



COLRUYT
GROUP





Housekeeping @ColruytGroup

Steven Goedertier
28/03/2019

Agenda

- Current Housekeeping process
- Ongoing experiment
- Other idea's and initiatives



Current Housekeeping process

2 different flows

- Daily flow
 - That should threat the objects that changed during the day
- Weekly flow
 - That will perform a complete housekeeping run on all database objects

General setup

- Everything needs to run in SHRLEVEL CHANGE
- Backups on TAPE & STACKED





Current Housekeeping process

Daily flow

INCREMENTAL
COPY

Incremental Copies

```
LISTDEF COPYLIST
  INCLUDE TABLESPACES DATABASE <db> ALL PARTLEVEL
  INCLUDE TABLESPACES DATABASE <db> ALL HISTORY PARTLEVEL
  INCLUDE TABLESPACES DATABASE <db> ALL ARCHIVE PARTLEVEL
COPY LIST COPYLIST
  CHANDELIMIT (ANY)
  SHRLEVEL CHANGE
  PARALLEL 1 TAPEUNITS 1
  COPYDDN (COPYDVSM)
```

Deprecated in V12

We take a full copy for every object that changed



Current Housekeeping process

Daily flow



RUNSTATS

Same principle as for the copy, we want to RUNSTATS everything that changed significantly

REXX program using SYSIBM.SYSTABLESPACESTATS.STATSTIME generating statements

```
RUNSTATS TABLESPACE <db>.<ts> PART <partno>  
TABLE ALL  
SHRLEVEL CHANGE HISTORY ALL
```

```
RUNSTATS INDEX ( <db>.<ix>)  
KEYCARD FREQVAL NUMCOLS 1 COUNT 20 BOTH  
FREQVAL NUMCOLS 2 COUNT 20 BOTH  
FREQVAL NUMCOLS 3 COUNT 20 BOTH  
FREQVAL NUMCOLS 4 COUNT 20 BOTH  
FREQVAL NUMCOLS 5 COUNT 20 BOTH  
FREQVAL NUMCOLS 6 COUNT 20 BOTH  
HISTOGRAM  
SHRLEVEL CHANGE HISTORY ALL
```

Also using include/exclude tables



Current Housekeeping process

Daily flow



REBIND

We want to REBIND everything that has updated statistics.

REXX program using `SYSIBM.SYSTABLESPACESTATS.STATSLASTTIME` generating statements

Also using include/exclude tables



Current Housekeeping process

Weekly flow - Saturday

FULL COPY

FULL Copies

```
LISTDEF COPYLIST
    INCLUDE TABLESPACES DATABASE <db> ALL PARTLEVEL
    INCLUDE TABLESPACES DATABASE <db> ALL HISTORY PARTLEVEL
    INCLUDE TABLESPACES DATABASE <db> ALL ARCHIVE PARTLEVEL
COPY LIST COPYLIST
    FULL YES
    SHRLEVEL CHANGE
    PARALLEL 3 TAPEUNITS 3
    COPYDDN(COPYWVSM)
MODIFY RECOVERY LIST COPYLIST DELETE AGE (105)
```



Current Housekeeping process

Weekly flow - Sunday

FULL COPY

REORG

REORG

View point: Sunday is very calm with almost no business processes during the day.
A lot of “spare” CPU-cycle → REORG whatever we need

REXX selecting based on:

- Amount of rows
- Amount of DML
- Amount of extends
- Clustering ratio & unclustered inserts
- If it wasn't reorged in the last 2 months

Also using include/exclude tables



Current Housekeeping process

Weekly flow - Sunday

FULL COPY

REORG

REORG TS & LOB

```
REORG TABLESPACE LIST REORGLST
SHRLEVEL CHANGE
LOG NO
KEEPDICTIONARY
DEADLINE CURRENT TIMESTAMP + 8 HOURS
MAPPINGTABLE CDPDBA1.MAPPING_TABLE
MAXRO 240 LONGLOG DRAIN DELAY 900
STATISTICS TABLE (ALL) INDEX (ALL) HISTORY ALL
KEYCARD FREQVAL NUMCOLS 1 COUNT 20
      FREQVAL NUMCOLS 2 COUNT 20
      FREQVAL NUMCOLS 3 COUNT 20
COPYDDN COPYWVSM
```

REORG Catalog & Directory every 3 months during maintenance window



Current Housekeeping process

Weekly flow - Sunday

FULL COPY

REORG

REORG INDEXES

```
REORG INDEX LIST REORGLST
  SHRLEVEL CHANGE
  SORTDEVT 3390
  DEADLINE CURRENT TIMESTAMP + 8 HOURS
  MAXRO 240 LONGLOG DRAIN DELAY 900
  STATISTICS HISTORY ALL
  KEYCARD
    FREQVAL NUMCOLS 1 COUNT 20
    FREQVAL NUMCOLS 2 COUNT 20
    FREQVAL NUMCOLS 3 COUNT 20
```





Current Housekeeping process

Weekly flow - Sunday



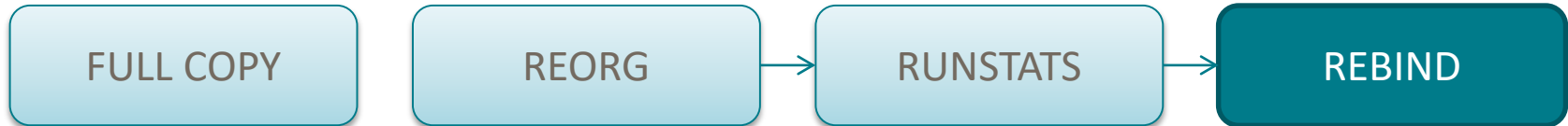
RUNSTATS

Everything that wasn't REORGed



Current Housekeeping process

Weekly flow - Sunday



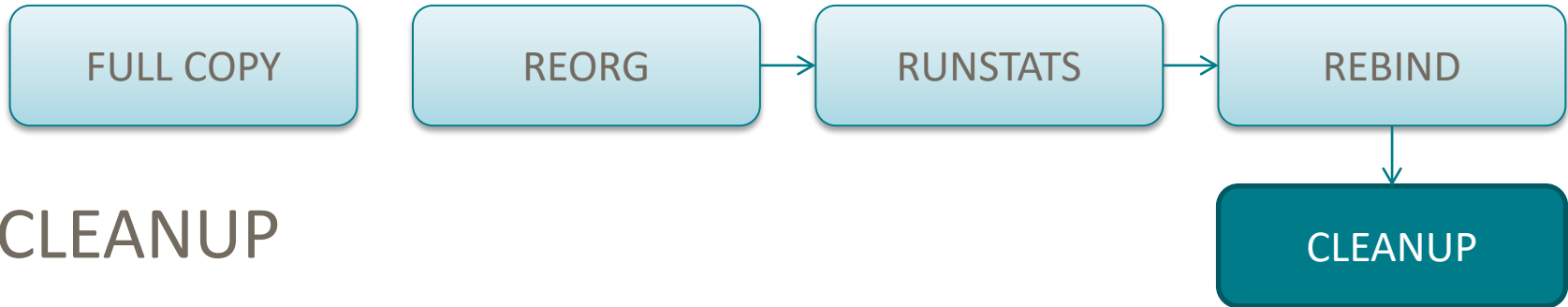
REBIND

Everything that was REORGed or RUNSTATSed



Current Housekeeping process

Weekly flow - Sunday



CLEANUP

Cleanup all plan tables for package versions we no longer have.

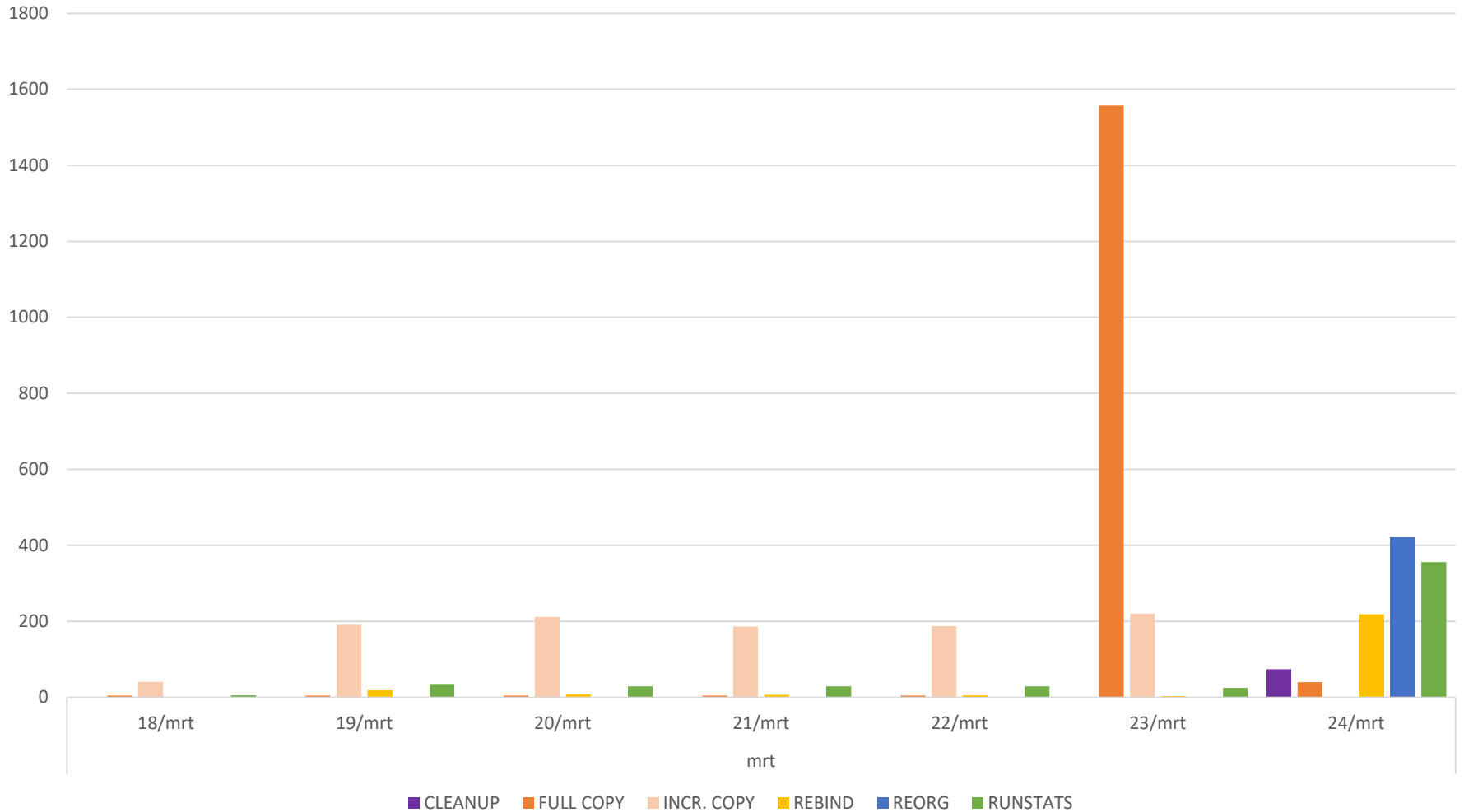




Current Housekeeping process

CPU overview

CPU overview Utilities



Agenda

- Current Housekeeping process
- Ongoing experiment
- Other idea's and initiatives



Ongoing experiment

Intent: Instead of starting the daily flows on a fixed time, we want to run housekeeping when an object is no longer in use, and before our batch window starts

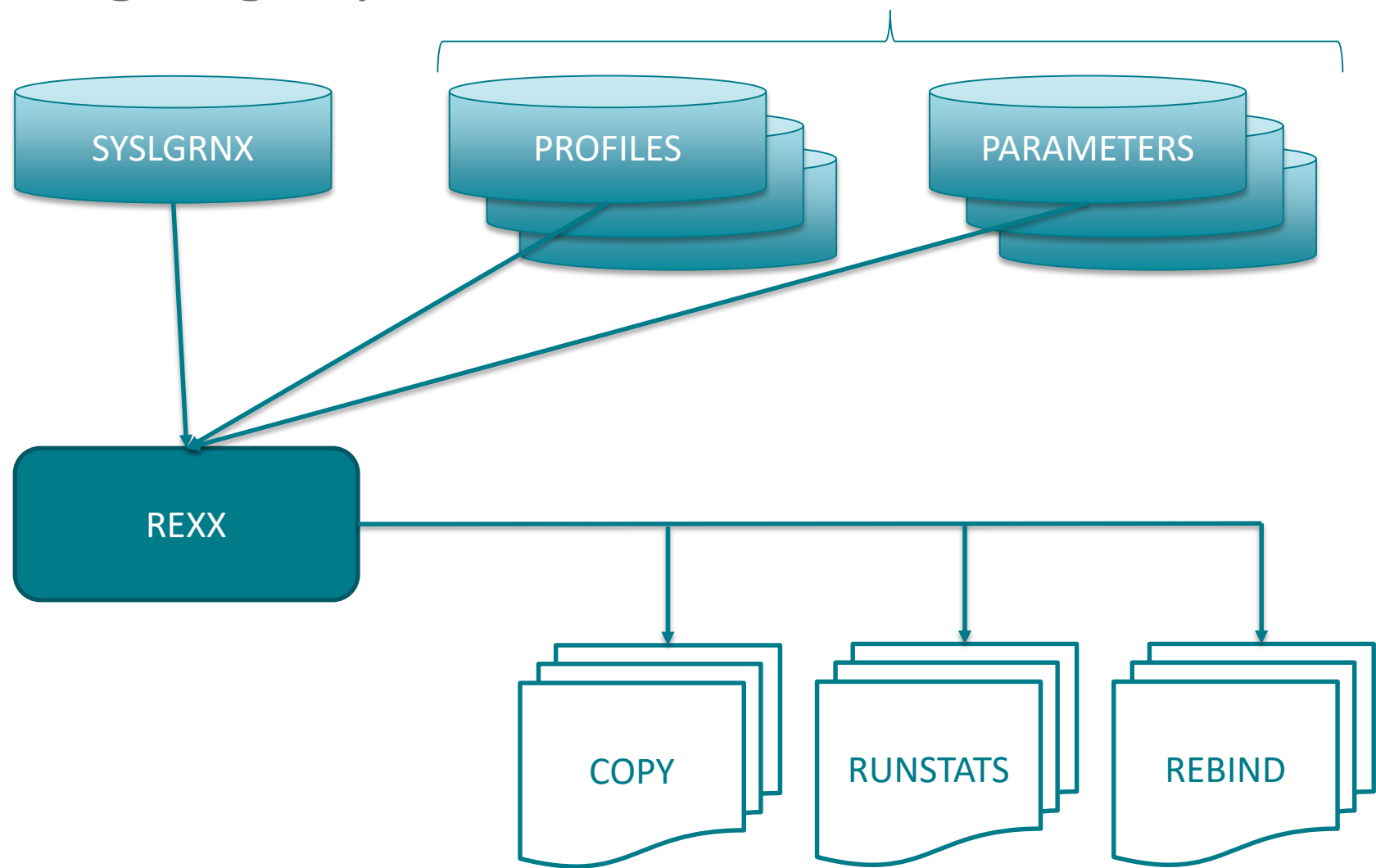
Logic written during internship, that estimates when a object is likely to be open, based on 4 weeks of data in SYSLGRNX.





Ongoing experiment

Per UTILITY type



REXX generates all jobs for all databases and schedules them.



Agenda

- Current Housekeeping process
- Ongoing experiment
- Other idea's and initiatives



Other idea's and initiatives

1. We need to get rid of CHANGELIMIT

- A. REXX
- B. DSNACCOX → are we then changing all REXX programs?
- C. Other?

2. We know that some objects might benefit from a REORG during the week and want to be able to tackle this in our daily runs.

Including accounting info, checking on increase in getpages?
→ lots of effort, worth the cost?

3. Flash COPY

4. DB2 V12 features

- 1. REORG – remove empty partitions → issue when copying data to lower environments
- 2. RUNSTATS – New keyword: REGISTER
May avoid GBP dependency
- 3. MODIFY RECOVERY – New keyword: DELETEDS
In addition to erasing the recovery information from SYSCOPY & SYSLGRNX the backup datasets are also deleted

