



## GEN r7.6 Upgrade – Experiences

Klaus Seeger, R+V



Who we are

## Overview of R+V in 2008



- ▶▶ R+V is the largest bank insurer in Germany
- ▶▶ R+V is **the** cooperative society insurer in Germany

Gross premiums without bonus and rebate provisions	€9.9 billion
Number of insurance contracts	19.6 million
Investments	€51.2billion
Employees	12,453

For more and detailed informations please visit us at :

**WWW.RUV.DE**

# Themes

**GEN r7.6–Upgrade–Experiences - Introduction R+V-Aspects**

GEN r7.6–Upgrade–Experiences - Mainframe

GEN r7.6–Upgrade–Experiences - Distributed Application

# GEN r7.6-Upgrade-Experiences – Introduction R+V-Aspects

## GEN at R+V

In use since:	Version
10/1995	Start with IEF 5.3
In 1996	Upgrade to Composer 3
In 1998	Upgrade COOL:Gen 4.11
In 1999	Upgrade to COOL:Gen 5.1 and usage of the OpenServer-Package Parallel operation of 4.11 toolset until end of 2001
01/2003	CE-Upgrade to Cool:Gen 6.0e
06/2003	Toolset-Upgrade to Cool:Gen 6.0e Parallel operation of the 5.1/5.0 toolset to support OS/2
01/2005	Upgrade to Gen 6.5-CE
07/2005	Upgrade to Gen 6.5-Toolset
11/2008	Upgrade to Gen r7.6-CE und Toolset

## Klaus Seeger at R+V

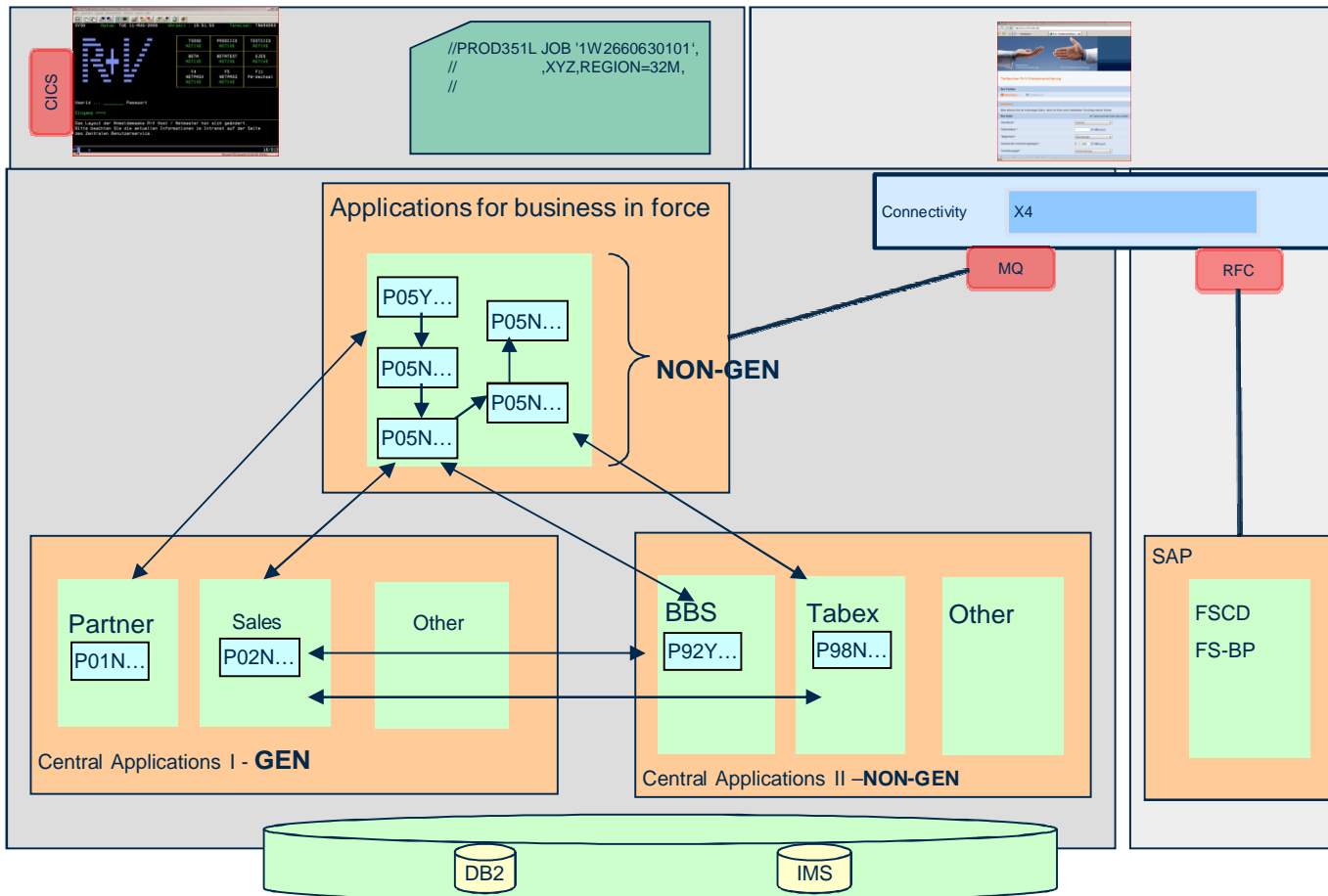
Position and Activities	
07/1991 - 04/1996	Mainframe-developer financial services and encashment
In 1994/1995	Member of the R+V-IEF-Mainframe-Evaluation-Project
03/1996 - 01/2001	Member of the IEF/GEN-project "RUVISPC" (R+V sales support system) in several roles
Since 02/2001	Member of the R+V GEN-infrastructure-support

R+V has been using Gen and several of the predecessor-versions since 1995 and each upgrade process was marked by its own characteristics combined with new experiences.

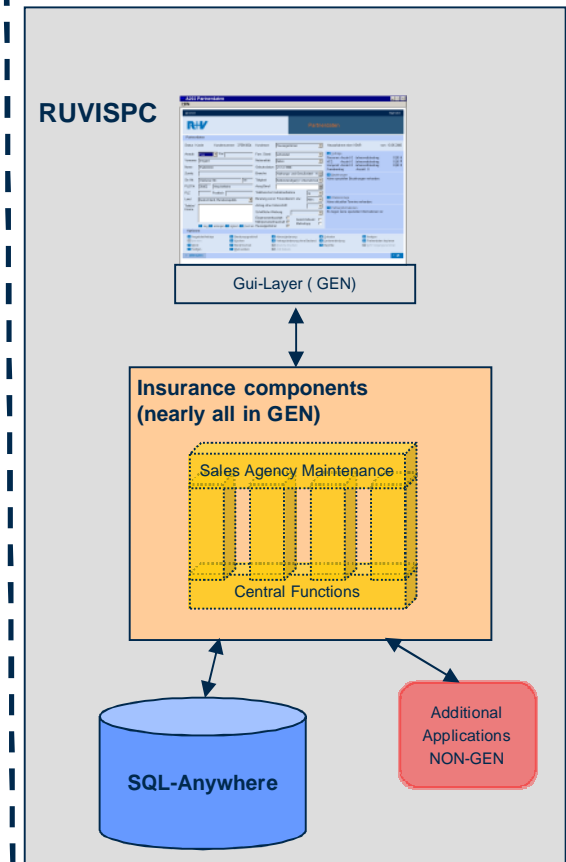
# GEN r7.6-Upgrade-Experiences – Introduction R+V-Aspects

What kind of experiences can we share with you (a simplified picture):

## GEN in Mainframe Applications on z/OS



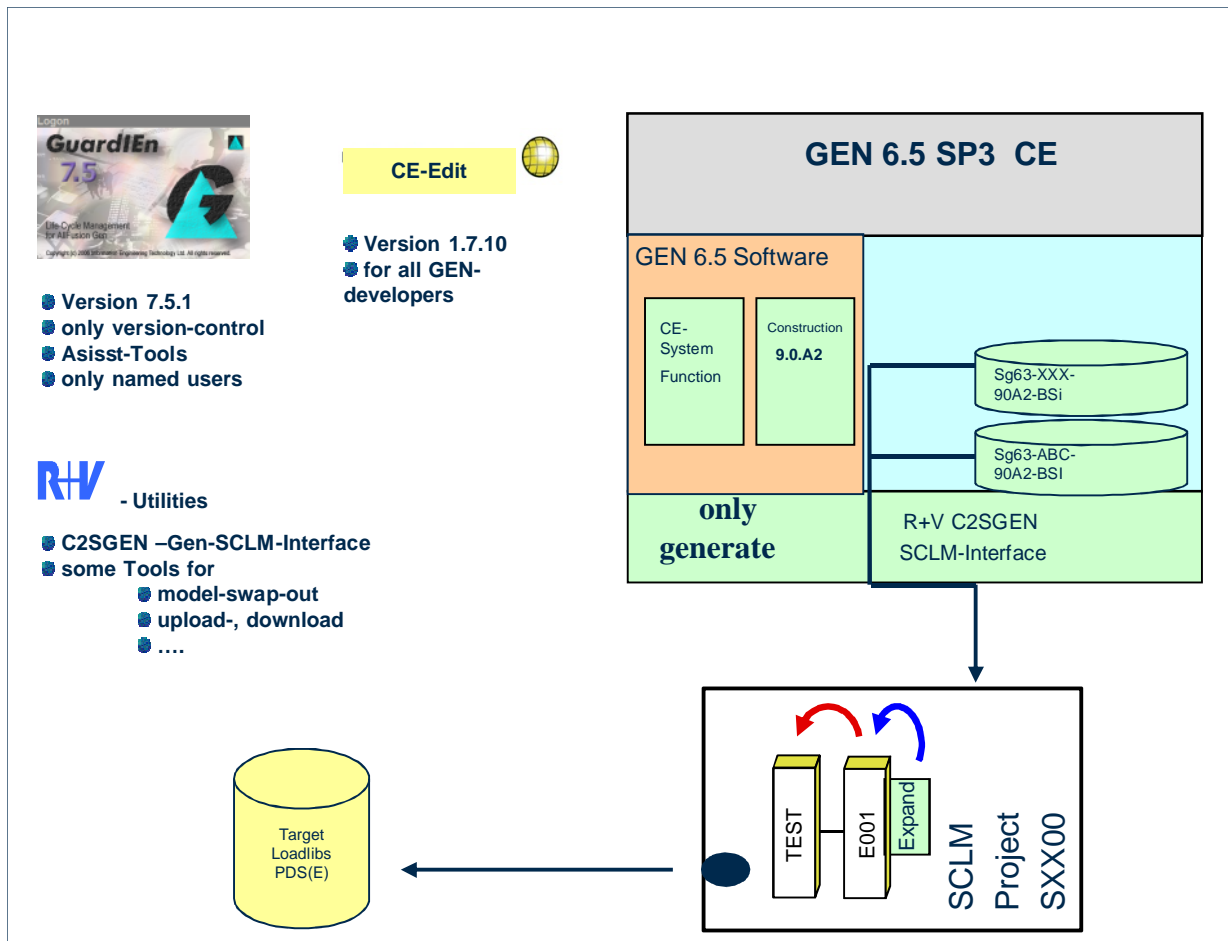
## GEN in a distributed Application under Windows



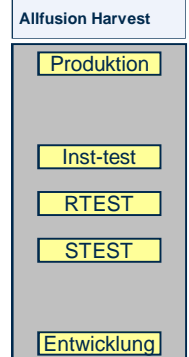
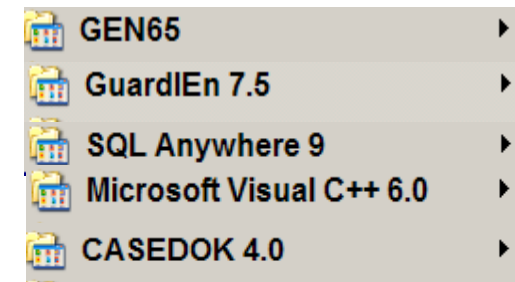
# GEN r7.6-Upgrade-Experiences – Introduction R+V-Aspects

Where did we start from.....

R+V-Gen-Environment until end of November 2008



Gen-6.5 developer-WS on WIN-XP



# GEN r7.6-Upgrade-Experiences – Introduction R+V-Aspects

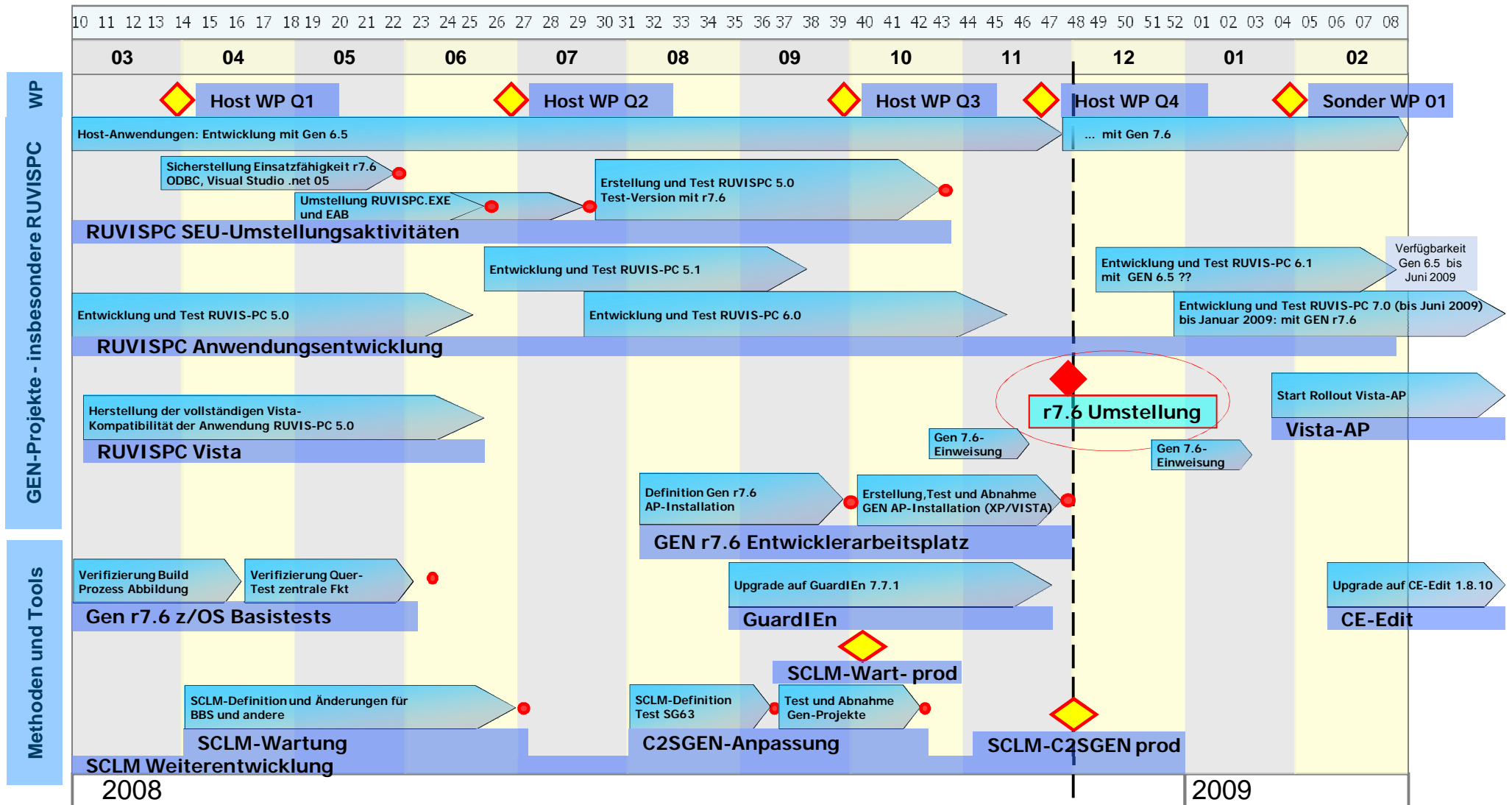
What kind of dependencies and challenges did we had to take into account for the upgrade planning:

- ▶▶ **R+V internal stuff**
  - ▶▶ maintenance cycles
    - the mainframe application maintenance cycles are defined for each quarter
    - the RUVISPC application has a different maintenance cycle of two times a year
  - ▶ special restrictions during the annual statement (frozen-zone)
  - ▶ defined upgrade to Windows Vista at R+V being finalized at the end of July 2009
- ▶▶ **GEN related aspects**
  - ▶ Conversion of GEN related Loadlibs to PDSE's
  - ▶ Definition of the new Gen developer workstation
    - necessary and self-defined upgrades of basic components (Visual-Studio, GuardIEn...)
  - ▶ Definition of the upgrade-type and the usage of the compatibility feature
  - ▶ Preparation and examination of technical changes caused by the upgrade
    - Necessary changes to the R+V-SCLM-Interface (C2SGEN)
    - Changes to distributed applications caused by the upgrade to Visual-Studio .net
    - Substitution of „embedded-sql“ by the use of ODBC to connect to SQL-Anywhere

→ → → this leads us to the following idea of a plan.....

# GEN r7.6-Upgrade-Experiences – Introduction R+V-Aspects

Just to give an idea – not translated





# Themen

GEN r7.6–Upgrade–Experiences - Introduction R+V-Aspects

**GEN r7.6–Upgrade–Experiences - Mainframe**

GEN r7.6–Upgrade–Experiences - Distributed Application

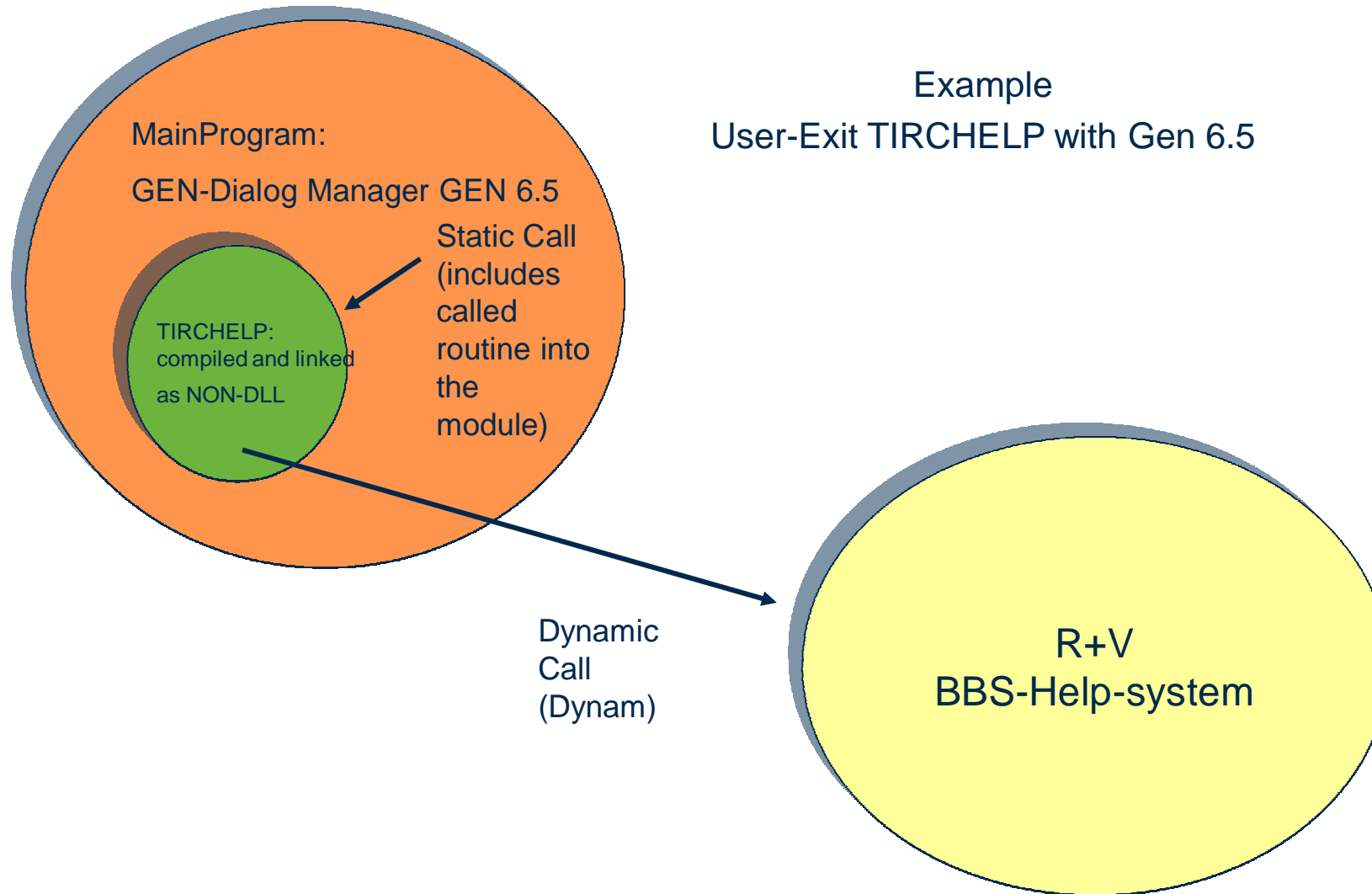
# GEN r7.6-Upgrade-Experiences – Mainframe

## Activities and decisions to prepare the mainframe-upgrade - I

- ▶▶ **Conversion of loadlibs to PDSE**
  - ▶ because of the long running discussion about GEN-z/OS-DLL's we had enough time to prepare and release the conversion in advance. We then used PDSE's in our productive environments before GEN was upgraded and we had no problems so far..... but... later...
- ▶▶ **Decision to use the r7.6-compatibility feature as much as possible**
  - ▶ DLL's are only used when the usage can't be avoided
  - ▶ no investigations to build an R+V-DLL-wrapper
  - ▶ no application re-generation should be triggered by the GEN-Upgrade
- ▶▶ **Implementing the necessary GEN-User-exits for r7.6**
  - ▶ in r7.6 user-exits are part of the runtime-dll
  - ▶ decision to write simple user-exit-wrapper to re-use the old non-dll exits

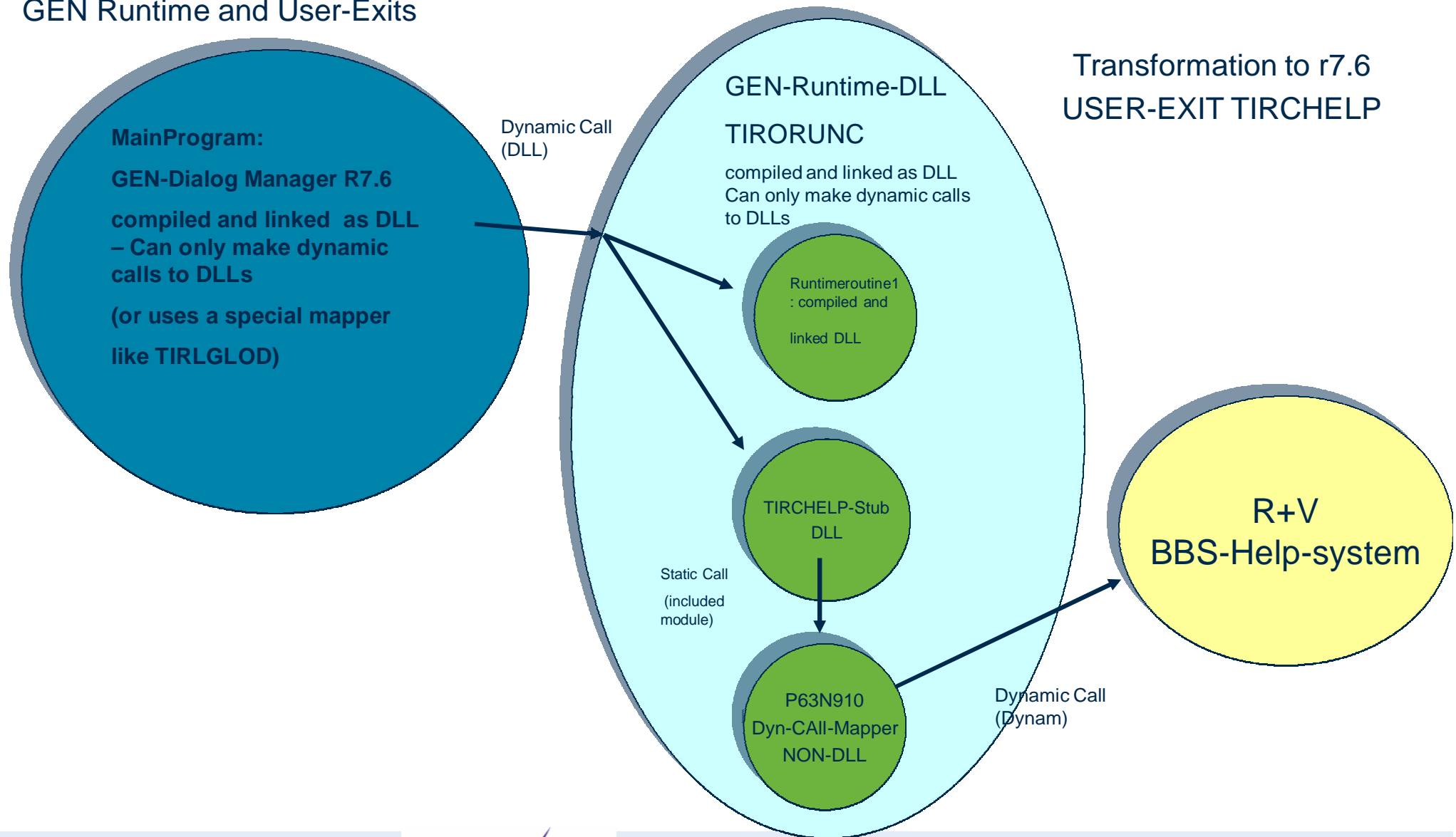
# GEN r7.6-Upgrade-Experiences – Mainframe

## GEN Runtime and User-Exits



# GEN r7.6-Upgrade-Experiences – Mainframe

## GEN Runtime and User-Exits



# GEN r7.6-Upgrade-Experiences – Mainframe

## Activities and decisions to prepare the mainframe-upgrade - II

- ▶▶ Definition of a deployment-process for the new GEN runtime-dll's
  - ▶ possible conflict-situations to other GEN-applications (for instance GuardIEn?) delivering their own runtime
  - ▶ possible conflicts with different versions of GEN runtime-dll's (for instance test of PTF's)
- ▶▶ Adjustment of the R+V-Utilities to GEN r 7.6
- ▶▶ Decision to upgrade the CE „IN-Place“
  - ▶ Preparation and test of the upgrade-process with a Test-CE
  - ▶ Decision to omit a CE-cleanup this time
- ▶▶ Definition of the necessary model-management activities
  - ▶▶ which models must be converted to the new schemal-level after the CE-Upgrade
  - ▶▶ which models are to be archived, to be deleted and/or to be swapped out
- ▶▶ No (productive) parallel-operation of GEN 6.5 and GEN r7.6 CE-software
- ▶▶ Adaption of the CE-build-process and the GEN-SCLM-interface (C2SGEN)
  - ▶ no Compile, Link und Bind by GEN → change of the relevant ISPF-Panels, Clist's, Skeleton's etc. to call the C2SGEN-interface
  - ▶ Definition of the new SCLM-method for DLL's to enable the compile und link of DLL's
  - ▶ Use of the COBOL-DB2-Coprocessor in the SCLM-Build process for GEN
  - ▶ Definition of the needed GEN-runtime-include-member for the SCLM-Build-Process
  - ▶ Determination of the „allowed“ GEN-Generation-parms and the GEN LINK-Flag-Defaults
  - ▶ Adaption of the C2SGEN-Scan-Processes to figure out the GEN r7.6-objects and to allow the automated adaption of the affected SCLM-project-architecture

# GEN r7.6-Upgrade-Experiences – Mainframe

## GEN-CE-Construction – Generationoptions Business-System-level – Target-Environment Parameters-

Specify Target Environment Parameters

COMMAND ===>

Operating System . . . . .	MVS_____	(MVS)
Generated Source Language . . . . .	COBOL____	(COBOL)
Database Management System . . . . .	DB2_____	(DB2,Datacom)
TP Monitor . . . . .	CICS_____	(CICS,IMS,IEFAE)
Screen Format Type . . . . .	BYPASS__	(BYPASS,MFS,MFS/EOF,HSTFAC)
Profile Type . . . . .	SQL	
Extended Attribute Support . . . . .	YES	
Enforce DM Constraints . . . . .	NO_	
Optimize import view initialization	YES	
Restartable Application . . . . .	YES	
Clear Screen Default Command . . . . .	RESET__	(RESET,RESTART)
DB2 Subsystem . . . . .	DB2T	(DB2 only)
Datacom MUF Name . . . . .	_____	(Datacom only)
Dynamically link procedure steps . .	NO_	(YES, NO, CMP)
Dynamically link action blocks . . .	CMP	(YES, NO, CMP)
Dynamically link screen managers . .	NO_	(YES, NO, CMP)
Pseudoconversational Support . . . .	YES	(CICS only)
Handle CICS Command Abends . . . . .	YES	(CICS only)
XCTL for flows when possible . . . .	YES	(CICS only)

Regarding our C2SGEN-interface we had basically defined that

- ▶ Manager-Modul, Procedure-Step (und Screen) are statically linked together as one DLL. A change in one of these objects should trigger a regeneration of all three objects.

GEM76016:

A new feature makes sure that Procedure Steps, Screens and Action Blocks are statically linked to the manager.

- ▶ Action Blocks are generated and linked as dynamically called compatibility modules
- ▶ the dynamic-link-flag has to be set on business-system-level and not on object-level (DEF)

Dynamically link procedure steps . .	NO_	(YES, NO, CMP)
Dynamically link action blocks . . .	CMP	(YES, NO, CMP)
Dynamically link screen managers . .	NO_	(YES, NO, CMP)

# GEN r7.6-Upgrade-Experiences – Mainframe

## GEN-CE-Construction – Construction Libraries

Specify Construction Libraries

COMMAND ===>

Model name . . : SG63-MUSTER-91A5-BSI-C2S

Business system : BS\_BEISPIEL

Select one of the options below, then press enter.

- \_ 1. Specify internal libraries
- 2. Specify external action block load libraries
- 3. Specify external action block DBRM libraries
- 4. Specify external system load libraries
- 5. Specify internal compatibility libraries
- 6. Specify external compatibility libraries

Note: The compatibility libraries are optional. They are only required when using the compatibility feature.

F1=Help F3=Exit F12=Cancel

We don't need a definition of additional compatibility libraries because of the usage of SCLM for the build-process.

A second reason is that the RI-triggers are only called on AB-level. This guarantees that the triggers are only statically linked to CMP-modules and therefore we can decide which objects are to be built as DLL's and which not.

GEM76016

NODLL and DLL NCAL modules will be stored in the same NCAL library. There should not be a need to define and allocate Compatibility NCAL library in the model.



- 5. Specify internal compatibility libraries
- 6. Specify external compatibility libraries

# GEN r7.6-Upgrade-Experiences – Mainframe

## GEN-CE-Construction – Generation Options

```
Generation Options for P63Y05D
COMMAND ===>

Select desired options, then press enter.

Generate debug support . . . . . Yes / No
Generate dialog manager . . . . . Yes / No
Process modules marked for Compatibility / Yes . No
Automatic installation . . . . . / Yes . No
Process in foreground . . . . . / Yes . No
Target TSO test facility . . . . . Yes / No
Remote installation . . . . . / Yes . No
Force include of all components . . . . . Yes / No

F1=Help F12=Cancel
```

From the GEN-point of view the compatibility-modules are the exception. From our point of view compatibility modules are standard, so we have always marked the flag to process compatibility modules.

There is a generator-check whether the defined dynamic link-flags fit to this option.

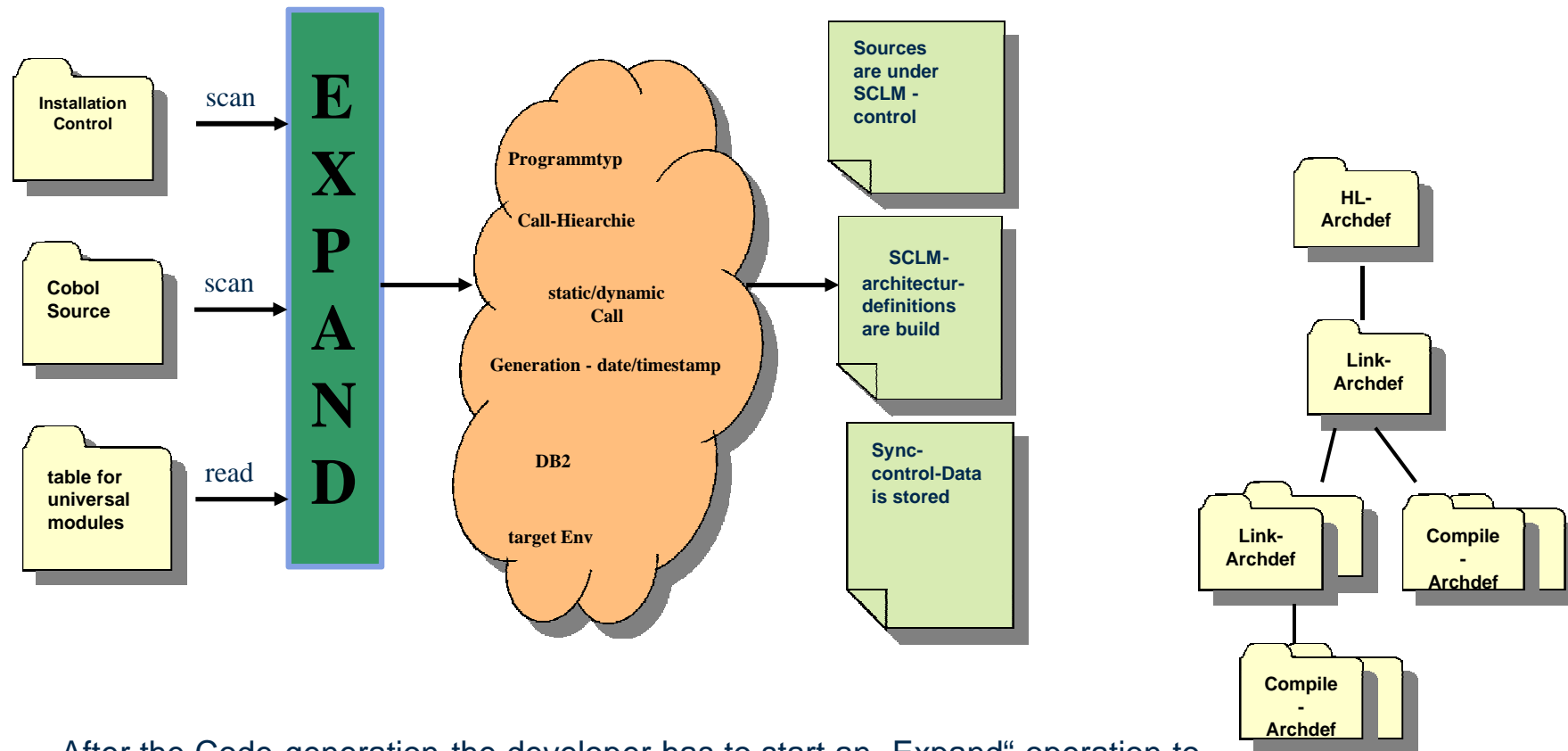
This check includes Foreign-AB's and the settings of the business-system which they belong too.

Process modules marked for Compatibility / Yes . No



# GEN r7.6-Upgrade-Experiences – Mainframe

## C2SGEN-interface – EXPAND



After the Code-generation the developer has to start an „Expand“ operation to migrate the business system changes to SCLM.

This operation generates the needed architecture for the modules in SCLM and saves the business system definitions and objects in SCLM

# GEN r7.6-Upgrade-Experiences – Mainframe

## C2SGEN-interface – EXPAND – changes coming with GEN r7.6

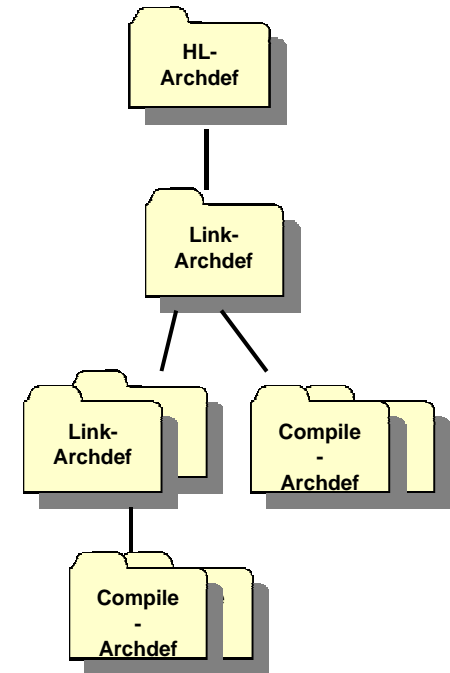
### New GEN-Runtime-Include-Member in the Link-Archdef's

```
000001 ***** MEMBER LP63Y05D
000002 LKED LKEDIC
000003 COPY $CCIC2DM ARCHDEF * ZUGELINKTE ICM_LINK_STATEMENTS
000004 INCL P63Y05D ARCHDEF * CC ARCHDEF : Dialog Manager
000005 INCL P63Y05P ARCHDEF * CC ARCHDEF : Procedure Step
000006 INCL P63Y05S ARCHDEF * CC ARCHDEF : Procedure Screen
000007 LOAD P63Y05D LOADCICS * AUSGABE CICS LADEMOMUL
000008 LMAP P63Y05D LMAPCICS * AUSGABE CICS LINK-LISTE
000009 ***** ENDE LP63Y05D
```

### Additional Compile-Parameter for DLL-Modules

- ▶ Manger-Modules
- ▶ Procedure-Steps
- ▶ Screens

```
000001 ***** MEMBER P63Y05D
000002 *==> Dialogmanager
000003 SINC P63Y05D COBOL * EINGABE SOURCE
000004 OBJ P63Y05D OBJCICS * AUSGABE OBJECT MODUL
000005 LIST P63Y05D COMPCICS * AUSGABE UMWANDLUNGSLISTE
000006 PARM1 DLL
000007 ***** ENDE P63Y05D
```



## GEN r7.6-Upgrade-Erfahrungen - Mainframe

everything taken into account?

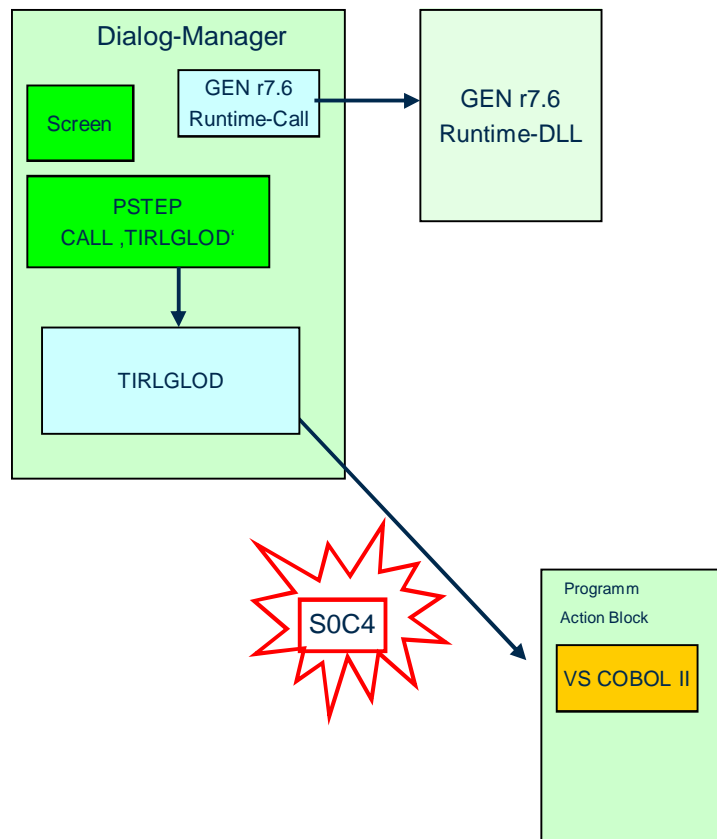
everything tested?



mondays after the upgrade.....

# GEN r7.6-Upgrade-Experiences – Mainframe

## VS COBOL II – Problem „S0C4 in a regenerated dialog“– NON-Trigger



In some of our 3270-blockmode applications we got S0C4-errors in CICS which we didn't encounter in our tests.

### AbendAID only shows an ASRA

An ASRA abend occurred in program CEECSPND.

The abending transaction was E109 running at terminal §00Q for user ID XV13231.

but in the CICS-Task-log CEEMSG we found:

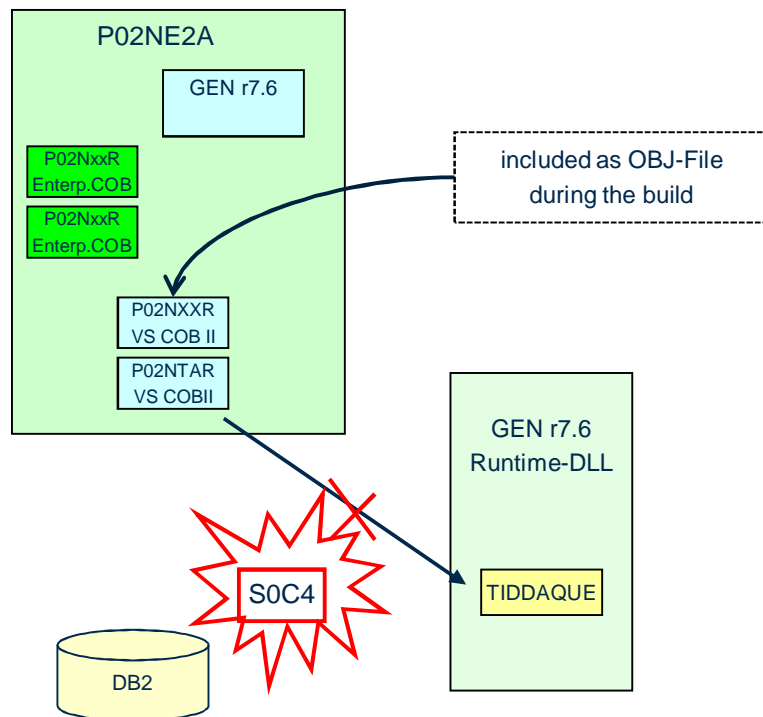
CEE3204S THE SYSTEM DETECTED A PROTECTION EXCEPTION (SYSTEM COMPLETION CODE=0C4) FROM COMPILE UNIT TIRLGLOD AT ENTRY POINT TIRLGLOD AT COMPILE UNIT OFFSET +00000134 AT ENTRY OFFSET +00000134 AT ADDRESS 1B2EE984.

With the help from support we could figure out that the abend-offset in TIRLGLOD (TIRLCLOD) was the „CALL/Branch“ to the AB and it was obvious that the called AB was an old one compiled and linked using VS-COBOL-II.

The IBM-COBOL-Migration Guide shows that some HL-Assembler-calls to COBOL-II are not supported. This is no Problem in Batch because there another „CALL“-Mechanism is used in TIRLGLOD (TIRLILOD) than in CICS.

# GEN r7.6-Upgrade-Experiences – Mainframe

## VS COBOL II – Problem „S0C4 calling a trigger from a regenerated AB (online and batch)“



In another application we also got an S0C4 but here we could figure out that an old COBOL-II-Trigger tries to call the new r7.6-TIDDAQUE-runtime-member

### typical error-message in online :

#### Abenaid:

An ASRA abend occurred in program P\*\*\*\*\*. The abending transaction was DCLJ running at terminal \$024 for user ID XV\*\*\*\*\*.

#### CEEMSG:

CEE3204S THE SYSTEM DETECTED A PROTECTION EXCEPTION (SYSTEM COMPLETION C ODE=0C4 FROM COMPILE UNIT TIDDAQUE AT ENTRY POINT TIDDAQUE AT COMPILE UNIT OFFSET +0002DE34 AT ENTRY OFFSET +0002DE34 AT ADDRESS 1AAB10C4.

### typical error message in batch:

A storage reference exception occurred during execution of program P\*\*\*\*\*. The expected completion code is S0C4.

CEE3204S THE SYSTEM DETECTED A PROTECTION EXCEPTION (SYSTEM COMPLETION C ODE=0C4 FROM COMPILE UNIT TIDDAQUE AT ENTRY POINT TIDDAQUE AT COMPILE UNIT OFFSET +0002DE34 AT ENTRY OFFSET +0002DE34 AT ADDRESS 1AAB10C4.

# GEN r7.6-Upgrade-Experiences – Mainframe

## VS COBOL II – Solution

### ▶ Trigger:

- ▶ There was no other way than to regenerate the COBOL-II-triggers and to rebuild the affected AB's
- ▶ we allow versioning for the Trigger-packages to reduce the regeneration effort (and to avoid SQL-RC -805-timestamp-errors)

### ▶ Online-Modules:

- ▶ Change of the Dynamic-Link-Flag-Defaults for Psteps (and regeneration and C2SGEN-change)

Dynamically link procedure steps . .	<b>NO</b>	(YES, NO, CMP)
Dynamically link action blocks . . .	<b>CMP</b>	(YES, NO, CMP)
Dynamically link screen managers . .	<b>NO_</b>	(YES, NO, CMP)



Dynamically link procedure steps . .	<b>CMP</b>	(YES, NO, CMP)
Dynamically link action blocks . . .	<b>CMP</b>	(YES, NO, CMP)
Dynamically link screen managers . .	<b>NO_</b>	(YES, NO, CMP)

This change forces the generator to generate a compatibility-call for the Pstep and within the PStep (now a compatibility module itself) all calls to TIRLGLOD are substituted by standard dynamic calls.

Dialog Manager

```
WHEN 'ADV_MENU'
CALL 'P02YI2P' USING
    RUNTIME-PARM1
    RUNTIME-PARM2
    GLOBDATA
    W-IA
    W-OA
END-EVALUATE
```



```
WHEN 'ADV_MENU'
CALL 'TIRLGLOD' USING P02YI2P-ID
    RUNTIME-PARM1
    RUNTIME-PARM2
    GLOBDATA
    W-IA
    W-OA
END-EVALUATE
```



GEM76016  
Now also possible for  
for Batch-Procedure-  
Steps

# GEN r7.6-Upgrade-Experiences – Mainframe

## Unknown change in a function

In some of our applications NON-GEN-systems are called via call-chains such as „GEN-AB calls GEN-EAB calls C-program“.

In special cases the C-program returns low-values as result of the operation which are mapped to the corresponding GEN-views.

In GEN 6.5 this special case could be examined with the statement

```
+-->IF length(trim(export xxx xxx)) > 0  
Ü → no Low-Value  
+> ELSE  
Ü → Low-Value  
+--
```

In GEN r7.6 this statement returned the result „> 0“ in all cases.

- ➔ The workaround was to change the logic and to use a return-code , but this problem provoked a number of concerns in general
- ➔ In the meantime this behaviour has been corrected by a PTF (also included in the r7.6 Mainframe-Consolidation-PTF)

# GEN r7.6-Upgrade-Experiences – Mainframe

## PDSE-Usage and DASD-storage-problems

- ▶ No problems were recognized regarding PDSE's, but during our last maintenance weekend at the end of June, we ran into serious problems because some (especially CICS-Loadlibs) PDSE loadlibs ran out of storage
- ▶ We found that 3,000 GEN r7.6-modules needed the same amount of DASD-storage as 55,000 standard-modules (including 9000 pre-GEN-r7.6-modules)
- ▶ we already knew
  - ▶ that Gen-compatibility modules are larger than the corresponding Gen 6.5-modules (up to 90 k)
  - ▶ that standard load-modules transferred from PDS to PDSE need approx. 10% more DASD-storage
- ▶ but we didn't recognize the following effect

Output-example delivered by the binder

```
VIEW          S6300.TEST.LMAPCICS(P63Y571) - 01.00
Columns 00001
Command ==>
002314      REFR                NO
002315      RENT                YES
002316      REUS                YES
002317      RMODE              ANY
002318      SCTR                NO
002319      SSI
002320      SYM GENERATED      NO
002321      TEST               NO
002322      XPLINK             NO
002323      MODULE SIZE (HEX)   0001A9B0
002324      DASD SIZE (HEX)     00062000
```

This means that the DASD-Size of a compatibility-module (stored as program object type 3) is up to three times (or more) larger than the executable part.

If we spoke about 80K-larger compatibility-modules than this has pointed to the "modul-size" (at execution-time loaded into memory) only.



# GEN r7.6-Upgrade-Experiences – Mainframe

## PDSE-Usage and DASD-storage-problems

- ▶ What we did so far to overcome these kinds of problems
  - ▶ organizational tasks
    - ▶ re-organization (including hardware) of our DASD-Storage-pool for the loadlibs
    - ▶ implementation of a monitoring-process to control the number of regenerated applications for a maintenance cycle
  - ▶ technical tasks
    - ▶ test of binder-options to reduce the DASD-size
      - ▶ the binder-option COMPRESS can help to save roundabout one third

Output-example delivered by the binder (without COMPRESS)

```
VIEW          S6300.TEST.LMAPCICS(P63Y571) - 01.00
Command ==>
002314 REFR          NO
002315 RENT          YES
002316 REUS          YES
002317 RMODE        ANY
002318 SCTR          NO
002319 SSI
002320 SYM GENERATED NO
002321 TEST          NO
002322 XPLINK        NO
002323 MODULE SIZE (HEX) 0001A9B0
002324 DASD SIZE (HEX)  00062000
```

Output-example delivered by the binder (with COMPRESS)

```
EDIT          S6300.E001.LMAPCICS(P63Y571) - 01
Command ==>
002301 1SAVE MODULE ATTRIBUTES:
002302
002303 AC              000
002304 AMODE            31
002305 COMPRESSION    BINDER DATA
....
002321 SYM GENERATED NO
002322 TEST          NO
002323 XPLINK        NO
002324 MODULE SIZE (HEX) 0001A9B0
002325 DASD SIZE (HEX)  00043000
```

- ▶ Additionally we started a discussion with Support and Development with the aim to find further ways to reduce the Size (modul- and DASD-) of compatibility modules.

# Themen

GEN r7.6–Upgrade–Experiences - Introduction R+V-Aspects

GEN r7.6–Upgrade–Experiences - Mainframe

**GEN r7.6–Upgrade–Experiences - Distributed Application**

# GEN r7.6-Upgrade-Experiences – Distributed Application

We are using GEN for one really large GUI (standalone) application that represents the main software-bundle to support our sales agencies.

We already knew that the upgrade to GEN r 7.6 includes two (additional) major points in this area:

- ▶ the upgrade from Visual Studio C++ 6.0 to Visual Studio .Net 2005
- ▶ the change from Embedded-SQL (FSP) to ODBC for the connection to SQL-Anywhere

# GEN r7.6-Upgrade-Experiences – Distributed Application

From Visual Studio C++ 6.0 to Visual Studio .Net 2005

- Visual Studio .Net 2005 throws a large number of additional warnings for all string-functions which may confuse the developer a bit at the beginning of the update process
- Now all variables must be declared in the top structure

## Before

```
o P7ZN20X.c
    ...
    //user written code
    #include P7NZ20X.inc
    ...

o P7ZN20X.inc
    ...
    #include <stdio.h>
    //code
    ...
```

## Now

```
o P7ZN20X.c
    ...
    #include <stdio.h>
    //user written code
    #include P7NZ20X.inc
    ...

o P7ZN20X.inc
    ...
    //code
    ...
```

# GEN r7.6-Upgrade-Experiences – Distributed Application

The change from embedded SQL (FSP) to ODBC to connect SQL-Anywhere

History:

Sybase SQL-Anywhere has never been a supported DBMS für GEN. At the times of Texas Instruments the Support-Team in Wiesbaden, Germany had developed a postprocessor (called F(ield) (S)upported (P)roduct). It was based on the generated code for the target DBMS Sybase ASE and made the appropriate changes for SQL-Anywhere.

Unfortunately it never found the way into the product, but we had the chance to get further customized versions from the Gen Optimization Services Team in Brussel.

With GEN r7.5 the situation changed dramatically because the Sybase-support was discarded in general.

We had to decide: Can we get a new FSP (based on what?) or can we use ODBC?  
In coordination with „CA“ we choose to go the (supported) ODBC-way...

... unfortunately a problematic decision because at the same time „CA“ decided that only DB2, SQL Server and Oracle are officially supported for ODBC....

# GEN r7.6-Upgrade-Experiences – Distributed Application

## From Embedded SQL to ODBC - Technical Design Aspects

- The big issue was to keep the productive databases of the sales agents alive without the need to start any special customization (and the risk to loose data)
- There are important differences between the TD represented in the DSD and later in the generated DDL.

Gen 6.5 (Sybase)	Gen 7.6 (ODBC)
Numeric	Decimal
Int	Integer
Datetime	Date
Datetime	Timestamp
Datetime	Time

- In order to keep the DDL in line with the old database-definitions a central „DDL-change-process“ was introduced (~ 800 table-definitions are to be updated)
- Unfortunately the ODBC-TD uses the table and column-names of the DB2-TD so that the ODBC-TD-names had to be renamed. This could be done with a GENSDK-Script delivered by the Optimization Services Team.

# GEN r7.6-Upgrade-Experiences – Distributed Application

From Embedded SQL to ODBC - SQL-statements in an EAB's

## Before with embedded SQL

```
EXEC SQL INSERT INTO KV_VP (  
    ....  
)
```

## Now with ODBC

```
rc = SQLAllocHandle(SQL_HANDLE_STMT, info->hdbc, &hstmt1);  
sprintf(Statement1, "commit;");  
rc = SQLExecDirect(hstmt1, Statement1, SQL_NTS);  
SQLFreeHandle(SQL_HANDLE_STMT, &hstmt1);
```

The project developed a number of ruvODBC-functions to simplify the change

```
SQLRETURN ruvEabOdbcExecute(SQLHSTMT hSqlStmt, char * sqlStatement);
```

# GEN r7.6-Upgrade-Experiences – Distributed Application

## From Embedded SQL to ODBC - Errors and incompatibilities

- ▶▶ SQL-Code -157 when a trigger was called from the Cascade.dll
  - ▶▶ generator error , solved with PTF GEN76039

- ▶▶ non-unique names for HSTMTs (ODBC-statement-handle)

```
Example  
info->sqlca->rc = TiodbcAllocStmt(&hstmt_0494956691_1,  
    "hstmt_0494956691_1",  
    FALSE);
```

CA Support Request 18295244 03 - SAME HTSMT-IDS, UNRELATED ABS  
CA Support Request 18295244 04 - SAME HSTMT-IDS IN RI TRIGGERS  
CA Support Request 18295244 05 - INVALID STATEMENT HANDLES

- ▶▶ incompatibility/generator error , solved with a postprocessor (delivered by the Optimization Services Team)
- ▶▶ TiodbcFreeStmt does not work correct
  - ▶▶ solved with postprocessor (but a PTF was promised)
- ▶▶ Incompatibility between GEN (CA) and SQL Anywhere (Sybase) (and their understanding of ODBC )

```
Example of generated code:  
strcpy(odbc_stmt, "DELETE FROM ");  
strcat(odbc_stmt, "`A_WIRD_BETREUT_DUR`");  
strcat(odbc_stmt, " WHERE CURRENT OF CUR_0004849864_2 ");
```

WHERE CURRENT OF is not supported by SQL Anywhere

- ▶▶ solved with postprocessor
- ▶▶ postprocessing is a big change in the GEN-Build-process
  - ▶ deployment of the changed scripts and the postprocessor to all GEN r7.6-Workstations



# GEN r7.6-Upgrade-Experiences – Distributed Application

other noticed changes with Gen r7.6 – more or less important

- ▶▶ A Keypress-Event with an ACCEPT-action „removes“ blanks
  - ▶▶ the ACCEPT-action was removed because it is the default action
- ▶▶ Division by zero  
the following results should not be delivered by a statement: 1.#IND00 or -1.#IND00  
the application will go on working, but if you use the results, be aware that  
before (-1.#IND00 > 1) = TRUE  
now (-1.#IND00 > 1) = FALSE
- ▶▶ With ODBC you can no longer use a number of functions in a sql-statement

Example:  
UPDATE order  
set date1 to loc date1 + 1 DAYS  
set date2 to Datetext("1970-01-01")  
→ error

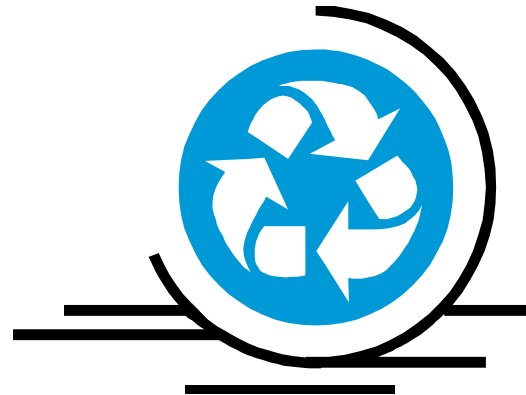
- ▶▶ Build-Process  
before you need to copy the CASCADE.LIB into the C-folder  
now you have to copy CASCADE.LIB and CASCADE.DLL into the C-folder
- ▶▶ External help-files  
before \*.HLP  
now \*.CHM      any good tool available?

## GEN r7.6-Upgrade-Erfahrungen – Dezentrale Anwendung

everything taken into account?

everything tested?

RUVISPC – Release-Rollout end of June 2009



After the rollout.....

## GEN r7.6-Upgrade-Experiences – Distributed Application



no problems related to GEN so far....

# GEN r7.6-Upgrade-Experiences – Distributed Application

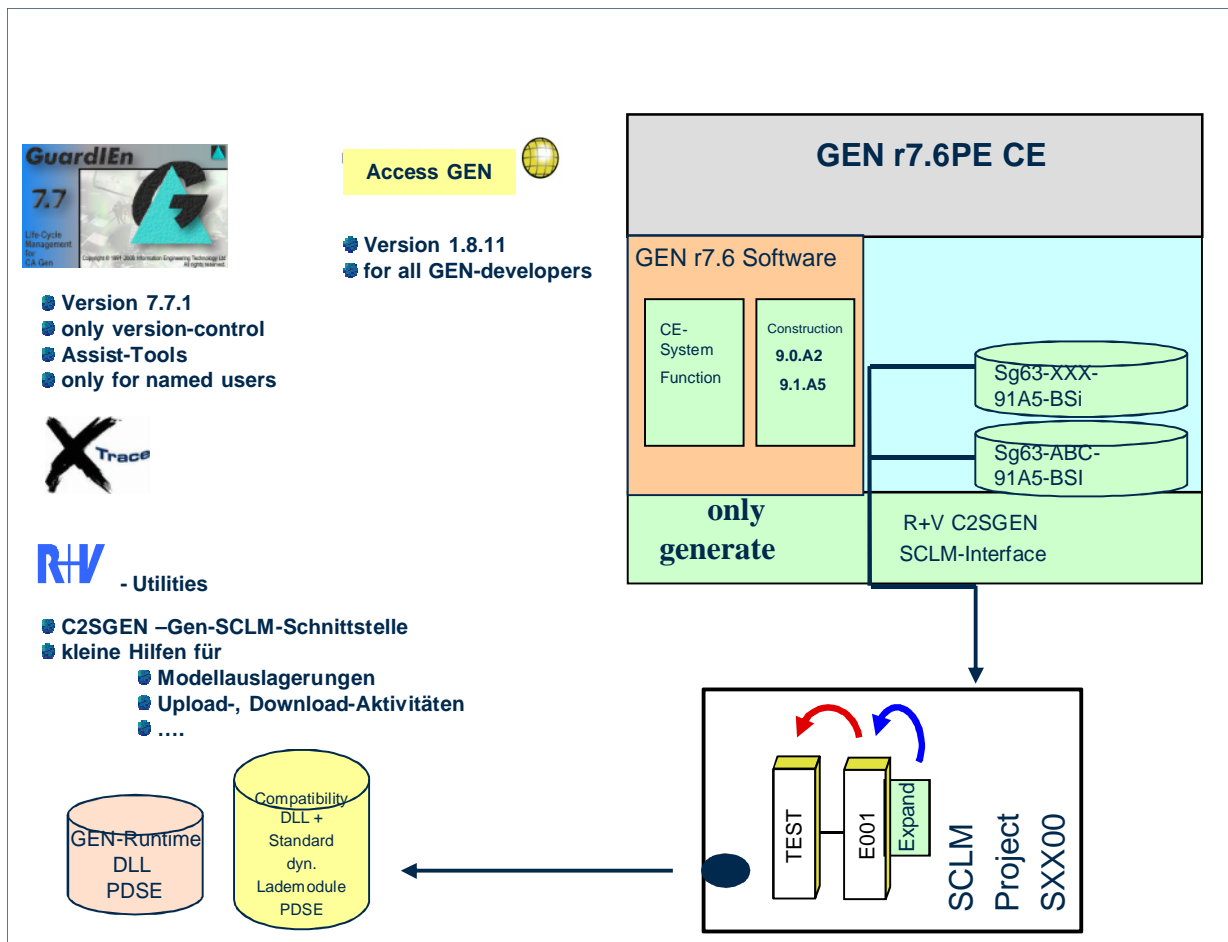
## Other Experiences with GEN r7.6

- ▶▶ a lot of PTF's ... in the meantime workstation-consolidation WKS76002 + X....
- ▶▶ the developers are complaining about slow build- and trace-tool performance
- ▶▶ the trace-tool seems to be a bit unstable when tracing applications with large views
- ▶▶ some unexpected confusion with the support for larger column-names for DB2 after a re-transformation or re-implementation
- ▶▶ the workstation installation is running on Vista since end of June 2009
  - ▶ Toolset works even when under a non-admin-user
    - but we have problems using plugins (only as admin-user)
  - ▶ PTF TSN76044 to overcome toolset-closing-error

# GEN r7.6-Upgrade-Experiences

....here we are today.....

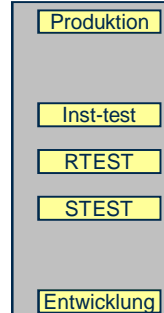
R+V-Gen-Environment in October 2009



Gen-r7.6-Developer-WS on Win-Vista WKS76002+X



Allfusion Harvest





### Questions?

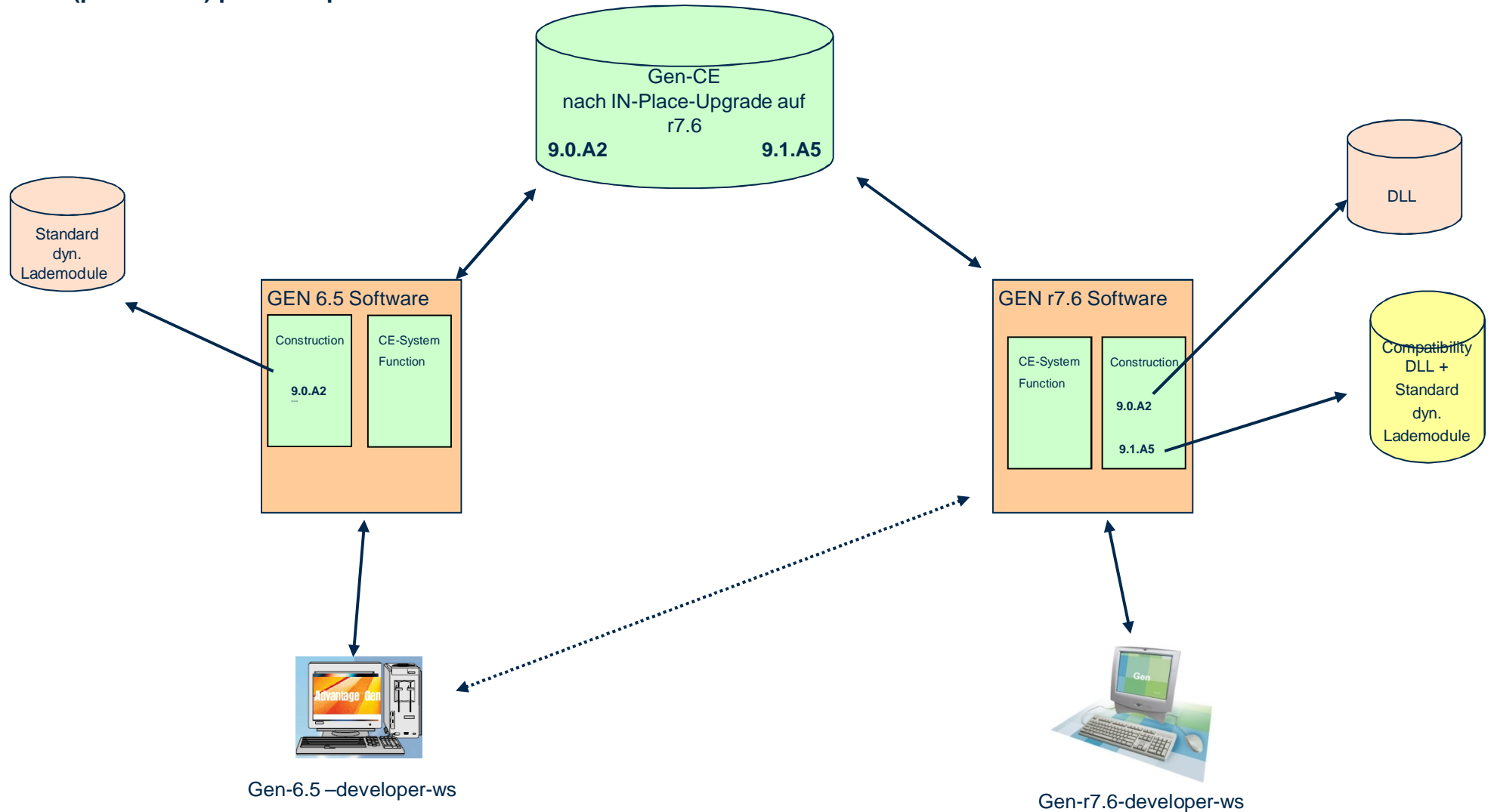
Feel free to send a mail to  
[Klaus.Seeger@RUV.DE](mailto:Klaus.Seeger@RUV.DE)

**Many thanks for your  
attention!**

# Backup

# GEN r7.6-Upgrade-Experiences – Mainframe

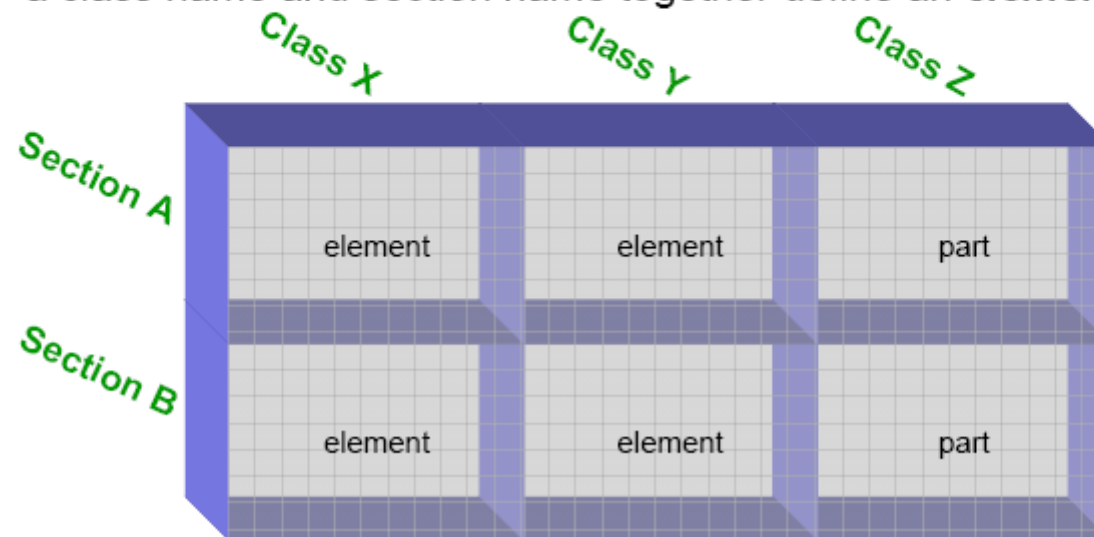
No (productive) parallel-operation of GEN 6.5 and GEN r7.6 CE-software





# GEN r7.6-Upgrade-Experiences – Mainframe

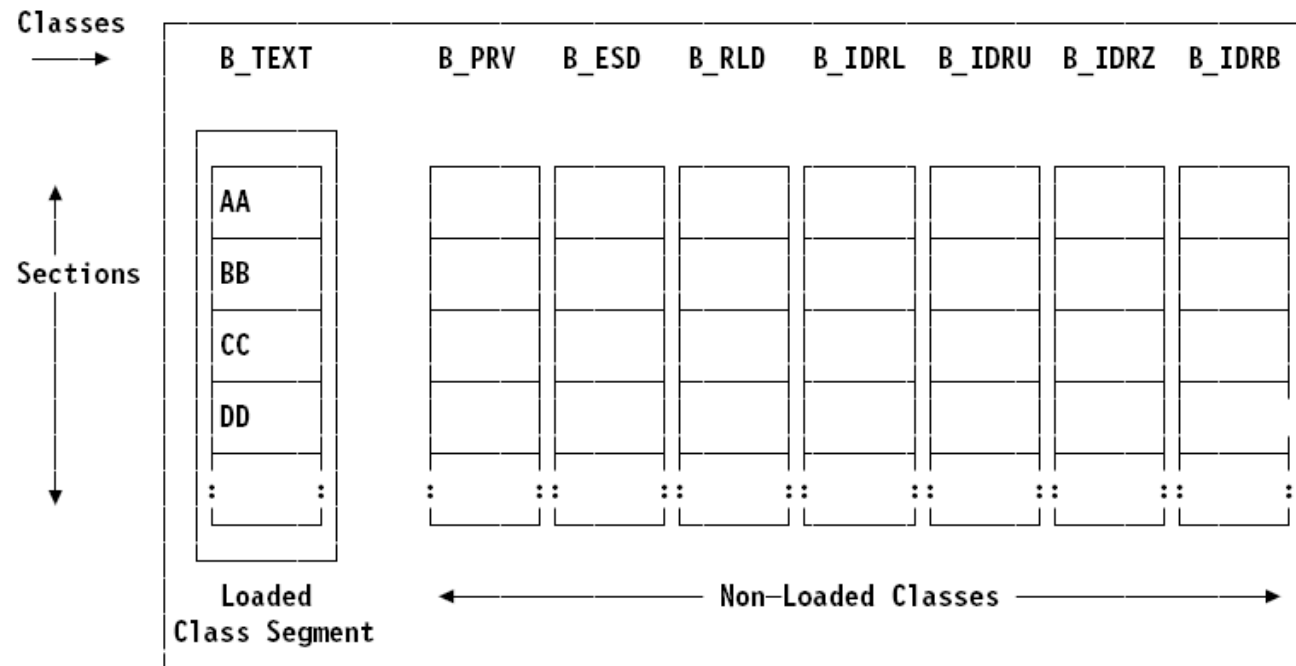
- Program Objects have a 2-D model - **class** and **section**
  - **section** is a generalization of **csect**
  - **class** designates the type of data
  - a class name and section name together define an **element**



Gen-r7.6-developer-ws

## GEN r7.6-Upgrade-Experiences – Mainframe

- Old load modules are mapped into POs (if SYSLMOD is a PDSE):



- B\_TEXT "Loaded Class" behaves like traditional LM's text
- B\_ESD is like LM CESD; B\_RLD is like LM Control/RLD records
  - B\_IDRx classes hold IDR data from **L**anguage translators (L), **U**ser (U), **S**uper **Z**ap (Z), and **B**inder (B)

GEN r7.6 Upgrade - Experiences