)		Reads	Count	Procsd	Wt(ms)	(ms)	Wt(ms)	(ms)	Cnt			
04-30 13:18:38	10	10	92qa40bm7zhvz	529	128.9	111.8	6.8k	0	1	0	0	0	0	0	4			SELECT /* AMQQue
	3	20	8pnb5p68kxur3	1.4k	33	28	8.4k	0	1.3	1.3	0	0	0	0	5	C		SELECT LAST_PART
	3	10	c3n5zs3h2ntf2	1k	27.6	22.3	1.1k	0	1	0	0	0	0	0	4	G		SELECT /* AMQQue
	2	10	fs8g7zjssqrna	0	0	0	0	0	0	0	0	0	0	0	3	N		SELECT /*+ USE_C
	1	121	231z8vdayx64y	12	54.6	54.4	0	0	1	24.9	0	0	0	0	10	P		WITH ACTIVE_SQLS
	1	121	23xq6ndat7gcd	12	1.9k	1.9k	0	0	1	195	0	0	0	0	2	P		SELECT NULL SERV
	1	60	2rhph3z0xau0x	13.9k	1.3	.5	37.3	.6	0	1	0	0	0	.9	3	T		/* WLogEntry--cr
	1		36wygk61dcawh													M		DELETE FROM /* A
	1		3ap8w92xjfxwz												4	I		SELECT /* AMQJob
	1		3z5nrtzkmaams													S		SELECT /* AMQReq
04-30 13:18:47	4	9	92qa40bm7zhvz	295	127.5	110.7	7k	0	1	0	0	0	0	0	4			SELECT /* AMQQue
	3	19	792pfsdfm0uaz	943	46.9	40.3	12.1k	0	1.3	1.3	0	0	0	0	3	C		SELECT LAST_PART
	2	19	83vxgvhpcv23s	2k	22	17.3	843.2	0	1	0	0	0	0	0	5	G		SELECT /* AMQQue
	2	19	5w00b5kjyf9gz	290	129	110.3	6.9k	0	1	0	0	0	0	0	2	M		SELECT /* AMQQue
	2	29	8qn4xuaksvd7x	6	1.8k	1.7k	987k	0	1	0	0	0	0	0	0	T		/* Payments10Dao
	2	9	c3n5zs3h2ntf2	857	27.9	22.2	1.1k	0	1	0	0	0	0	0	4	G		SELECT /* AMQQue
	2	9	8pnb5p68kxur3	619	33.7	29.1	8.8k	0	1.3	1.3	0	0	0	0	5	C		SELECT LAST_PART
	1		2fq5cnjkkwgp8												3	N		SELECT /*+ USE_C
	1	130	2mxdmv49xtyyq	6.6k	1.3	1.2	58.2	0	53	1k	0	0	0	0	764	M		SELECT scuttle_i
	1	60	429s9mcfkzrba	15.9k	.4	.4	25.9	0	1.1	1	0	0	0	0	0	Q		SELECT LAST_PART

Diagnosing Various Issues Using FreeCon

Problem Statement: Identify top wait events

➤ Use FREE_CON_WAIT.log

Time	Event ID	Name	#Waits	WaitTm Avg(ms)	WaitTm (ms)	WaitTm FG(ms)	#Wait Chain	Blocked SessCnt	Blocker SessCnt	#Sess BlkdByWt	MaxWt (sec)	Blocker1 SID@Inst	#Obj inWt	Blocked Object
04-30 12:26:00	2160405876	latch: virtual circuit queues	35k	6.7	234.6k	9.4								
	1729366244	cursor: pin S wait on X	19	4k	76.8k	76.8k	3	3	0		2	23082@1	0	
	2900469894	virtual circuit wait	37.1k	1.9	70.4k	69.9k	14	0	0		28		2	ENTITY_VERIFIC
	1091942974	virtual circuit next request	6.4k	4.4	27.9k	27.9k	4	0	0		13		3	PARTNERAPP_PAR
	782339817	jobq slave wait	42	500	21k	21k								
	2610814049	PX Deq Credit: send blkd	42	493	20.7k	20.7k	2	0	0		9		0	
	98582416	PX Deq: Execution Msg	2	10k	20k	20k	2	0	0		9		1	GG_PAYMENT_SID
	310662678	enq: TX - row lock contention	15	828.3	12.4k	12.4k	1	1	0		31	40838@1	1	WMERCHANT_FILE
	3999721902	log file parallel write	5.8k	1.8	10.2k	0								
	3378470826	LNS ASYNC end of log	5.7k	1.7	9.9k	0	1	0	0		0		0	

Diagnosing Various Issues Using FreeCon

Problem Statement: Identify top wait events

➤ Use FREE_CON_WAIT_CHAINS.log

Time	Wait Event Name	SID	#Wait (sec)	SID@Inst of Blocker	#Sess Blocked	Blocked/Blocking Obj Name	RowID
04-30 12:26:00	SQL*Net message from client	40838@1	33		1	SYS_LOB0003492557C00013\$\$ [SYS	
	enq: TX - row lock contention	12742@1	31	40838@1	0	WMERCHANT_FILE [WMF_PART_5]	AAM90XA0kAAA5fBAAf
	cursor: pin S wait on X	1427@1	2	23082@1	0		
	cursor: pin S wait on X	33590@1	2	23082@1	0		
	cursor: pin S wait on X	46178@1	2	23082@1	0		
04-30 12:26:09	SQL*Net message from client	40838@1	43		1	SYS_LOB0003492557C00013\$\$ [SYS	
	enq: TX - row lock contention	12742@1	41	40838@1	0	WMERCHANT_FILE [WMF_PART_5]	AAM90XA0kAAA5fBAAf
	cursor: pin S wait on X	1427@1	11	23082@1	0		
	cursor: pin S wait on X	33590@1	11	23082@1	0		
	cursor: pin S wait on X	46178@1	11	23082@1	0		
	cursor: pin S wait on X	48410@1	7	23082@1	0		

Diagnosing Various Issues Using FreeCon

Problem Statement: Identify current top objects in the database

➤ Use FREE_CON_TOPSEG.log

Time	Reason	Table Name	#Block Change	#Log Reads	Alloc (mb)	Used (mb)	#PhyR Req	#phyW Req	#phyR Blocks	#phyW Blocks	#Seg Scans	#Row LockWt	#ITL Waits	
07-25 18:10:09	1.BlkC	F	ARING_JB	82.2k	1.7m	0	0	0	55	0	55	0	239	0
	1.BlkC	C	GS	47.1k	23.5k	.1	.1	0	13	0	13	0	0	0
	1.BlkC	C	INTERNAL_JB	44.9k	2.8m	0	0	0	11	0	11	0	50	0
	1.BlkC	G	CE_JB	38.9k	149k	0	0	0	14	0	14	0	543	0
	2.LogR	H	ION_ARCHIVE	0	3.1m	0	0	0	0	0	0	0	0	0
	2.LogR	T	XTENSION_DATA_P2	384	1.7m	.3	.2	0	12	0	12	0	0	0
	3.PhyIO	C		9.5k	24.7k	.4	.4	0	922	0	922	0	0	0
	3.PhyIO	C	_Q	30k	62.4k	12.8	11.1	0	622	0	622	0	0	0
	3.PhyIO	C	Q	17.5k	50.7k	10	0	0	557	0	557	0	0	0
	3.PhyIO	C	RQ	2.4k	5.1k	2.9	2.4	0	162	0	162	0	0	0
	6.RowLck	C	B	38.1k	308.6k	0	0	0	47	0	47	0	381	0
	4.MBUsed	C	STLIFECYCLE_Q	2.9k	9.8k	2	1.7	0	110	0	110	0	0	0
	6.RowLck	F	KPOST_JB	6.2k	15.1k	0	0	0	0	0	0	0	175	0
	4.MBUsed	C	EX	960	2k	1.3	1.1	0	41	0	41	0	0	0
	6.RowLck	C	JB	6.4k	41.8k	0	0	0	3	0	3	0	154	0
	4.MBUsed	C	_RQ	928	2.1k	.8	.7	0	7	0	7	0	0	0
	6.RowLck	I	03	1.2k	2.5k	0	0	0	0	0	0	0	152	0
	4.MBUsed	S	OREDVALUE_Q	1.6k	23k	.8	.7	0	23	0	23	0	0	0
07-25 18:10:38	1.BlkC	F	ARING_JB	84.4k	1.7m	0	0	0	80	0	80	0	183	0

Diagnosing Various Issues Using FreeCon

Problem Statement: Quick scanning of Alert.log for errors

➤ Use FREE_CON_ORA_ERRORS.log

Time	Error Code	#Errors	Error Description
04-03 09:24:07	ORA-1652	1	ORA-01652: unable to extend temp segment by in tablespace
04-04 00:47:00	ORA-1652	1	ORA-01652: unable to extend temp segment by in tablespace
04-04 13:59:37	ORA-1652	1	ORA-01652: unable to extend temp segment by in tablespace
04-04 14:03:25	ORA-1652	1	ORA-01652: unable to extend temp segment by in tablespace
04-11 09:47:28	ORA-00028	2	ORA-00028: your session has been killed
	ORA-00603	1	ORA-00603: ORACLE server session terminated by fatal error
	ORA-01012	2	ORA-01012: not logged on
	ORA-02063	6	ORA-02063: preceding from
	ORA-603	1	ORA-00603: ORACLE server session terminated by fatal error
04-11 13:17:19	ORA-1652	1	ORA-01652: unable to extend temp segment by in tablespace
04-11 13:30:19	ORA-1652	1	ORA-01652: unable to extend temp segment by in tablespace
04-11 18:53:16	ORA-1652	1	ORA-01652: unable to extend temp segment by in tablespace
04-16 18:36:15	ORA-02067	1	ORA-02067: transaction or savepoint rollback required
	ORA-12012	1	ORA-12012: error on auto execute of job
04-16 18:36:46	ORA-12012	1	ORA-12012: error on auto execute of job
	ORA-12541	1	ORA-12541: TNS:no listener

Understanding FreeCon heatmap

desc freecon_segstat

Name	Null?	Type
STATS_TYPE	NOT NULL	CHAR(1)
DB_UNIQUE_NAME	NOT NULL	VARCHAR2(30)
STATS_TIME	NOT NULL	DATE
OWNER		VARCHAR2(30)
TABLE_NAME		VARCHAR2(30)
PARTITION_NAME		VARCHAR2(30)
SUBPARTITION_NAME		VARCHAR2(30)
BLOCK_CHANGES		NUMBER
LOGICAL_READS		NUMBER
PHYSICAL_READ_REQUESTS		NUMBER
PHYSICAL_WRITE_REQUESTS		NUMBER
PHYSICAL_READS		NUMBER
PHYSICAL_WRITES		NUMBER
SPACE_ALLOCATED_MB		NUMBER
SPACE_USED_MB		NUMBER
SEGMENT_SCANS		NUMBER

Stats_Type	Rollup Window
M (Monthly)	yearly
W (Weekly)	Bi-monthly
D (Daily)	monthly
H (Hourly)	weekly

Partition	Block Change	Logical Read	BC_24HRS	BC_7DAYS	BC_30DAYS	BC_90DAYS	LR_24HRS	LR_7DAYS	LR_30DAYS	LR_90DAYS	LR_180DAYS
Table	33708683584	396596378400	.62	4.07	15.66	36.27	.57	3.64	13.5	32.02	61.68
Current P	1000412320	3426039616	18.48	100			28.69	100			
P-1	5312507376	35989423184	.44	6.82	79.71	100	2.1	20.55	88.74	100	
P-2	5528655936	46428682416	.01	.05	.44	100	.48	3.27	17.97	100	

In-Database Archiving/Compression using FreeCon

