

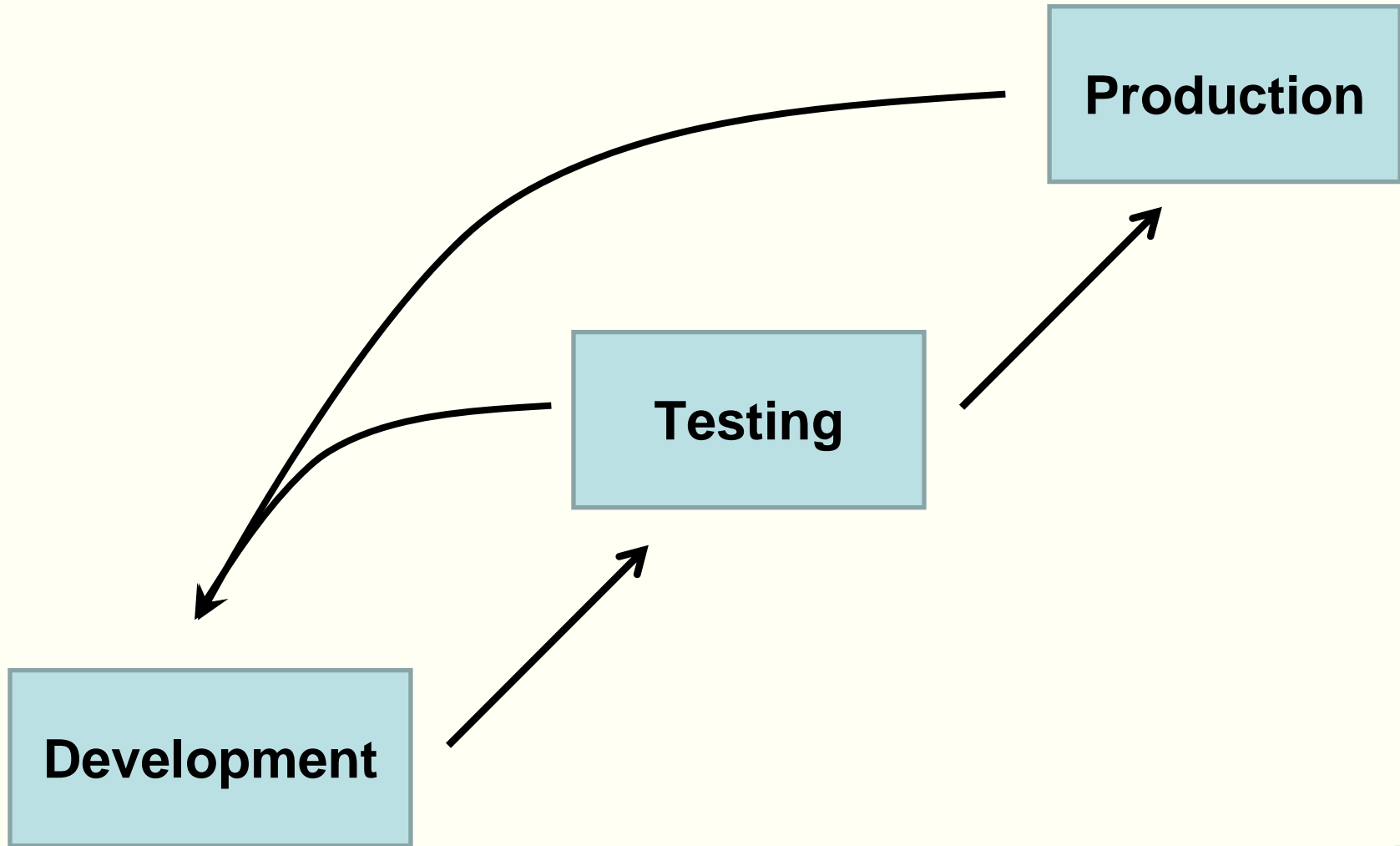


Database Maintenance

Dmitry Kuzmenko, IBSurgeon



Database lifecycle





- Development <> Production
- Testing may be complicated
- Hardware at production may be very different
- Data in the production database may vary even for similar customers



The Goals



- Check database health
- Check database performance
- Check server environment
- Schedule maintenance operations
- Availability to collect the status and to get it online or offline
- Make customer happy
- Protect yourself





- Transactions interaction
 - garbage
- Index statistics
 - optimizer chooses plan using index statistics





IBAnalyst 2.7. Loaded from C:\Users\...\Desktop\nmz20090420.txt

Statistics Reports View Options Help

Databases Summary Tables Indices Tables + Indices

Parameter	Value
Database info	
Database name	c:\ISKRa\iskra31.fdb
Creation date	06.04.2009 1:33:17
Statistics date	20.04.2009 17:20:10
Page size	4096
Forced Write	OFF
Dialect	3
OnDiskStructure	10.1
Sweep interval	20000
Oldest transaction	12016163
Oldest snapshot	10881240
Oldest active	12016164
Next transaction	22120301
Sweep gap (snapshot - oldest)	-1134923
TIP size	1351 pages, 5404 kilobytes
Snapshot TIP size	10104138 transactions, 2471 kilobytes
Active transactions	10104137, 685% of daily average
Transactions per day	1474686, for 15 days
Data versions percent	29.35% - records: 1353 mb, versions: 397 mb, pages 2679 mb, indices 586 mb
Fragmented tables	
Versioned tables	
LASTARH_TBL	Records: 5078, versions: 156140, verlen is 83% from reclen
LASTOTI_TBL	Records: 52, versions: 3330, verlen is 66% from reclen
LASTVAL_TBL	Records: 108, versions: 291924, verlen is 86% from reclen
TECHN_TBL	Records: 108, versions: 15125514, verlen is 16% from reclen

Tables fragmented with blobs

Some transaction is active for 7 days, blocking garbage collection.





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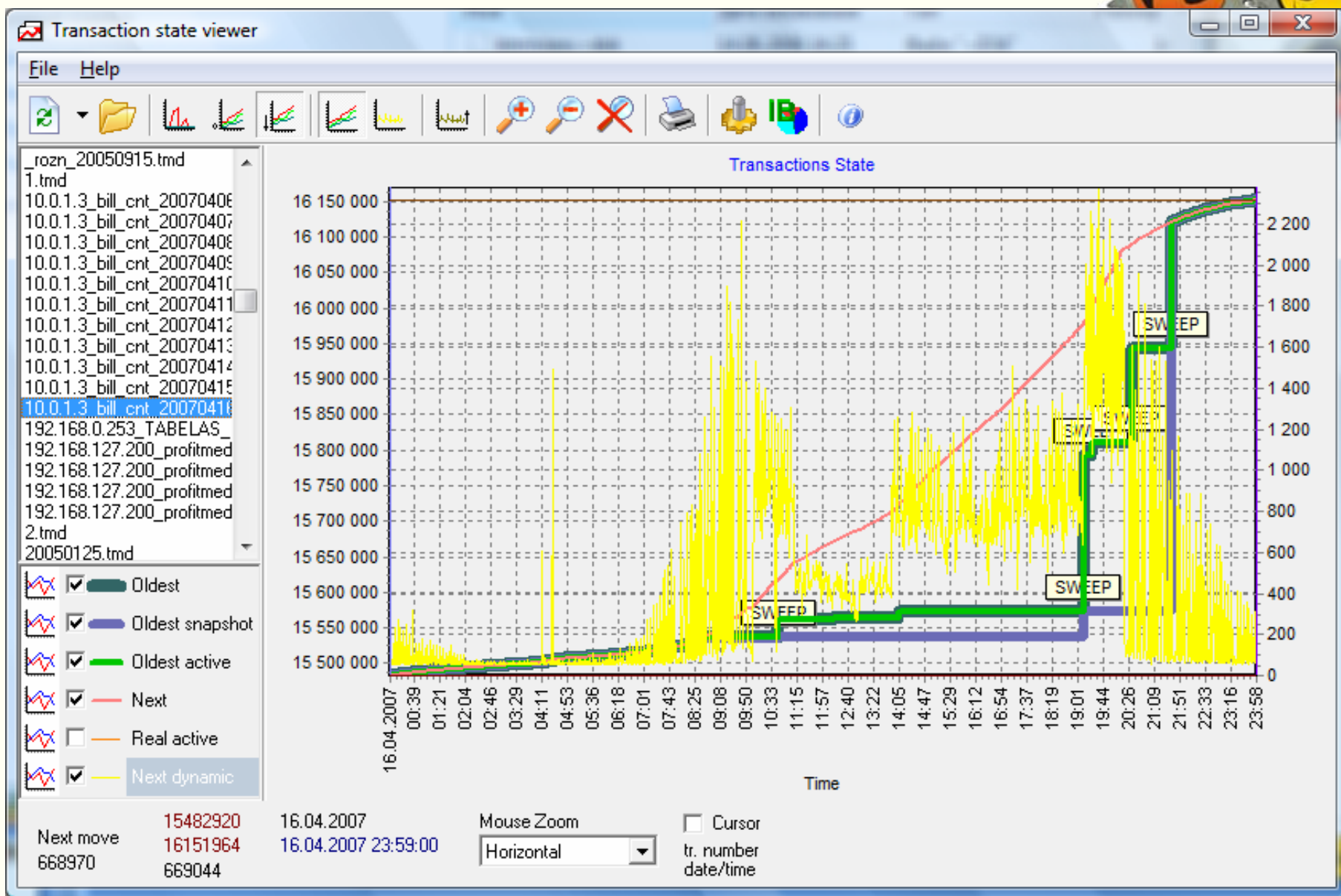
Statistics Reports View Options Help

Databases Summary Tables Indices Tables + Indices

Table	Records	RecLength	VerLen	Versions	Max Vers	Data Pages	Size, mb	Slots
TECHN_TBL	108	147.46	9.01	15125514	1376556	104380	407.73	104
LASTVAL_TBL	108	17.37	12.70	291924	2703	2276	8.89	2
DETAIL_TBL	332508	7.14	20.61	217404	1	5038	19.68	5
LASTARH_TBL	5078	17.23	11.42	15614	225	1220	4.77	1
ARHIVM_TBL	86930	16.99	9.00	593	224	1628	6.36	1
LASTOTI_TBL	52	22.52	9.04	3	674	24	0.09	
OTKAZ_TBL	41	3.24	23.77		3	1	0.00	
ENGINEER_TBL	42	28.62	44.47		1	1	0.00	
ARHIVD_TBL	1692979	17.31	0.00		0	23893	93.33	23
ARHIVH_TBL	36431434	20.08	0.00		0	546796	2135.92	546
AVARSPIS_TBL	0	0.00	0.00		0	0	0.00	
BLANK_TBL						5	0.02	
COMMAND_TBL							0.01	
COMSCREEN_TBL							0.00	
CONTROL_TBL							0.02	
DOPINI_TBL							0.00	
EVENTD_TBL							0.00	
FACTORYOBJE							0.00	
GRLINK_TBL							0.00	
INDSHEM_TBL							0.00	
ISKRA\$SYSTE							0.00	
KISHEM_TBL							0.00	
KRAN_TBL							0.00	
KTSHEM_TBL	23	64.60	0.00	0	0	1	0.00	
LABELSHEM_TBL	0	0.00	0.00	0	0	0	0.00	

The result is 15 million versions for 108 records table, and 1376556 versions for ONE record of this table!







- Lot of clients have 1 HDD
- and this HDD have only 1 logical disk
- Lot of clients run other programs at that computer
- Sometimes Firebird is being installed at file server





- Database size
- Delta size (nbackup)
 - also delta time need to be checked
- Backup size
- NBackup files size
- Temp directory size
 - queries with PLAN SORT, creating indices





- ALTER TABLE limits
 - some applications allow to construct tables by user, or allow to add/drop columns to existing tables
- ODS 10 table size limit – 36.7GB
- Transaction number limit – 2.4 billion (MaxInt)
- ...





- MON\$
 - current state of the server
- GSTAT -a -r (-h)
 - snapshot of a database state
- firebird.log
 - history of events (errors)
- The whole picture can be seen only if those statistics is saved constantly



The Task



- Lot of things to monitor
- Lot of things to automate
- Lot of things to save for monitoring

- email notification
- remote access



Solution



- FBDataGuard CE
- or
- HyperFirebird



HyperFirebird - What is that?



- Pre-Alpha, release is scheduled for Firebird 2.5 release
- Automates backups (including nbackup)
- Gathers statistics – header page (transactions), table and indices, RAM, CPU, IO, etc.
- IBAnalyst report functions
- Backup of metadata and other valuable database structures, allowing to restore broken database
- firebird.log watch and analyze
- watch spaces
- configurable alerts
- email admin notification
- lot of other functions
- web interface, cross-platform (java)





- Even on single computer without internet it saves all the gathered info, that can be copied to the flash drive and analyzed somewhere else
- For the enterprise – many Firebird servers can be watched from one Console
- Interface is open
- Open-source





- Questions?
- www.ib-aid.com
- support@ib-aid.com
- beta@ib-aid.com

