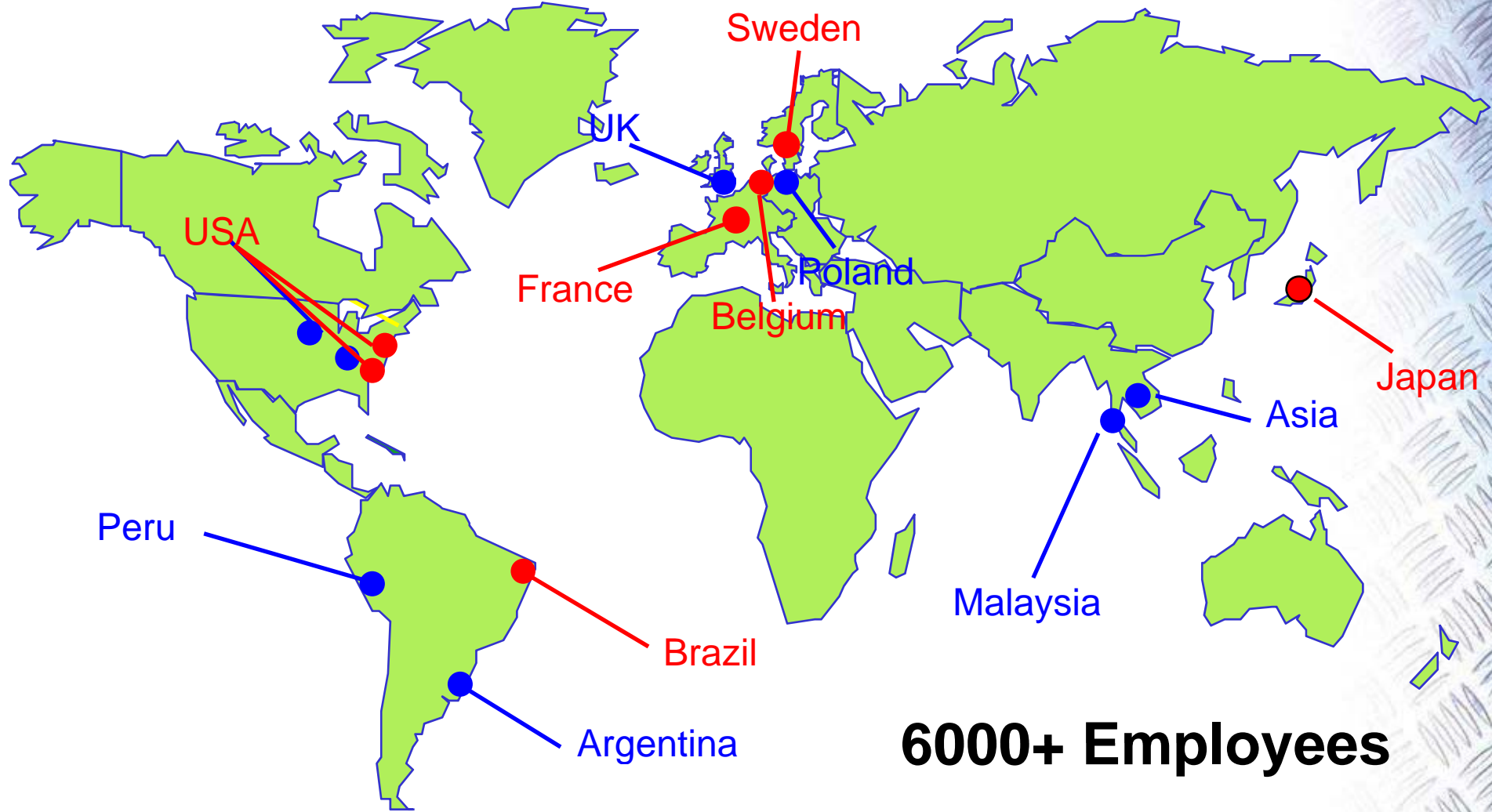


Mainframe at Volvo IT

Major locations



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6000+ Employees

Introduction

Volvo Customers

- **Volvo Trucks, Renault Trucks, Mack Trucks, Volvo 3P, Volvo Powertrain, Volvo Penta, Volvo Buses, Volvo Construction Equipment, Volvo Logistics**

External Customers

- **Volvo Cars, SCA, Logica, ABB, Skandia, H&M, ElektroSkandia SPV, Gothenburg City**
- **Banque Accord (Fra), Picanol (Bel)**

Locations

- **Sweden, USA, France, Belgium, Brazil, Japan**

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Some facts

- **HW**
 - - 2 pc z10 EC40, 6 zIIP, 3 zAAP, 4IFL
 - - ~1600 MIPS installed
 - - 352 GB Memory
 - - ~60 LPARs

- **DB2 V9**
 - - 113 DB2 systems
 - 56 for Volvo
 - 43 V9 NFM
 - 13 V9 CM
 - 57 for external customers
 - 45 V9 NFM
 - 12 V9 CM

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more facts

- DB2 V9 GA March 2007
- IDUG NA May 2008 only a few customers had DB2 V9 installed, most still in CM. New features were still seldom used.
- First installation at Volvo June 2008
- In average 4 months between CM and NFM
- Normally we apply PTF's 2 times a year
we had to do this more often due to problems in DB2 and in ISV-tools

Some of the problems we had

- Major incident in October 2008
Wrong output in pay-roll application
Roll-out of V9 stopped for about 3 months
- Several times system down
reason: problems with parallelism
(DEGREE ANY – DEGREE 1)
- 20% CPU increase for one of our external customers
 - ZPARM parameter EDM_SKELETON_POOL (default 5120 kb)
 - More buffers for BP8K01 (increased I/O on DSNDB01.SPT01)
- Some of the V9 features were not supported by ISV-tools

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Actions taken

- Rebind all packages
(forced to do this due to parallelism problems)
- Volvo IT took the risk to skip “PLAN STABILITY”
(one of our external customers implemented this feature with success)
- recommendation of IBM:
 - rebind on the new release to get the best performance
(but this is not always the case)
 - save old access paths

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Actions taken

■ DSNDB07 Changes

- More and larger 32k tablespaces
- No 8k and 16k tablespaces
- Larger 32k buffer pool
- Tablespaces are created without secondary allocation
 - 4k and 32k workfiles are used for work (order by, distinct, sort) and for temporary tables
 - 4k workfiles are only used for small records: due to the limitation of 255 rows per page, the use of 32k workfiles for small records would result in a waste of space
 - 8k and 16k are only used for temporary tables
 - if no 8k and 16k workfiles exist, 32k is used

Actions taken

- Altered the number of implicitly created databases

default was 60.000

new default is 10.000

Alter sequence SYSIBM. DSNSEQ_IMPLICITDB maxvalue 10

Optimizer in V9 is more sensitive to statistics

We take more detailed statistics

```
RUNSTATS TABLESPACE XXXXXX.XXXXXXXXXX
  SHRLEVEL(CHANGE) TABLE(ALL)
  INDEX (ALL KEYCARD
  FREQVAL NUMCOLS 1 COUNT10    FREQVAL NUMCOLS 2 COUNT10
  FREQVAL NUMCOLS 3 COUNT10    FREQVAL NUMCOLS 4 COUNT10
  FREQVAL NUMCOLS 5 COUNT10    FREQVAL NUMCOLS 6 COUNT10
  FREQVAL NUMCOLS 7 COUNT10    FREQVAL NUMCOLS 8 COUNT10
  FREQVAL NUMCOLS 9 COUNT10    FREQVAL NUMCOLS 10 COUNT10)
```

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No migration topic, but very useful

Index on Expression

```
UPDATE NP.TNP80020
SET KSTATUS = :H ,
TSPROCES = CURRENT TIMESTAMP
WHERE NRECORD > :H
    AND KSTATUS = ''
    AND KRECORD = 'P110'
    AND SUBSTR ( RRECBP , 2 , 5 ) = :H
    AND SUBSTR ( RRECBP , 7 , 10 ) >= :H
    AND SUBSTR ( RRECBP , 24 , 4 ) = :H
```

```
CREATE INDEX NP.XNP80021
ON NP.TNP80020
(SUBSTR(RRECBP,2,5),SUBSTR(RRECBP,24,4), SUBSTR(RRECBP,7,10) ASC )
```

	elapsed time	cpu time
Before index	01:02:51.883763	14:01.502761
After index	00:00:57.062964	00:09.593658

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Testing

- **Compression of DSNDB01.SPT01**

Useful if package stability is used (multiple copies of a package)

Maximum size of SPT01 is 64GB

ZPARM: compress_spt01=yes

run Reorg utility

- **Use of RTS**

to trigger utility execution (Reorg, Runstats, Copy)

- **Use of Universal tablespaces**

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Lessons learned ?

- Wait a bit longer ?
- More education needed
- Lack of detailed V8 performance data
- More cooperation needed between DB2 system programmers and DBA's before and after migration

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