



# Firebird recovery: tools and approaches

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IBSurgeon

# About IBSurgeon



- Tools and consulting
- Platinum Sponsor of Firebird
- Founded in 2002: 9 years of Firebird recoveries and consulting
- Based in Moscow, Russia
- In Brazil – **Firebase.com.br**

[www.ib-aid.com](http://www.ib-aid.com)

[www.ibsurgeon.com](http://www.ibsurgeon.com)

# Team



## Our chiefs



## Our consultants



Yemanov



Khorsun



Peshkoff

Before we start –

I have a question.

How to drink 6 caipirinhas and do not  
go to call “Hugo”?



?

The answer will be in the end of  
presentation

# Agenda

1. Is Firebird reliable?
2. What happens when database crashes
3. Standard means to recover database
  - Tips
4. IBSurgeon tools
  - FBDataGuard approach
  - FirstAID approach
5. “Rodizio” offers for developers

**IS FIREBIRD RELIABLE?**



# Is database corruption a problem only for Firebird?

- All databases are corrupted:
  - MSSQL  
[www.google.com/search?q=MSSQL+database+corruption](http://www.google.com/search?q=MSSQL+database+corruption)
  - Oracle  
<http://www.google.com/search?q=Oracle+database+corruption>
  - MySQL, MS Access, DB2, Sybase, etc, etc (and InterBase)

# Corruption is a matter of statistics

- HDD fails
- RAM fails
- ...
- Automobiles fail
- Electronics fails
- Space shuttles fall

The same is for hardware  
& software combination  
we use with Firebird



# How to live in “corruptions” world?

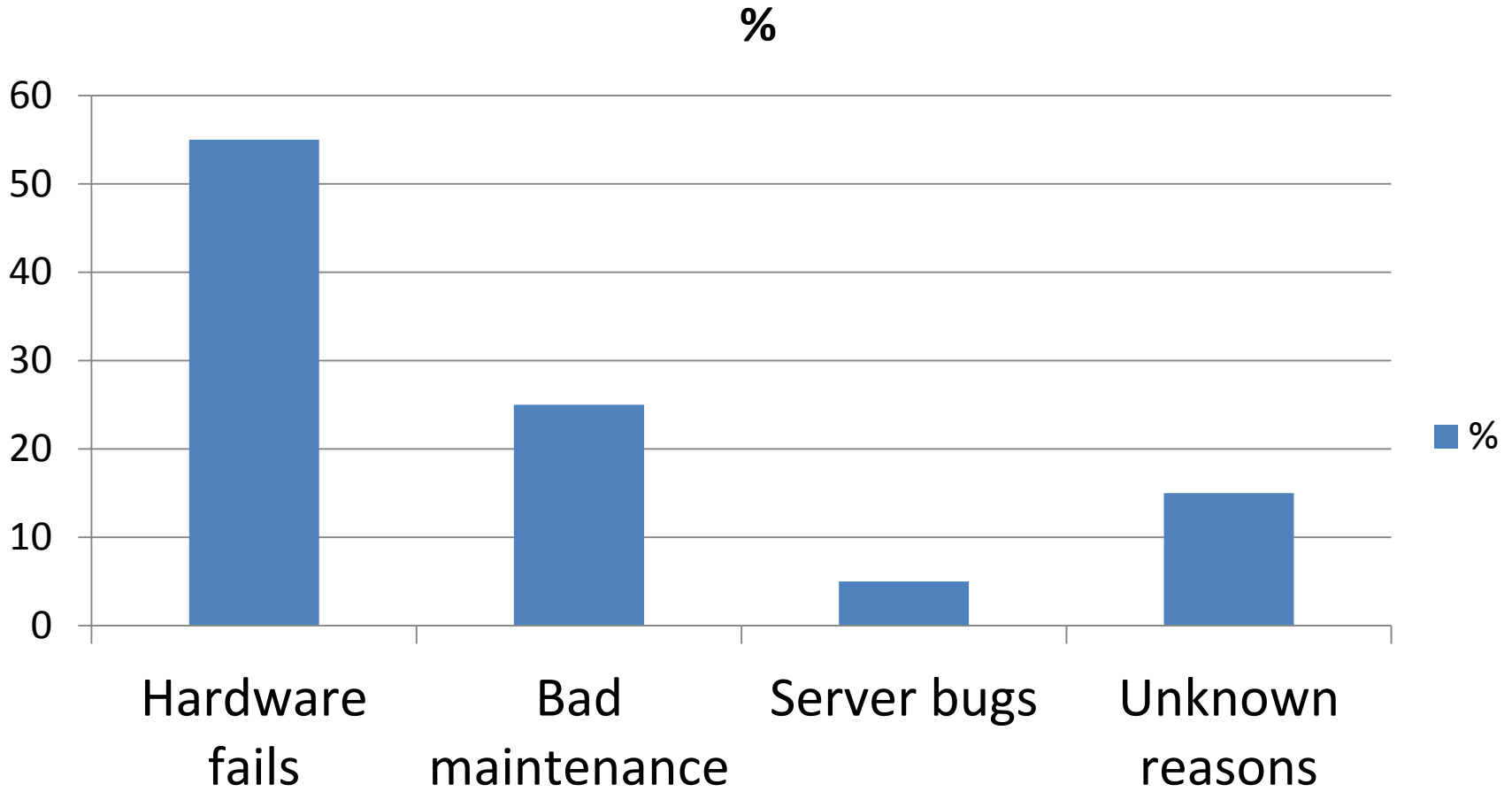
1. This is **impossible** to exclude (prevent) corruption at all (if you are not God)
2. Realistic approach is **to decrease the chance** of corruption – i.e., increase system stability,

Reliability levels are: 99%, 99.5%, 99,9%, 99.99%, etc

# Examples of reliability

- 99%
  - It's 3 days stop of your business (e.g., December 23-25 )
- 99,5%
  - About 1 day stop
- 99,9%
  - 3.5 hours stop
- 99,99%
  - 20 minutes

# Why Firebird corrupted?



# How to achieve 99,5% Firebird stability?

- Buy good hardware with RAID
- Perform backup/restore everyday

*It's much easier and cheaper to achieve 99,5% reliability for Firebird than for other databases.*

**Yes, Firebird is reliable!**

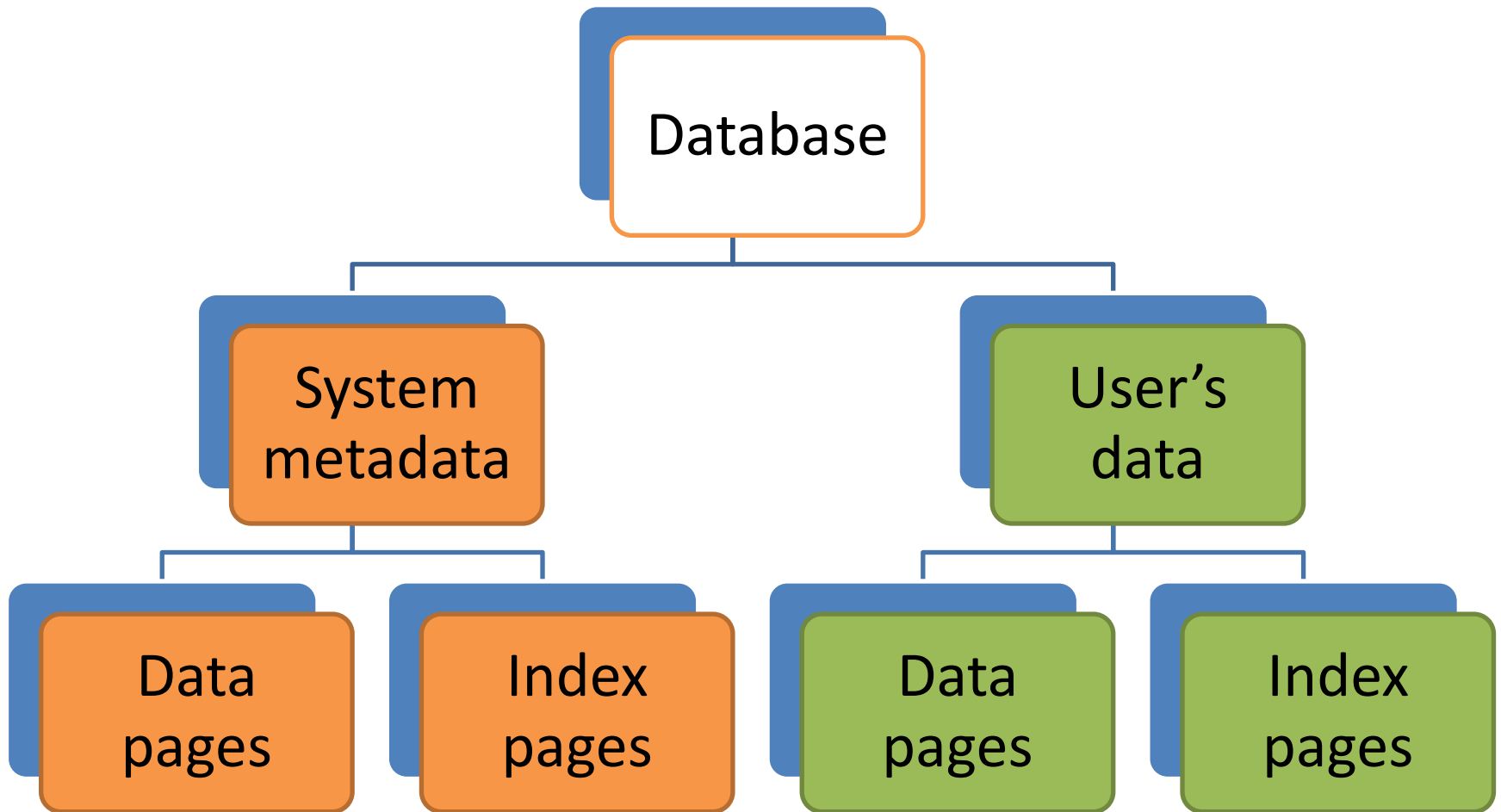
# But it happens...

- No backups
- No administrator
- Serious hardware fails
- Big database – can't do backup/restore everyday
- What to do?

**WHAT HAPPENS WHEN DATABASE  
CRASHES?**



# Firebird inside looks like a forest...



# ...with only 2 trees

- System data pages
  - Contains information about tables, indices, stored procedures. This information is used to read user data pages
- User data pages
  - Contains actual users data
- Indices?
  - Indices always can be recreated
  - System indices can be a problem

# What corruption means for Firebird?

- For some reason Firebird cannot read one or several pages
  - For HDD corruptions - many pages
  - RAM corruptions – few pages

Corruptions are shown:

1. Users screen (“internal Firebird software consistency check” error message)
2. In firebird.log

# Heavy and Easy corruptions

- Easy corruptions
  - Users data are corrupted (partially)
  - User's indices corrupted
- Heavy corruptions
  - System data are damaged (**We can't read users data!**)

**STANDARD MEANS TO RECOVER  
DATABASE**

# Standard way to recover

- Stop Firebird server.
- Make a copy of Firebird database.
- Start Firebird server and run the following commands:

**gfix.exe -v -full**

**gfix.exe -mend -ig**

**gbak -b -g -v**

- If backup completed successfully, restore database:  
**gbak -c -v -user SYSDBA -pass masterkey  
path\_to\_backup path\_to\_database**

# Tips

1. Try to run them all, even if gfix shows errors.
2. Always use switch **-ig** for gbak to ignore checksum errors
3. Always use switch **-g** for gbak to suppress garbage collection (and to workaround index errors)
4. Use **-v** switch to have detailed output

# Restore errors

- After fixing corruptions it's a often to see "**Cannot commit index**" error at restore step.
  - In Firebird 2.0 and later this comes as a warning and database will be not brought on-line
- 1) IBDataPump  
<http://www.clevercomponents.com/demo/datapump/IBPump.zip>
- 2) Create only metadata database
- gbak -c -m
- 3) Run IBDataPump and set partially repaired database as Source, and fresh empty database as target

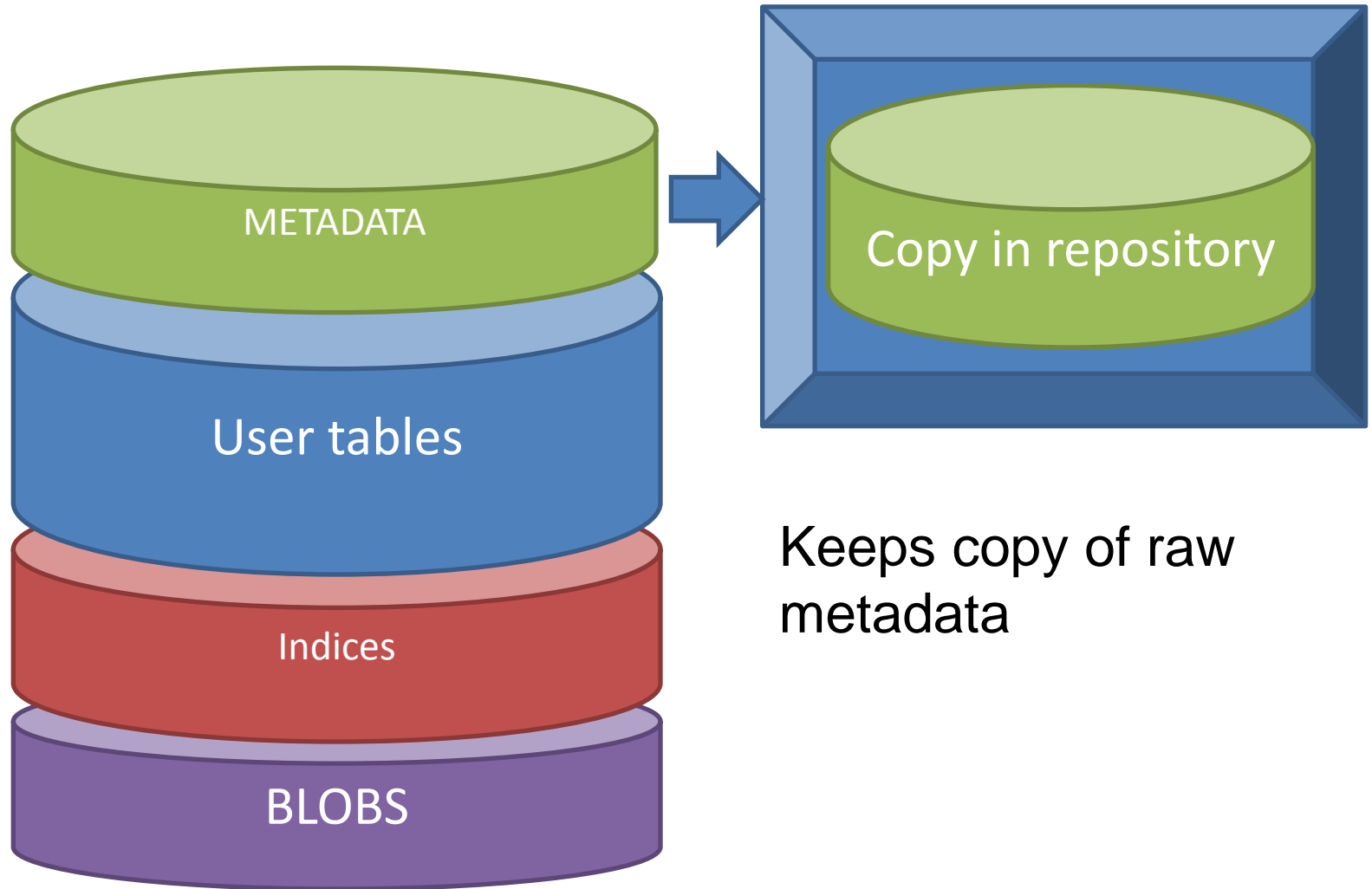


# Effectiveness

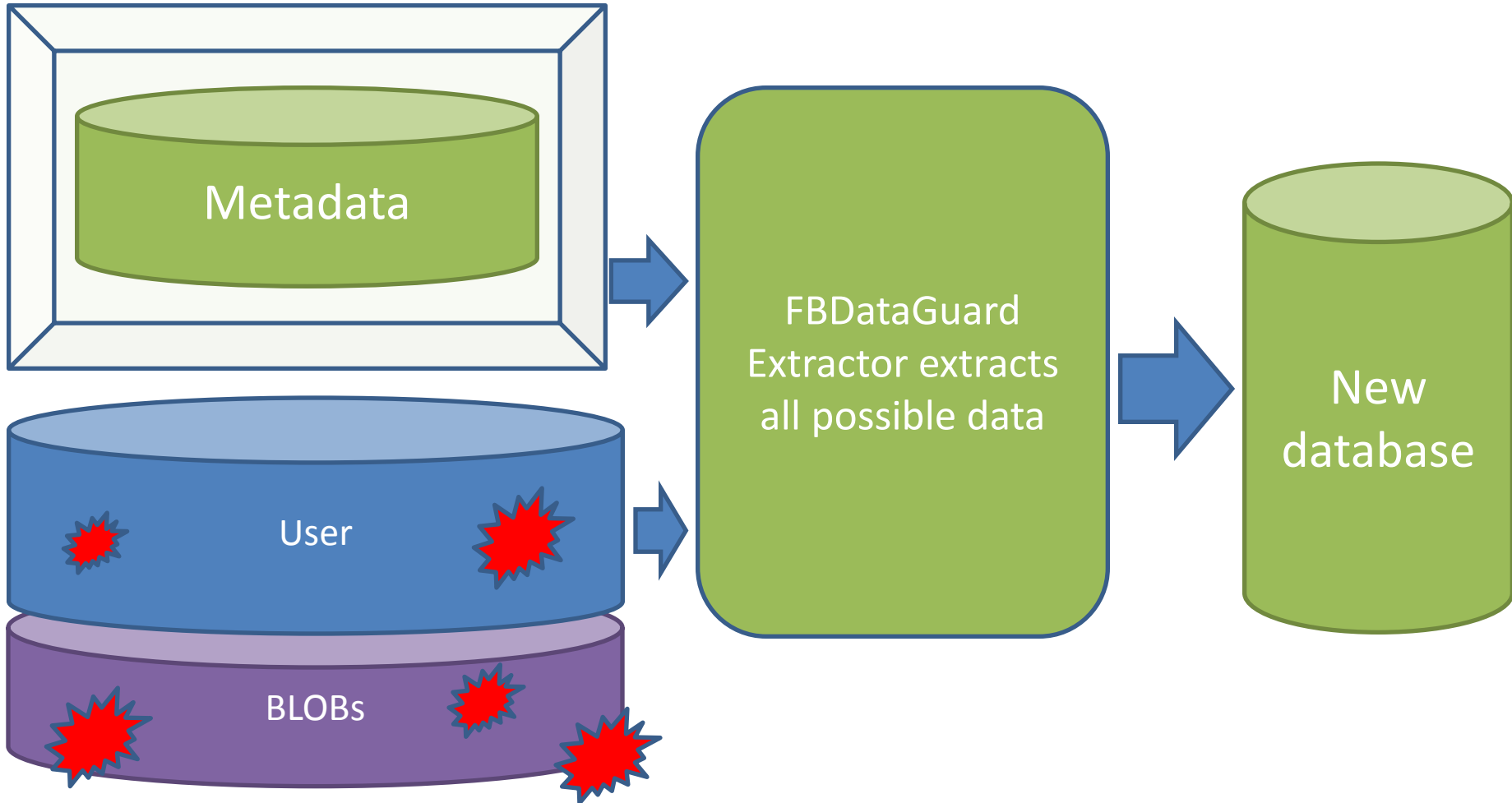
- Standard means can recover almost all easy corruptions
- What they cannot do:
  - Heavy corruptions with a lot of losses
  - System data corruptions

# **IBSURGEON TOOLS**

# Metadata repository



# FBDataGuard



# Demo

Up to 99% of successful recoveries!

# And also

- FBDataGuard does monitoring and health checks
- Backups and maintenance schedule
- 26 parameters to check
- Email alerts
- Web-console - DEMO

# FBFirstAID

- If we don't have copy of system metadata (i.e., FBDataGuard)
- Trying to recover data
- Must be combined with standard tools
- 3.0 version to be released at August 6!
- **Successful recovery chances – 80%**



# Answer

- Drink 1 caipirinha before drinking 6 others in 2 hours before. **It's always good to be prepared.**



2 hours



# “Rodizio” offers

- To protect databases we offer 1 year subscription to install as many as you need FBDataGuard instances
- This instances will run indefinitely (no restrictions)
- Should be activated
  - Silent bundle is also possible, requires signing VAR agreement

**Today - R\$600 (reg US\$1200)**

# Other “Rodizio” offers

- Optimization Pack for 1 year – R\$800
- FBScanner 3.0 with LogAnalyzer, IBAnalyst 2.7, IBTM 1.5

# Next presentation

- How to migrate 75Gb Firebird 1.5 to 2.5?
- 5000+ stored procedures, 500+ tables, 400 users and 24x7 workmode
- 16-25, **Sala Vermelha**
- **Mission Impossible, Part 4 (Starring Firebird!)**