



Everything about backups

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Backup methods



- gbak
- nbackup/online dump
- scripts
- stop server and copy
- no backups



Rescue plan



- what is a failure
- how many data will be lost
- how long company can wait





- Can happen at any time by any cause
- Database corruption
 - light – can be corrected by gfix, IBFirstAid/FBFirstAid
 - hard – can be only restored from backup
- Anyway, it takes time. How much?
 - gfix or FBFirstAid – depends on the database size, up to several hours
 - backup, gbak – several hours
 - nbackup – several minutes





- Choose appropriate backup type
- Check restore time, multiply it by 2, since always things can go wrong
- Try to understand how many data can be lost since last backup

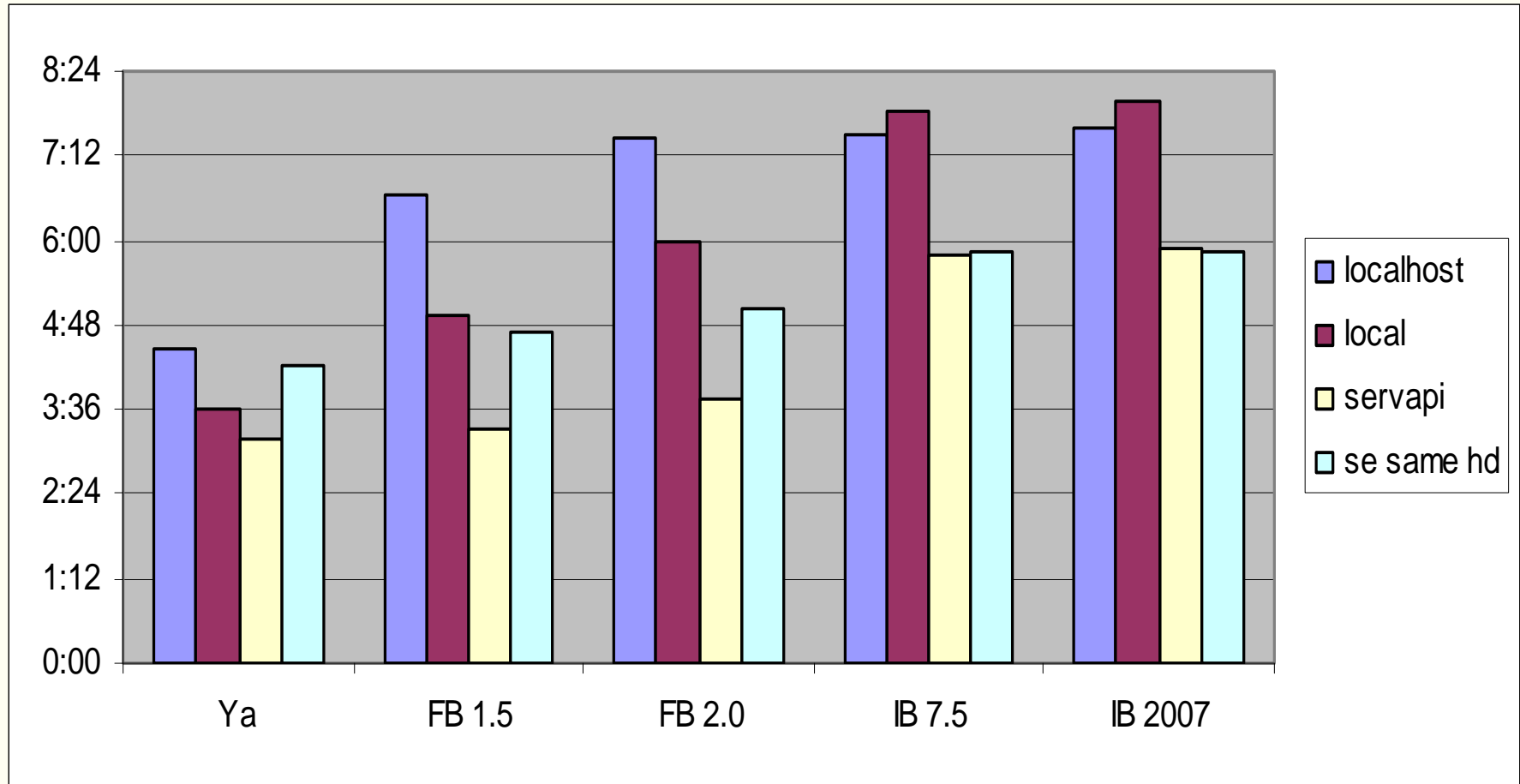




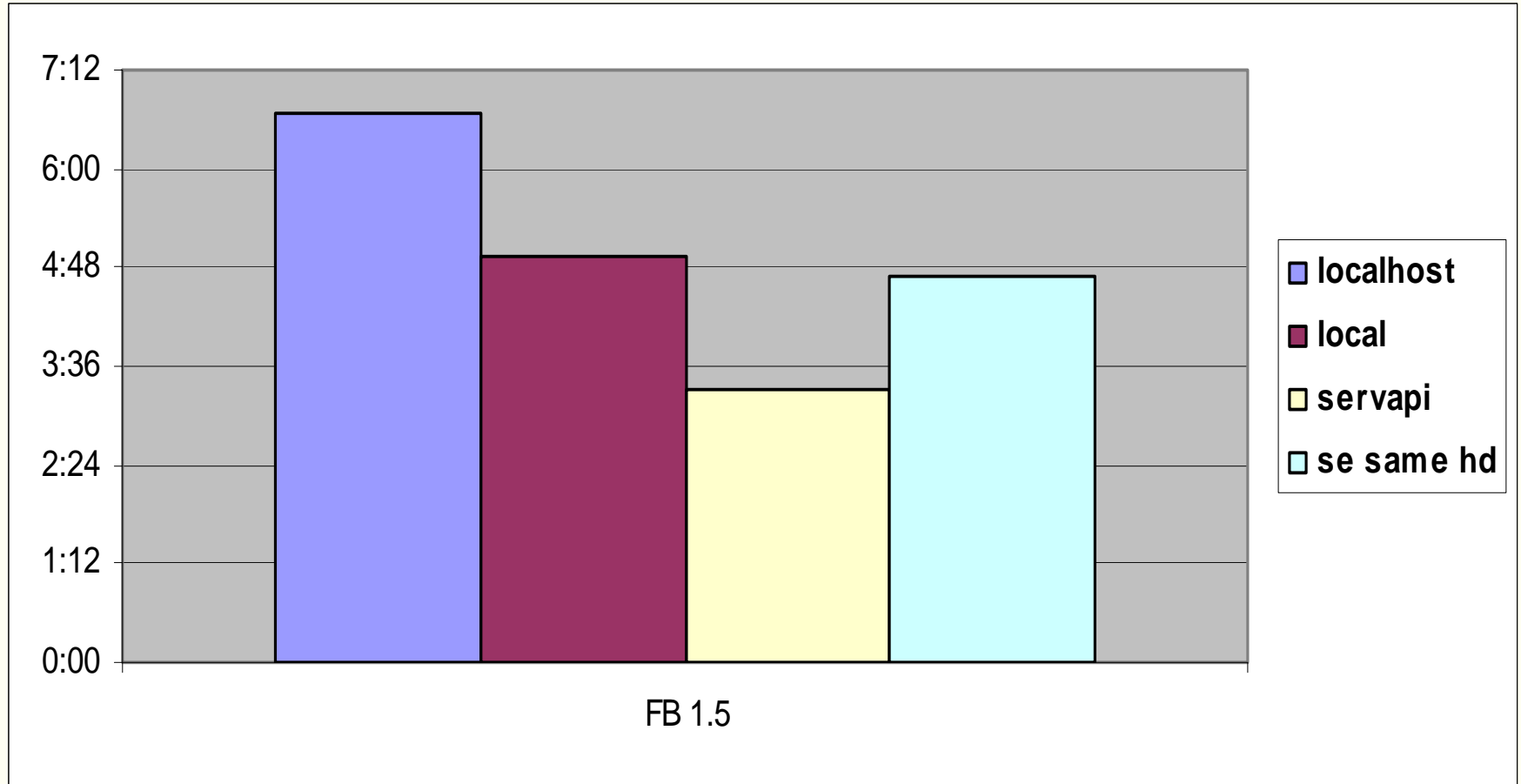
- backup speed
- restore speed
- flaws
- goods
- usage
- tools



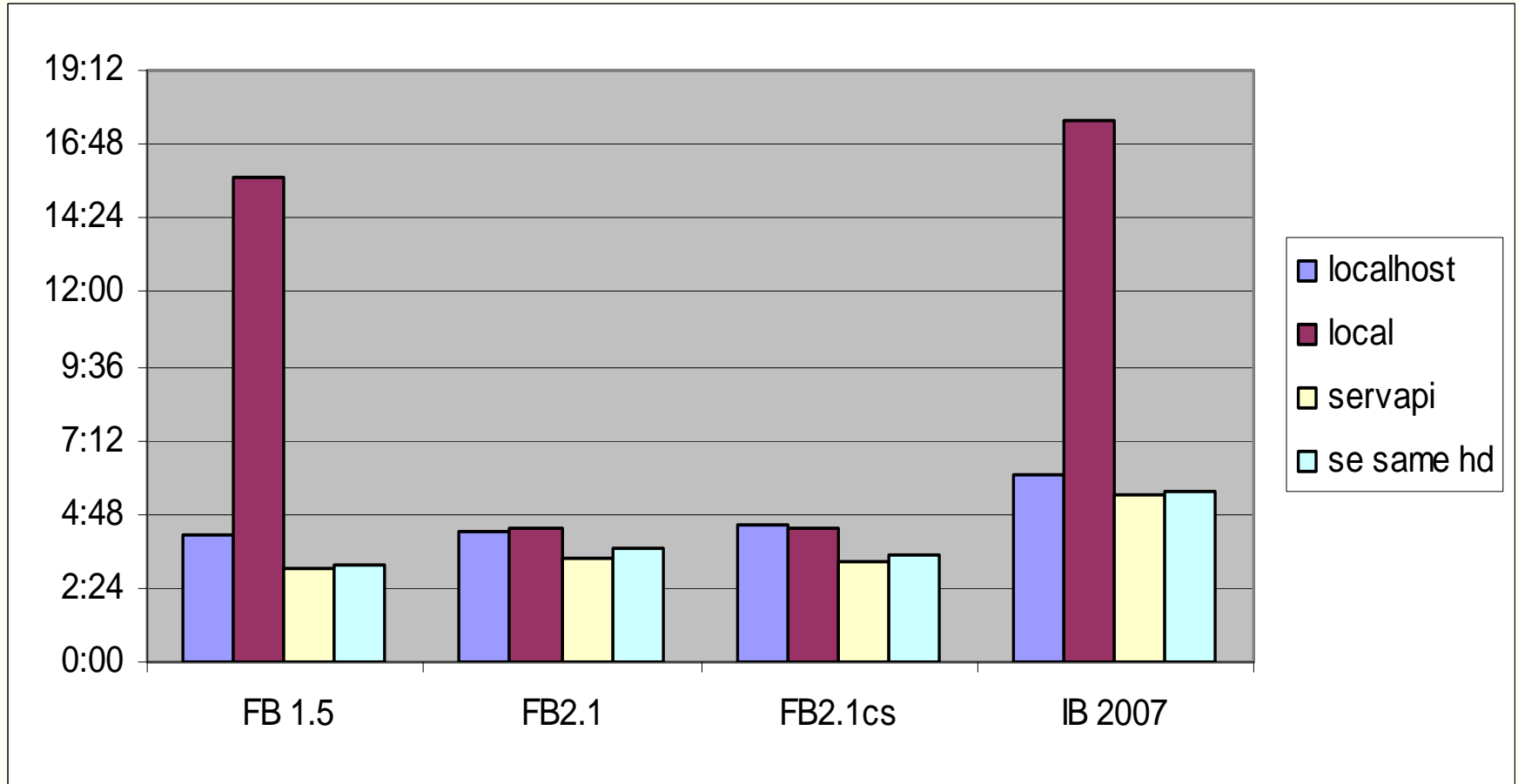
Backup speed



single processor (core)



2 cores





- Firebird 1.5, Interbase - do not use local protocol where processors or cores are more than one
 - use localhost or Services API instead, it's 2 times faster
- Firebird 2.x local protocol does not have that problem



Restore speed



- database 3.8gb
 - backup – 4 minutes, 15 minutes worst case
 - restore - ~1 hour.



Non-restorable backups



- why?
- how to fix it?
- best script



Non-restorable backup



- broken primary keys
 - duplicate records
- broken foreign keys or lost records in the reference tables
 - need to delete referencing records or to create records that were lost
- broken backup file
 - IBBackupSurgeon





- Check metadata
 - gbak –b –m, gbak –c
 - compare with dbcompare
- backup, without garbage collection
 - gbak –b –g
- test restore
- always save metadata script
 - isql database.fdb –x >script.ddl





- backup speed
- restore speed
- flaws
- goods
- usage
- tools
- InterBase dump





DATABASE

Delta

- LOCK
- Changes goes to delta
- Copying
- Applying delta to DB





- each nbackup run scans (reads) the whole database – same as database file copy speed
- amount of writes depends on number of pages, changed from previous nbackup level





- restore needs to
 - copy level 0 database (full file) to the original place
 - read all specified level backup files and write them to the database
- so, restore speed is equal to copying all specified levels of nbackup from one place to another



NBackup flaws



- backup level 0 is a database, but you can't use it as database, until you "fix" it
- if you "fix" database backup level 0, you can't add any levels (1-2-3) to it
- you can't update database with level backups
- nbackup of any level always scans (reads) the whole database
- nbackup is a page copy. database damage is not controlled
- **!** on Classic, nbackup can freeze until some process commits changes to the database
 - this result longer time of nbackup than expected, and can cause delta file live for hours. During this time you can't make any nbackups



NBackup is good



- It is fast, as copying file
 - 6 minutes for 13gb database
- you may organize levels for the needed rate
- restore is also fast





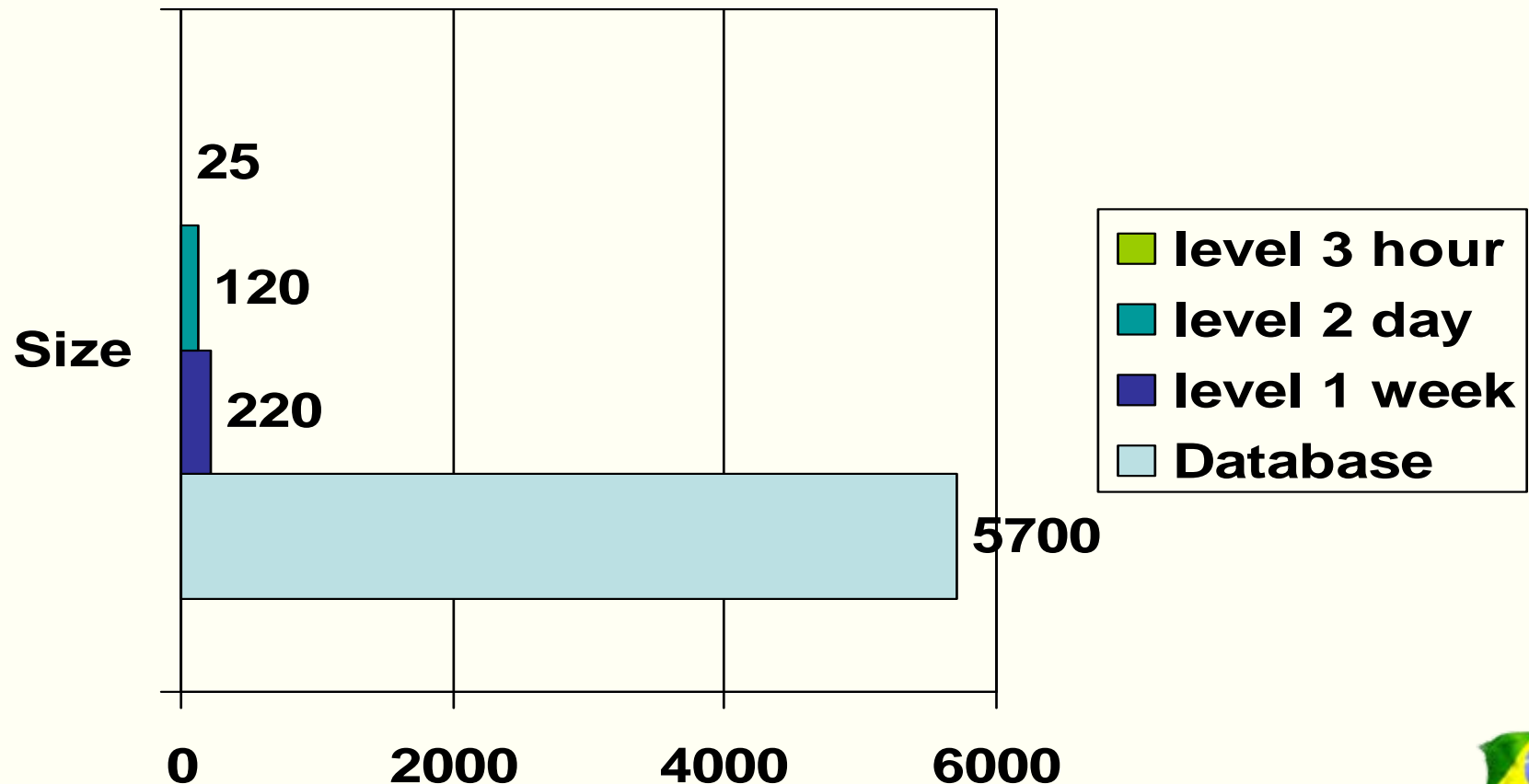
- level 0 – each month
 - level 1 – each week
 - level 2 – each day
 - level 3 – each 2 hours
- monthly - kept the whole year
- weekly – last 1-2 months
- daily – last 1-2 weeks
- hourly – 1 week
- usually archives are compressed
 - not good, because decompression takes time



NBackup sample 1



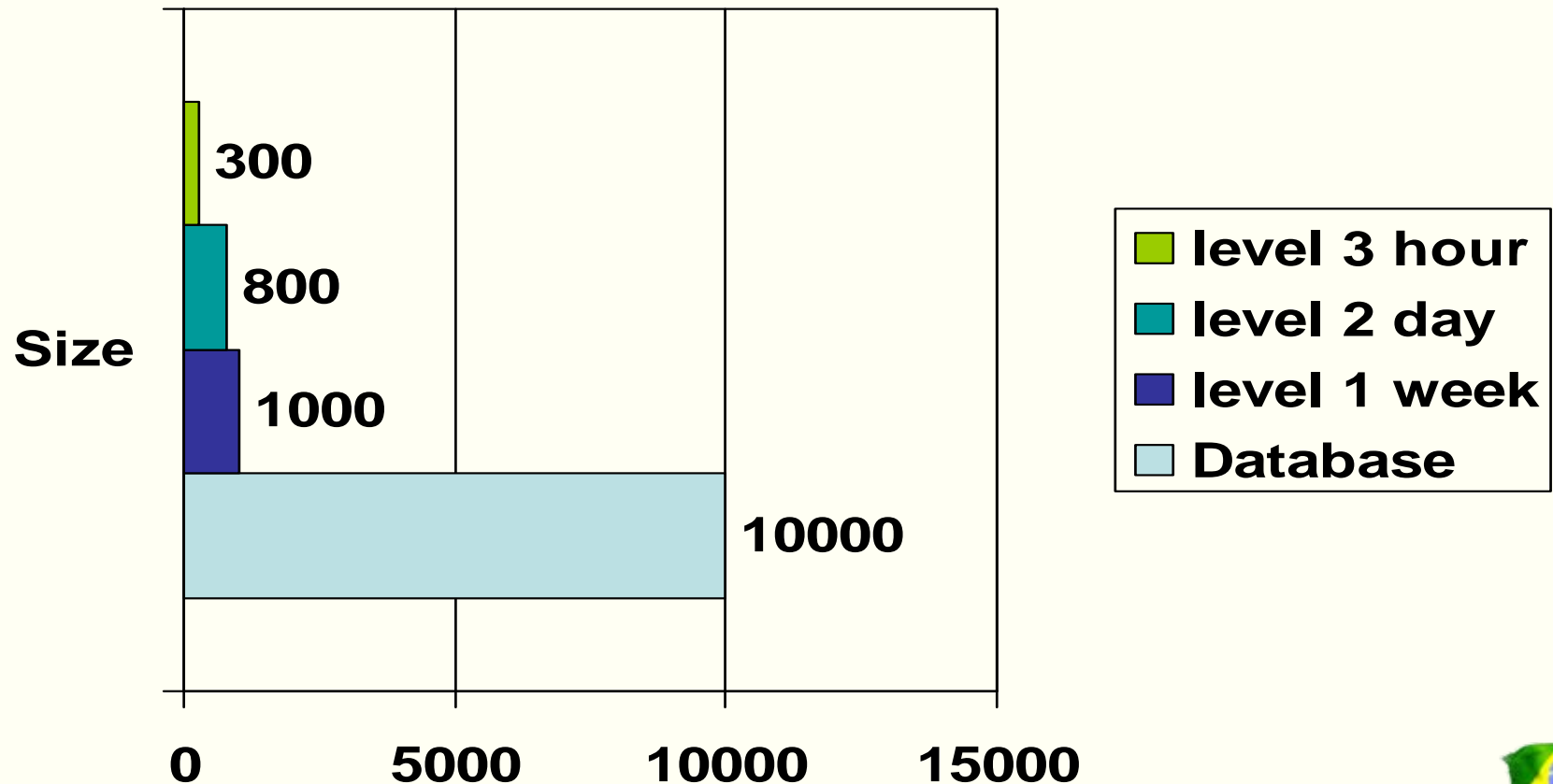
- 50 users, 10 hours per day, 68k transactions per day, accounting
- hourly nbackup – 1-2 minutes, total nbackups – 40gb (year)



NBackup sample 2



- 100 users, 12 hours per day, 224k transactions per day, stock
- hourly nbackup – 1-2 minutes





- extension of gbak (-d option)
- dump always increments "level 0" backup
- database dump is a "read-only" database, ready to use
- no dump "levels"
- dumps can be made contigiously
 - dump db to db_dump each hour
 - dump db_dump to db_dump2 each day
 - ...





- alternate methods of copying data
- extracting scripts
 - check how long scripts will be "returned back to the database"
- replication
 - may be the best, but needs additional hardware and expenses for the tools, triggers, etc.
- IBPump, or your own tools





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

