Kaiserslautern Mainframe Summit 2010
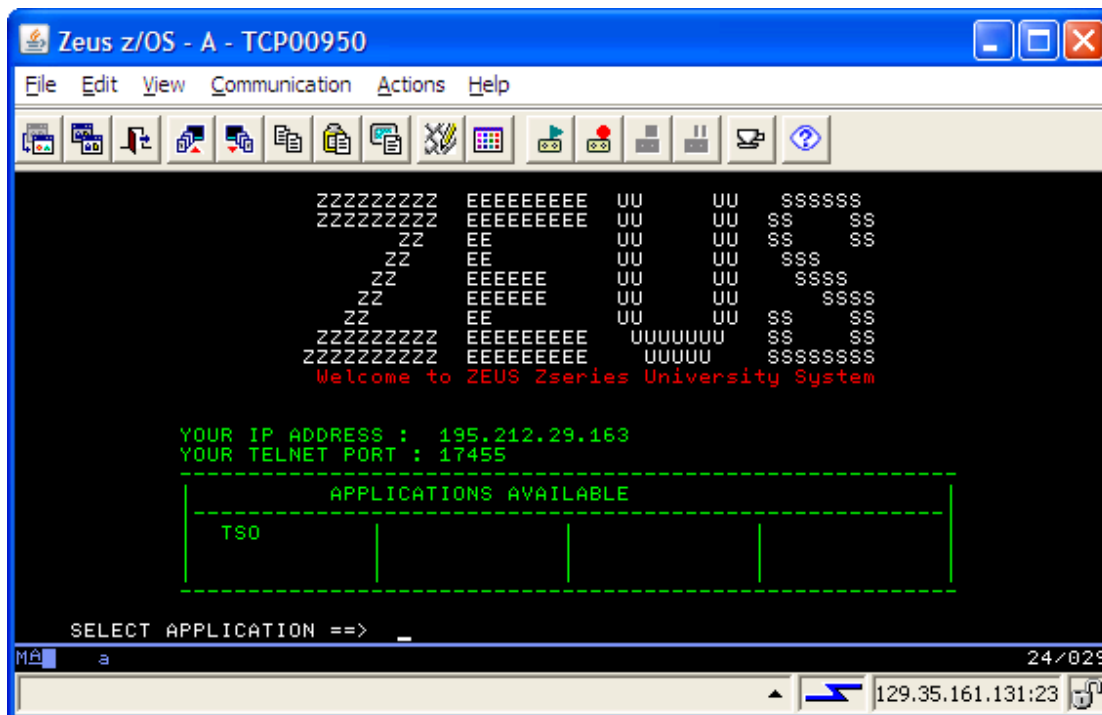
z/OS Praxis
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Inhaltsverzeichnis

Vorbereitung
Zugriff zum Praktikumssystem und
TSO Logon

Access to ZEUS

- Via Internet: Use Host on Demand
- Via Internet: Use Personal Communication (with Certificate)

Via Internet: Use Host on Demand

- Start your Java enabled browser and connect to
  http://zeus.moppssc.com/login.html

  Click on IBM Host On-Demand.

  The first Start of HoD will take some time to download the Java Client
  to your PC

- HoD login with   username   _____**univ**_____

             password   _____**zcourse**____

- Choose "*Zeus z/OS*" by double-click left

- A new window will open – maximise it
- Tab to "Select Application ==>", type "*TSO*" and press <enter>

IBM


```
ZZZZZZZZZ  EEEEEEEEE  UU     UU  SSSSSS
ZZZZZZZZZ  EEEEEEEEE  UU     UU SS    SS
      ZZ   EE         UU     UU SS    SS
     ZZ    EE         UU     UU  SSS
    ZZ     EEEEEE     UU     UU   SSSS
   ZZ      EEEEEE     UU     UU      SSSS
  ZZ       EE         UU     UU SS    SS
ZZZZZZZZZ  EEEEEEEEE   UUUUUUU  SS    SS
ZZZZZZZZZ  EEEEEEEEE    UUUUU    SSSSSSS
          Welcome to ZEUS Zseries University System


YOUR IP ADDRESS : 195.212.29.163
YOUR TELNET PORT : 17455
------------------------------------------------
|            APPLICATIONS AVAILABLE
| -----------------------------------------------
|   TSO       |          |          |
|             |          |          |
------------------------------------------------

SELECT APPLICATION ==> _
```

General Hints

- When you are requested to press <enter>, please press the <right STRG> key!
- If you see stars (three stars!)   ***
  please press <enter>
- You can only enter data in special screen areas. Use the <TAB> key to go to the next typo field
- If you try to enter data in a non-typo area, your keyboard will be locked (see red sign, last line, left side   ← ☺ →)
  to unlock press the <left STRG> key!
- At some point you may end up with a black screen and a ready prompt: to go back to your menu enter ISPF and press enter
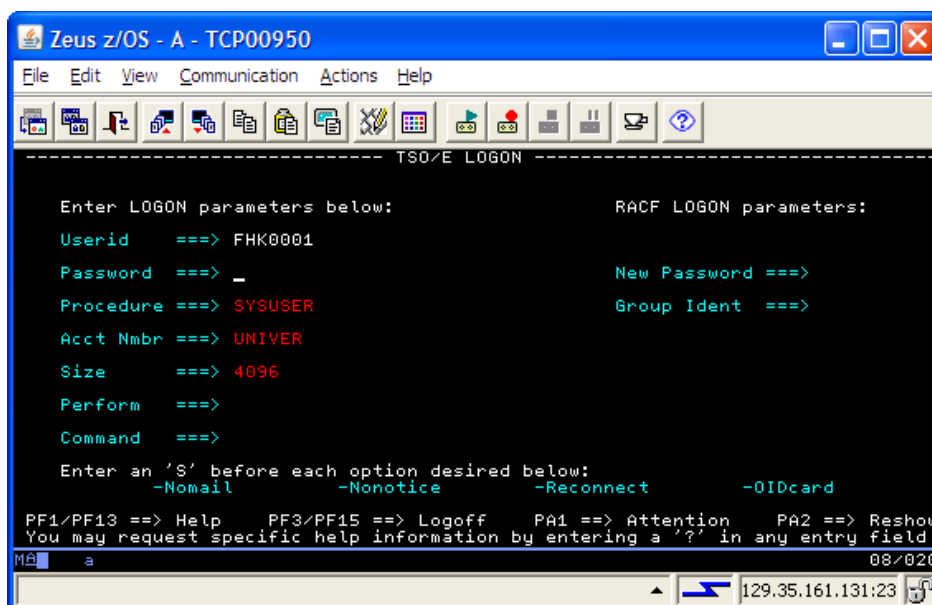
TSO Logon

After successful accessing the ZEUS system, you can now LOGON to TSO
(Time Sharing Option).

Please note your TSO userid _____

And your password _____
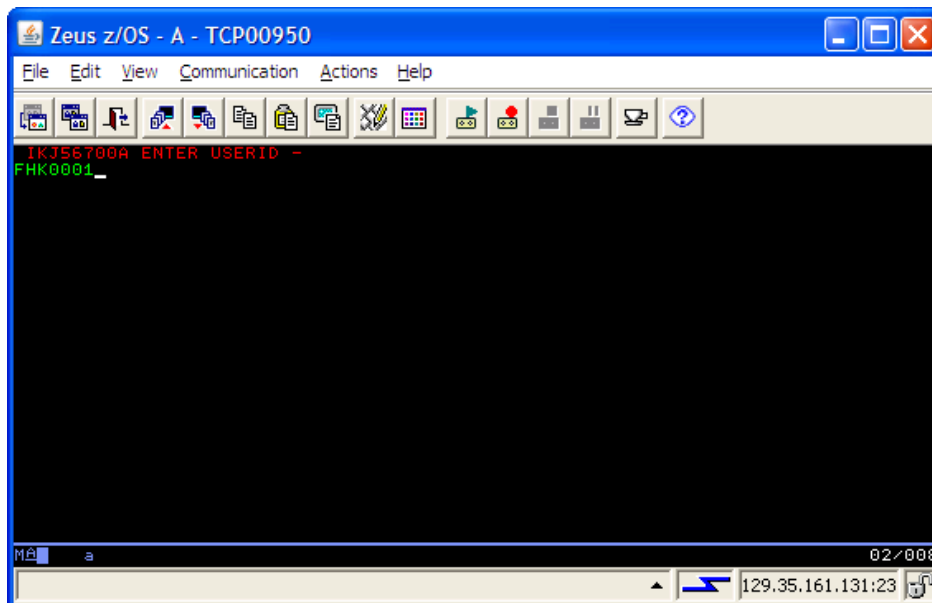
Enter your TSO userid, and press <enter>

Enter your initial Password in the Password field and press <enter>

Change password
On your first Logon you are requested to change your password.
Please enter your new password in the New Password field.
You are required to re-enter your password to verify.

Successful Logon
After successful logon, you will first see a logon message
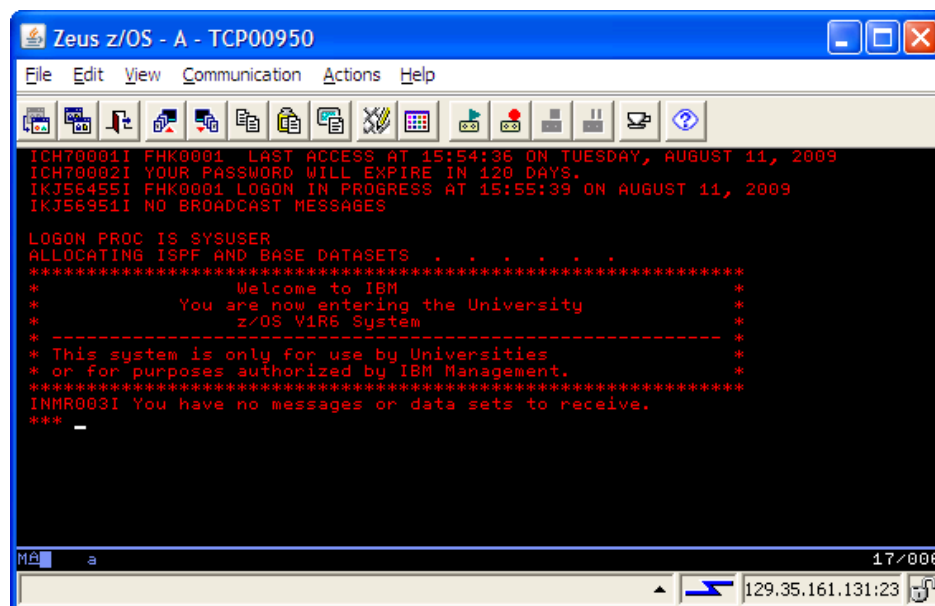
Press <enter> (remember – three stars) and you will automatically switch to
the ISPF POM (Primary Option Menu).
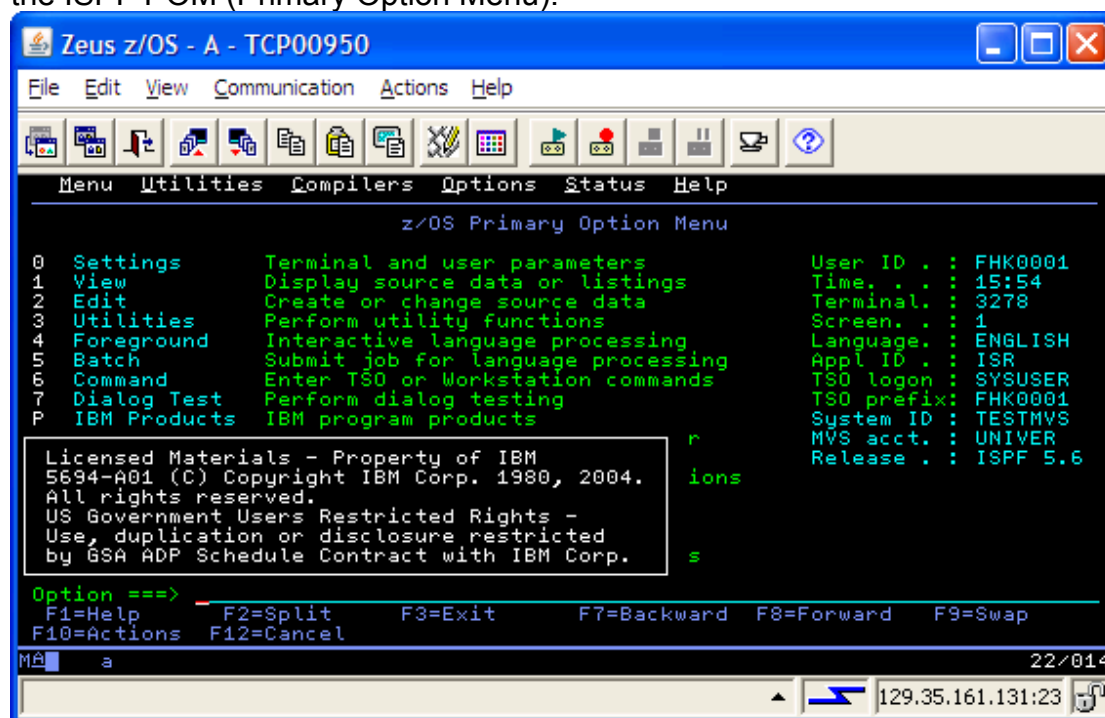
Navigating through the ISPF menus

From the ISPF Primary Option Menu, do the following:

1. Select Utilities, then select **Dslist** from the Utility Selection Panel.

2. Enter SYS1 on the Dsname Level input field and press Enter. What is displayed? Use F8 to page down or forward, F7 to page up or backward, F10 to shift left and F11 to shift right. Exit with F3.

3. Enter SYS1.PROCLIB on Dsname Level input field and press Enter. What is displayed?

4. Enter **v** in the command column (left of) SYS1.PROCLIB. This is a partitioned data set with numerous members. Place an **s** to the left of any member to select the member for viewing. Press F1. What specific help is provided?

5. Enter **=0** on the ISPF command or option line. What is the first option listed in this ISPF Settings panel? Change your settings to place command line at top of panel. This can be done by deleting the / in front of that option. It is effective upon exit from the Settings panel. (via F3)

> **Tipp**: As you become more familiar with ISPF, you will learn the letters and numbers for some of the commonly used options. Preceding an option with the = key takes you directly to that option, bypassing the menus in between. You can also go directly to nested options with the = sign. For example, **=3.4** takes you directly to a commonly used data set utility menu.

6. Enter PFSHOW OFF and then PFSHOW ON. What is the difference? How is this useful?

7. Exit back to the ISPF Primary Option Menu. What value is used to select Utilities? Select **Utilities**.

8. In the Utilities Selection Panel, what value is used to select Dslist? Exit back to the ISPF Primary Option Menu. On the option line, enter the Utilities selection value followed by a period, then enter the Dslist selection value. What panel is displayed?

9. Exit back to the ISPF Primary Option Menu. Place the cursor on the Status entry at the very top of the panel and press Enter. Select the Calendar value and press Enter, then select the Session value. What changed?.

Using the ISPF editor

From the ISPF Primary Option Menu, do the following:

1. Go to Dslist Utility Panel and enter *yourid*.CNTL in the Dsname Level field. Press enter.

2. Place e (edit) to the left of *yourid*.CNTL. Place **s** (select) to the left of member EDITTEST. Enter PROFILE on the edit command line, observe the data is preceded by profile and message lines. Read the profile settings and messages, then enter RESET on the command line. What is the result?

3. Enter any string of characters and the end of the first data line, then press Enter. On the command line, enter CAN (cancel). Press Enter to confirm the cancel request. Again, edit EDITTEST in the data set. Were your changes saved?

4. Observe the SCROLL value to the very right side on the command input line. Scroll ===> PAGE
   Tab to the SCROLL value. The values for SCROLL can be:
   C or CSR   Scroll to where you placed the cursor
   P or PAGE   Full page or screen
   H or HALF   Half page or half screen
   You will find the SCROLL value on many ISPF panels, including the editor. You can change this value by entering the first letter of the scroll mode over the first letter of the current value. Change the value to CSR, place the cursor on another line in the body of the system log, and press F7. Did it place the line with the cursor at the top?

5. Move the cursor to one of the top lines on your display. Press F2. The result is a second ISPF panel. What occurs when F9 is entered repeatedly?

6. Using F9, switch to the ISPF Primary Option Menu, then press F1 to display the ISPF Tutorial panel.

7. From the ISPF Tutorial panel, select **Edit**, select **Edit Line Commands**, then select **Basic Commands**. Press <**Enter**> to scroll through the basic commands tutorial.
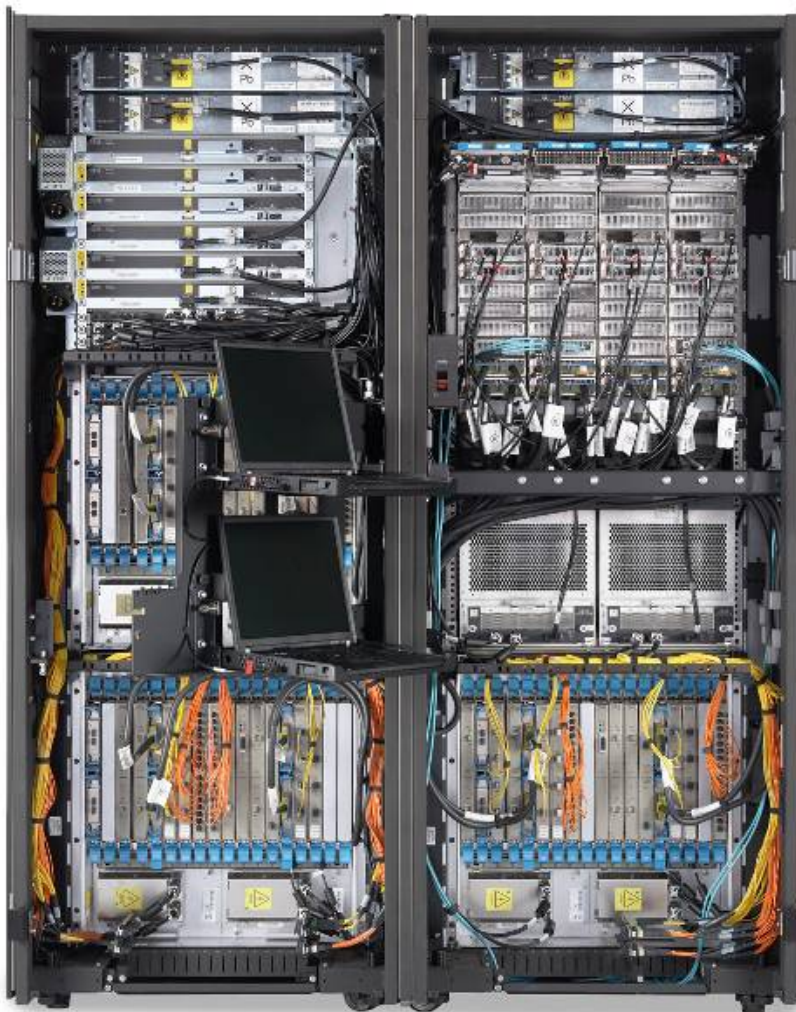
   Now exercise the commands in EDITTEST switching back and forth (F9) to the edit session.

   Which line commands do you use for
   ___   insert line?
   ___   delete line?

   Repeat this same scenario for Move/Copy Commands and Shifting Commands.

8. Enter '**=X**' on the ISPF help panel to end the second ISPF panel session. Save and exit the Edit Panel (F3) to return to the ISPF Primary Option Menu.

IBM System z10 – front internal

Opening the z/OS UNIX shell and entering commands

From the ISPF Primary Option Menu, select Option 6, then enter the **OMVS** command.

Falls die Unix Shell nicht funktioniert, bitte komplett ausloggen und neu einloggen. Der fehlende Folder sollte dann angelegt sein.

From your home directory, enter the following shell commands:

id	Shows your current id.
date	Shows time and date.
man date	Manual of the date command. You can forward the panels by pressing Enter. Enter quit to exit.
man help	for the manual.
env	Environment variables for this session.
type read	Identifies whether read is a command, a utility, an alias, and so forth.
type man	
type date	
ls	List a directory.
ls -l	List the current directory.
ls -l /etc.	List the directory /etc.
cal	Display a calender of the current month.
cal 2005	Display a calender of the year 2005.
cal 1752	Display the calender for the year 1752. Is September missing 13 days? [Answer: Yes, all UNIX calendars have 13 days missing from September 1752.] Optional: To find out why, ask a History major!
exit	End the OMVS session.

Using the OEDIT and OBROWSE commands

Another way to start the OMVS shell is by entering the command

TSO OMVS

on any ISPF panel. From your home directory, enter the following shell commands:

cd /tmp   This is a directory that you have authority to update
oedit *myfile*   This opens the ISPF edit panel and creates a new text file in the current path. Write some text into the editor. Save and exit (F3).
                            myfile MUST BE any file you choose to create.

ls
ls -l
obrowse *myfile*   Browse the file you just created.
exit   End the OMVS session

Exploring ISPF Option 3.4

One of the most useful ISPF panels is Option 3.4. This terminology means, starting from the ISPF primary option menu, select Option 3 (Utilities) and then Option 4 (Dslist, for data set list). This sequence can be abbreviated by entering 3.4 in the primary menu, or =3.4 from any panel.

Many ISPF users work almost exclusively within the 3.4 panels. We cover some of the 3.4 functions here and others in subsequent exercises in this text. Use care in working with 3.4 options; they can effect changes on a individual or system-wide basis.

z/OS users typically use ISPF Option 3.4 to check the data sets on a DASD[1] volume or examine the characteristics of a particular data set. Users might need to know:

- What data sets are on this volume?
- How many different data set types are on the volume?
- What are the DCB characteristics[2] of a particular file?

Let's answer these questions using **DMTU02** as a sample volume, or another volume as specified by your instructor:

1. In the 3.4 panel, enter DMTU02 in the Volume Serial field. Do not enter anything on the Option==> line or in the Dsname Level field.
2. Use PF8 and PF7 to scroll through the data set list that is produced.
3. Use PF11 and PF10 to scroll sideways to display more information. This is not really scrolling in this case; the additional information is obtained only when PF11 or PF10 is used.

---

[1] z/OS supports many different devices for data storage. Disks or tape are most frequently used for storing data sets on a long term basis. Disk drives are known as direct access storage devices (DASDs) because, although some data sets on them might be stored sequentially, these devices can handle direct access. Tape drives are known as sequential access devices because data sets on tape must be accessed sequentially.

The term DASD applies to disks or simulated equivalents of disks. All types of data sets can be stored on DASD (only sequential data sets can be stored on magnetic tape). You use DASD volumes for storing data and executable programs, including the operating system itself, and for temporary working storage. You can use one DASD volume for many different data sets, and reallocate or reuse space on the volume.

[2] Data Set Record Formats:

- Block Size (BLKSIZE) is the physical block size written on the disk for F and FB records. For V, VB, and U records it is the maximum physical block size that can be used for the data set.
- Logical Record Size (LRECL) is the logical record size (F, FB) or the maximum allowed logical record size (V, VB) for the data set. Format U records have no LRECL.
- Record Format (RECFM) is F, FB, V, VB, or U.

These terms are known as data control block (DCB) characteristics, named for the control block where they may be defined in an assembly language program. The user is often expected to specify these parameters when creating a new data set.

The first PF11 display provides tracks, percent used, XT, and device type.
The XT value is the number of extents used to obtain the total tracks shown[3].
The ISPF utility functions can determine the amount of space actually used for
some data sets and this is shown as a percentage when possible.

The next PF11 display shows the DCB characteristics: DSORG, RECFM,
LRECL, and BLKSIZE.
PS   Sequential data set (QSAM, BSAM)
PO   Partitioned data set
VS   VSAM data set
blank   Unknown organization (or no data exists)

> **Hint:** RECFM, LRECL, and BLKSIZE maybe not familiar to you,
> but that's okay. In some cases, usually when a standard access
> method is not used or when no data has been written, these
> parameters cannot be determined. VSAM data sets have no direct
> equivalent for these parameters and are shown as question
> marks.

What can you do with the datasets… Enter a **/** in front of the dataset name.

OPTIONAL: Look at another volume for which a larger range of
characteristics can be observed.

Try searching using a wildcard (*).

Another way to find such a volume is to use option 3.2 to find where
SYS1.PARMLIB resides, then examine that volume.

---

[3] Space for a disk data set is assigned in extents. An extent is a contiguous number of disk
drive tracks (or cylinders). Data sets can increase in extents as they grow. Older types of data
sets can have up to 16 extents per volume. Newer types of data sets can have up to 128
extents per volume or 255 extents total on multiple volumes.

In z/OS, a data set organization based on extents is designed to maximize disk performance.
Reading or writing contiguous tracks is faster than reading or writing tracks scattered over the
disk, as might be the case if tracks were allocated dynamically.

Submitting a job –SORT1

In this exercise you will submit a batch job.

1. From the ISPF panel =3.4 select as dataset name level *userid* or *userid*.*
2. Select the dataset *userid*.CNTL with a **e** (for edit)
3. Select the member SORT1 by pressing enter (or **e** for edit)

```
//FHB00XXA JOB (UNIVER),'FHCOBURG',MSGCLASS=H,MSGLEVEL=(1,1),
//         NOTIFY=&SYSUID.,CLASS=A,REGION=6M
//*******************************************************************
//*   JOB  SUBMITTED FROM FHB00XX.CNTL(XXXXXXXX)             ***
//*   DOC: SORTING LIST AND "PRINT" TO SYSOUT (SORTOUT)      ***
//*******************************************************************
//MYSORT    EXEC PGM=SORT
//SYSOUT    DD SYSOUT=*
//SORTWK01  DD UNIT=SYSDA,SPACE=(CYL,(5,1))
//SORTIN    DD DISP=SHR,DSN=&SYSUID..CNTL(SORTDATA)
//SORTOUT   DD SYSOUT=*
//SYSIN     DD *
  SORT FIELDS=(4,11,CH,A)
//* THE STATEMENT ABOVE WILL SORT USING THE LASTNAME
//* IF YOU WANT TO SORT USING FIRSTNAME, CHANGE THE SORT FIELDS
//* STATEMENT TO    (16,9,CH,A)
//* HAVE A LOOK AT SORTDATA TO IDENTIFY THE MEANING OF THE PARAMETER
```

change   FHB00XXA   to   *userid*A

Review the Job

MYSORT   You exec a LOAD Module called SORT (which does what it says)

SORTIN   This is the Sortinput Data, you find this in the same PDS dataset, member SORTDATA

SORTOUT   Is the target where the sort should be put on. In this case it will be "printed" to the systemoutput

On the commandline enter SUB (for submit)
```
Command ===>SUB_____
```

You should see a message like
```
IKJ56250I JOB FHB0002A(JOB00223) SUBMITTED
 ***
```
Three stars – so you have to press enter

After a short time a second message should appear
```
11.53.57 JOB00223 $HASP165 FHB0002A ENDED AT TSTMVS01  MAXCC=0 CN(INTERNAL)
***
```

By now the job was submitted, and –hopefully – successful executed on the system. The Output of this job can be found in the SDSF (see next exercise)

Using SDSF to display Joblog

SDSF gives you an easy and efficient way to monitor, manage and control the key aspects of your z/OS JES2 system.
You can:

- Control job processing (hold, release, cancel, and purge jobs)
- Control output, and browse jobs without printing
- Control devices such as printers, lines, and initiators across the MAS
- Browse the syslog
- Manage system resources, such as members of the MAS, job classes, and WLM enclaves
- Monitor and control the IBM Health Checker for z/OS checks

To go to the SDSF Primary Option Menu, enter S in the z/OS Primary Option Menu and hit enter.

```
   Display  Filter  View  Print  Options  Help
 -------------------------------------------------------------------------------
 HQX7708 ----------------  SDSF PRIMARY OPTION MENU  ------------------------

 DA    Active users                  ULOG  User session log
 I     Input queue
 O     Output queue
 H     Held output queue
 ST    Status of jobs

 LOG   System log

 END   Exit SDSF




 COMMAND INPUT ===> _                                       SCROLL ===> PAGE
  F1=HELP      F2=SPLIT     F3=END      F4=RETURN    F5=IFIND     F6=BOOK
  F7=UP        F8=DOWN      F9=SWAP     F10=LEFT     F11=RIGHT    F12=RETRIEVE
 MA  +  a                                                           22/021
```

Now let's check if your job finished successful.

Control job output
SDSF displays detailed information about output that is ready to be printed, including:

- The high return code for a job
- The total number of lines to be printed
- Classes the output is assigned to
- Forms needed for printing
- Date the output was created.

Enter H on the Command Input of the SDSF PRIMARY OPTION MENU.
This displays the HELD OUTPUT QUEUE panel.

```
   Display  Filter  View  Print  Options  Help
 -------------------------------------------------------------------------------
 SDSF HELD OUTPUT DISPLAY ALL CLASSES  LINES 117        LINE 1-1 (1)
 NP   JOBNAME  JobID    Owner    Prty C ODisp Dest             Tot-Rec  Tot-
      FHB0030A JOB00482 FHB0030   144 H HOLD  LOCAL                117




















 COMMAND INPUT ===> _                                   SCROLL ===> PAGE
  F1=HELP     F2=SPLIT     F3=END      F4=RETURN    F5=IFIND    F6=BOOK
  F7=UP       F8=DOWN      F9=SWAP     F10=LEFT     F11=RIGHT   F12=RETRIEVE
 MA  +   a                                                        22/021
```

The Held Output Queue panel allows the user to display information about
SYSOUT data sets for jobs, started tasks, and TSO users on any held JES2
output queue.

You may scroll, using the keys F7, F8, F10 and F11.

Search for your submitted job by looking for the Jobname (FHB00xxA)

To see details of your job, enter an S on the NP column in front of the desired
jobname. Press enter.

Your output may look like this:

```
   Display  Filter  View  Print  Options  Help
 ------------------------------------------------------------------------
 SDSF OUTPUT DISPLAY FHB0030A JOB00482  DSID     2 LINE 0      COLUMNS 02- 81
 COMMAND INPUT ===> _                                  SCROLL ===> PAGE
 ****************************** TOP OF DATA ******************************
                 J E S 2  J O B  L O G  --  S Y S T E M  M V S 1  --  N O D E

 15.22.50 JOB00482 ---- MONDAY,    05 MAR 2007 ----
 15.22.50 JOB00482  IRR010I  USERID FHB0030  IS ASSIGNED TO THIS JOB.
 15.22.50 JOB00482  ICH70001I FHB0030  LAST ACCESS AT 15:21:11 ON MONDAY, MARCH 5
 15.22.50 JOB00482  $HASP373 FHB0030A STARTED - INIT 2   - CLASS A - SYS MVS1
 15.22.50 JOB00482  IEF403I FHB0030A - STARTED - TIME=15.22.50
 15.22.50 JOB00482  -                                        --TIMINGS (MINS.)--
 15.22.50 JOB00482  -JOBNAME  STEPNAME PROCSTEP   RC   EXCP   CPU   SRB  CLOCK
 15.22.50 JOB00482  -FHB0030A          MYSORT     00   59   .00   .00   .00
 15.22.50 JOB00482  IEF404I FHB0030A - ENDED - TIME=15.22.50
 15.22.50 JOB00482  -FHB0030A ENDED.  NAME-FHCOBURG           TOTAL CPU TIME=
 15.22.50 JOB00482  $HASP395 FHB0030A ENDED
 ------ JES2 JOB STATISTICS ------
   05 MAR 2007 JOB EXECUTION DATE
          17 CARDS READ
         117 SYSOUT PRINT RECORDS
   F1=HELP     F2=SPLIT    F3=END     F4=RETURN   F5=IFIND    F6=BOOK
   F7=UP       F8=DOWN     F9=SWAP    F10=LEFT    F11=RIGHT   F12=RETRIEVE
 MA + a                                                          04/021
```

Scroll down and right and try to read the content of the joblog. At the moment there is no need to fully understand the joblog, but try to search for the Return Code of the job (RC). The Return Code is a numeric code that lets you know the status of the finished job. The graphic gives you details about the RC.

Return codes from services

Each service returns a numeric code, called a return code, indicating the results of the operation. These return codes are summarized in Table 1.

Table 1. Service Return Codes

Operation Results	Return Code	Reason
Normal completion	0	Indicates that the service completed operation without errors.
Exception condition	4, 8	Indicates a condition that is not necessarily an error, but that the dialog should be aware of. A return code of 4 is informational, while an 8 generally indicates a non-terminating error condition, such as the end of a data set or member list.
Error condition	10, 12, 14, 16, 20	Indicates that the service did not complete operation because of errors. Use the CONTROL service to control errors with a return code of 12 or greater. Return codes of 10 and 14 are particular to PDF component services.

Return codes and their meanings vary for each service and are listed with each service description in this chapter.

Did the job finish successful?

Did you find the results of the sort job?
As we stated in our SORT job that the results should be written to SYSOUT (//SORTOUT   DD SYSOUT=*) the sorted data is attached to the joblog. (You will see another possibility in the exercise of the next chapter. There you will create a new dataset and place your sorted data in this new dataset.

Try to scroll to the end of the joblog (you can scroll right to end end by typing m and pressing F8). Here you will find the sorted data.

```
    Display  Filter  View  Print  Options  Help
 --------------------------------------------------------------------
  SDSF OUTPUT DISPLAY FHB0030A JOB06315  DSID   102 LINE 32      COLUMNS 02- 81
  COMMAND INPUT ===> _                                      SCROLL ===> PAGE
 ICE188I 0 DATA SPACE STORAGE USED = 0K BYTES
 ICE052I 0 END OF DFSORT
 1  Aar        Karl      1002000   V6                              00020001
 2  Aar        Rolf      1131515   RZ                              00270000
 1  Albert     Otto      1002222   V7                              00030000
 2  Bachlauf   Josef     4011124   RZ                              00040000
 2  Barney     Werner    3002511   RZ                              00050000
 2  Bausch     Hugo      7002314   V8                              00060000
 1  Binsen     Josef     2002311   RZ                              00070000
 1  Bruckner   Hugo      8002313   V3                              00080000
 1  Degenfest  Ernst     6877777   V0                              00090000
 1  Duftnote   Otto      6232323   RZ                              00100000
 2  Endrebex   Werner    7239744   RZ                              00110000
 1  Engadino   Otto      1111222   RZ                              00120000
 1  Gretschg   Otto      8822233   MZ                              00130000
 1  Grossauf   Josef     1172922   RZ                              00140000
 5  Johanna    Josef     0976543   RZ                              00150000
 1  Max        Hugo      0974758   RZ                              00160000
  F1=HELP     F2=SPLIT    F3=END     F4=RETURN   F5=IFIND    F6=BOOK
  F7=UP       F8=DOWN     F9=SWAP    F10=LEFT    F11=RIGHT   F12=RETRIEVE
 MA + a                                                          04/021
```

Spilt the screen and search for the input data (userid.CNTL(SORTDATA)). Open it and compare it to the sorted result. Remember to swap the screens using F9.

You close the splitted screen by pressing repeatedly F3.

You can display job output before deciding to print it. Print or search output. Or exploit the power of ISPF and use ISPF's edit or browse function to view output.

As usual, you return to the main panel pressing F3.

As stated ealier SDSF gives you more possibilties:

Control job processing
SDSF provides an easy way to control JES2 jobs, which can help your users work more efficiently. It gives immediate, up-to-date, MAS-wide information about jobs waiting to be processed or in execution. You can display all active jobs, all jobs on a specific queue, or display detail for a job no matter where it is in the sysplex. And you can display output as it is created.

Please enter DA on the Commad Input of the SDSF PRIMARY OPTION MENU. This displays the DISPLAY ACTIVE USERS panel.

```
   Display  Filter  View  Print  Options  Help
 ----------------------------------------------------------------------
 SDSF DA MVS1  TESTMVS   PAG    0 SIO     0 CPU    4      LINE 1-17 (93)
 NP    JOBNAME  StepName ProcStep JobID    Owner    C Pos DP Real Paging    SIO
       *MASTER*                   STC06368 +MASTER+   NS  FF 4857  0.00    0.00
       PCAUTH   PCAUTH                                NS  FE  143  0.00    0.00
       RASP     RASP                                  NS  FF  251  0.00    0.00
       TRACE    TRACE                                 NS  FF  119  0.00    0.00
       DUMPSRV  DUMPSRV  DUMPSRV                       NS  FF  109  0.00    0.00
       XCFAS    XCFAS    IEFPROC                       NS  FF 1501  0.00    0.00
       GRS      GRS                                   NS  FF  536  0.00    0.00
       SMSPDSE  SMSPDSE                               NS  FF 2683  0.00    0.00
       CONSOLE  CONSOLE                               NS  FF 2655  0.00    0.00
       WLM      WLM      IEFPROC                       NS  FF  999  0.00    0.00
       ANTMAIN  ANTMAIN  IEFPROC                       NS  FF 1060  0.00    0.00
       ANTAS000 ANTAS000 IEFPROC                       NS  FE  919  0.00    0.00
       OMVS     OMVS     OMVS                          NS  FF  21T  0.00    0.00
       JESXCF   JESXCF   IEFPROC                       NS  FF  554  0.00    0.00
       ALLOCAS  ALLOCAS                               NS  FF 1414  0.00    0.00
       IOSAS    IOSAS    IEFPROC                       NS  FF  300  0.00    0.00
       MMS      MMS      IEFPROC                       NS  FF  281  0.00    0.00
 COMMAND INPUT ===> _                               SCROLL ===> PAGE
  F1=HELP      F2=SPLIT     F3=END      F4=RETURN   F5=IFIND     F6=BOOK
  F7=UP        F8=DOWN      F9=SWAP     F10=LEFT    F11=RIGHT    F12=RETRIEVE
 MA   +   a                                                      22/021
```

The DA panel shows information about MVS address spaces (jobs, started
tasks, and TSO users) **that are running**. SDSF obtains the information from
RMF when it is installed.

Try to scroll, using the keys F7, F8, F10 and F11.

The meaning of the columns is indicated in the headline. Important columnes
are amongst others JOBNAME, STEPNAME, REAL (Current real storage
usage in frames), CPU% (Percent of CPU time comsumed by and on behalf
of the address space during the most recent interval measured) and CPU-
TIME (Accumulated CPU time comsumed by and on behalf of the address
space, for the current job step, in seconds).

Striking the enter key refreshes the view and returns new values.

Return to the main panel pressing F3.

SYSLOG

SDSF lets you view the system log online and search for specific information using SDSF commands. You can also view a merged sysplex log. A separate display of system requests, which includes WTORs and action messages, makes it easy to find and reply to those messages.

To access the SYSLOG type LOG in the Command Input of the SDSF PRIMARY OPTION MENU.

The Syslog panel may look like this:

```
   Display  Filter  View  Print  Options  Help
 -------------------------------------------------------------------------
 SDSF SYSLOG   6368.101 MVS1 MVS1 03/05/2007 1W  109436      COLUMNS  51 130
 COMMAND INPUT ===> _                                    SCROLL ===> PAGE
       ELAPSED TIME=   .00
 0090  $HASP395 FHB0030A ENDED
 0090  $HASP309 INIT 2    INACTIVE ******** C=BA
 0290  SE '15.22.50 JOB00482 $HASP165 FHB0030A ENDED AT TSTMVS01  MAXCC=0',
       LOGON,USER=(FHB0030)
 0090  ISZ0261I CARRUTH LU L47E VTAM session CICSZ666(6) starting - LOGMODE=D4B
       32792 ACB=ISZ002
 0281  $HASP100 BEL0010A ON INTRDR      ANGELA  FALCONER      FROM TSU00479
       BEL0010
 0290  IRR010I  USERID BEL0010  IS ASSIGNED TO THIS JOB.
 0281  IEF677I WARNING MESSAGE(S) FOR JOB BEL0010A ISSUED
 0281  ICH70001I BEL0010  LAST ACCESS AT 15:18:00 ON MONDAY, MARCH 5, 2007
 0090  $HASP373 BEL0010A STARTED - INIT 2    - CLASS A - SYS MVS1
 0090  IEF403I BEL0010A - STARTED - TIME=15.24.51
 0290  -                                   --TIMINGS (MINS.)--
       ----PAGING COUNTS---
 0290  -JOBNAME  STEPNAME PROCSTEP    RC   EXCP    CPU    SRB  CLOCK   SERV  PG
         PAGE    SWAP    VIO SWAPS
  F1=HELP     F2=SPLIT    F3=END     F4=RETURN   F5=IFIND    F6=BOOK
  F7=UP       F8=DOWN     F9=SWAP    F10=LEFT    F11=RIGHT   F12=RETRIEVE
 MA + a                                                          04/021
```

Reference/Literature

For further reference please download the IBM documentation "SDSF Operation and Customization" on
http://www.ibm.com/servers/eserver/zseries/zos/sdsf/isflib.html

Submitting a job –SORT2

Use the same procedure to access *userid*.CNTL like in the exercise before.
Review member SORT2
The difference is, that the OUTPUT of that SORT will be placed into the same
PDS data set, but in a different member (SORTOUTP).

Submit the Job
Review the Joblog (using SDSF)
And review the result (Member in *userid*.CNTL)

Optionale Übung 1
REXX

Wechseln Sie zur Data Set List Utility (3.4) und rufen Sie Ihre Datasets auf.

Erstellen eines REXX Programms – Hello World
Erweitern Sie in der Datei *userid.REXX.CLIST* das Member **HELLOW**.

Zusätzliche Zeilen fügen Sie mit dem Line Command i ein.

In dieses Member wollen wir den Hello World schreiben:
```
/* REXX - Just say the word(s) */
say 'Hello World'
exit
```
Wechseln Sie ins ISPF Menu 6 (Commands) (am besten mithilfe eines Split-Screens) und rufen Sie die REXX Proc auf via
          EXEC REXX(HELLOW)
bzw. ggf.   EXEC '*userid*.REXX.CLIST(HELLOW)'

Erstellen eines REXX Programms – Division
Erweitern Sie in der Datei *userid.REXX.CLIST das* Member **DIV**.
```
/* REXX EXEC für Division zweier Zahlen */
/**********************************************************/
say 'Zaehler :'
pull z
say 'Nenner :'
pull n
if n=0 then say 'Division durch 0 nicht erlaubt'
else do
say z 'geteilt durch' n 'ist' z/n
say 'oder'
say z 'geteilt durch' n 'ist' z%n 'Rest' z // n
end
```

Wechseln Sie ins ISPF Menu 6 (Commands) und rufen Sie die REXX Proc auf via
      EXEC REXX.CLIST(DIV)

Achtung: bei *** erst STRG drücken, dann 2. Zahl eingeben

OPTIONAL: LITLGAME
Rufen Sie die REXX LITLGAME auf, korregieren Sie evtl. Fehler.
*userid.*REXX.CLIST(LITLGAME)

Referenzen:
- REXX Literatur http://www.ibm.com/servers/eserver/zseries/zos/bkserv/
  dort *z/OS elements and features publications*, die PDF Versionen von
  V1R6, dann *TSO/E,* Broschüren REXX Users Guide und REXX
  Reference

Optionale Übung 2
Selfstudy ISPF und JCL

Selfstudy ISPF

- Bearbeiten Sie im Team das Lernprogramm (Interactive Courses) „ISPF Courses"
  http://publib.boulder.ibm.com/infocenter/zos/basics/index.jsp

    o „30-minute courses on z/OS"
    o „Interactive System Productivity Facility (ISPF) courses"
      und die einzelnen Kapitel als Courses bearbeiten
      (Alternativ als PDF runterladen)

    o Dauer: ca. 0,5 - 1 Std.

Selfstudy JCL

- Bearbeiten Sie im Team das Lernprogramm (Interactive Courses) „Introduction to JCL"
  http://publib.boulder.ibm.com/infocenter/zos/basics/index.jsp

    o „30-minute courses on z/OS"
    o „Job control language (JCL) basics course"
      als Course bearbeiten

    o Dauer: ca. 0,5 - 1 Std.

- Downloaden Sie eine JCL Broschüre aus dem Internet für Ihre Referenz:
  http://www.ibm.com/systems/z/os/zos/bkserv/
  dort *z/OS elements and features publications*, die PDF Versionen von *V1R10* dann *MVS*
    o Broschüre(n):
      z/OS V1R10.0 MVS JCL Reference

Machen Sie sich kurz mit dem Aufbau der Broschüre vertraut. Wichtig ist die Reference aller Parameter

Optionale Übung 3
Erstellen eines einfachen Jobs

1. Editieren Sie das Member **COPY1** in der Datei *userid.CNTL*.

2. Geben Sie Ihre JOB-Anweisung mit folgenden Angaben ein:
   - Der Jobname ist ***useridA*** (Ihre Benutzer-ID mit einem A am Ende).
   - Die Accounting ist (UNIVER)
   - Der Name des Programmierers ist Ihr Name.
   - Die Nachrichtenklasse (Messageclass) ist **H**
   - Die Nachrichtenstufe (Messagelevel) ist **1,1**.
   - Sie sollen benachrichtigt werden, wenn der Job beendet ist.
   - Führen Sie den Job in Klasse **A** aus

3. Vervollständigen Sie die EXEC-Anweisung, indem Sie das Programm IEBCOPY aufrufen.

4. Vervollständigen Sie die DD-Anweisungen wie folgt:

   - SYSUT1 ist *UDEMSTR.ES10V3.PROC*.

   - SYSUT2 ist eine neue Datei mit dem Namen *userid.ES10.PROC*, die mit denselben Merkmalen wie *UDEMSTR.ES10V3.PROC* angelegt werden soll.

     Hinweis: Sollte das DD Statement über mehrere Zeilen gehen, muss ein Komma am Ende der Zeile als Fortsetzung angegeben werden

5. Übergeben (**SUB**mitten) Sie den Job. Durch die Eingabe von SUB

6. Zeigen Sie die Ausgabe mit Hilfe von SDSF an. Lassen Sie die Ausgabe im Spool.

Optionale Übung 4
Compile and link a C-source code

by Frank Hoffmann, FH Coburg

ca. 30 – 45 Min

Targets of this lab

During the last labs you have learned how to access Zeus via web, how to navigate using ISPF, how to use the editor and basic commands to navigate within the UNIX Shell.
Further you have learned how to find and evaluate a JobLog after you submitted a job using JCL (Job Control Language).

In this lab you will learn how to compile and link a c-source code on z/OS.

If you successfully finished the optional chapter „Selfstudy JCL" you can skip the next part and continue with „compile and link a C-source code" directly.
If you did not, the next chapter is recommended to work through before continuing.

Further JCL-instructions

This chapter will give you a short introduction about JCL and enable you to master this lab. For further information read through the pages about JCL and SDSF (chapter 6) in the IBM RedBook "Introduction to the new mainframe zOS Basics", downloadable at http://www.redbooks.ibm.com

The *Job Control Language* (JCL) is used to execute programs and assign their parameters. Therefore you can also compile and link a source code when you start the right jobs.

JCL contains three basic statements:

Job   General Information about your job. For example
            the Job Name and the Space which is to allocate for this job.
            (look at the job card on page 28)
Exec   here you can execute programs / start jobs and procedures
DD   This means DataDefinition, the right place to set Inputs and
            Outputs for execution

To execute a program named „Mainframe", you have to type:

```
//STEPNAME  EXEC  PGM=MAINFRAME
```

Parameters are delivered by typing a "," after the program name followed by the name and the value of your parameter.

For example:

```
//STEPNAME  EXEC  PGM=MAINFRAME,
                    INFILE='Project.Group.Type(member)'
```

JCLs can easily become very huge after adding a few characteristics and abilities. So it would not be very efficient if every programmer had to type the whole code. JCL contains procedures which are a kind of libraries or macros. You only have to call a procedure and deliver their parameters in your JCL to use the code which is already written.

For example:

```
//STEPNAME       EXEC        PROC=PROCNAME
```

note: compilers on zOS are JCL-Procedures

You can declare every dataset as JCL library. The JCL library is the location where the system tries to find your chosen procedure (members)

For example:

```
//STEPNAME  JCLLIB     ORDER=Project.Group.Type
```

The DISP parameter is very important! You can use it to define how to handle old datasets. For example you could overwrite an existing dataset or create a new one. Please read through the chapter 6.3 included in the IBM RedBook "Introduction to the new mainframe zOS Basics" which is downloadable at http://www.redbooks.ibm.com to have the ability to do master this lab.

Compile and link a C-source code

1.) Allocate required datasets

Datasets are reserved storage resources, which are filedl with members (files) later. At first allocate three datasets.
One dataset named "ude00xx.ccomp.c", a second named "ude00xx.ccomp.cntl" and a third named "ude00xx.ccomp.load". Use your ISPF-skills to find the required submenu. You can enter the values in 2 ways. You either enter your values in the section called: "ISPF-Library" or you enter your values in the section called: "other partitioned, sequential or VSAM Data Set". If you choose the second way, you have to enter your values in apostrophe like the screenshot shows below. If you do not do this, the First Level Qualifier will be attached in front of your choosen projectname.
For Example:"ude00xx.ude00xx.ccomp.c".
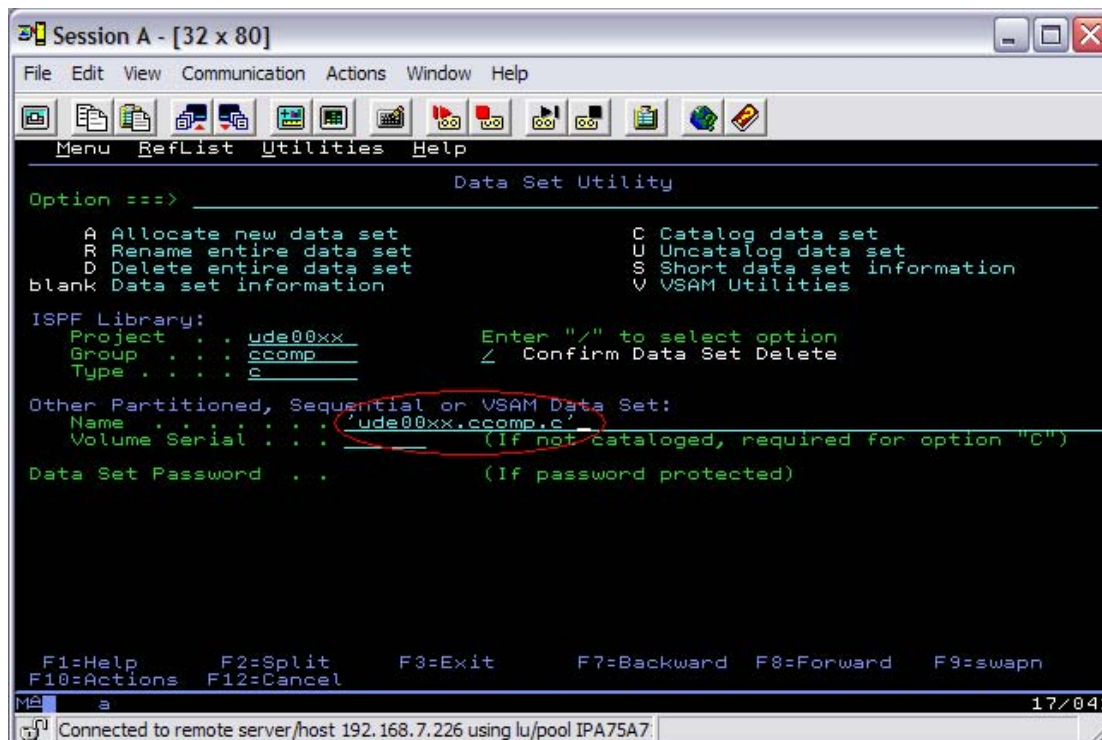
When you entered the values for "Project", "Group" and "Type", you will be forwarded to the next submenu where you have to enter several things like "space units" or record blocks" to specify your dataset.
For the first and second dataset please inherit the values that are shown in the screenshot below. For the load dataset please change the record format from "fixed block" into "undefined". For that you have to enter a "U" in the gap.
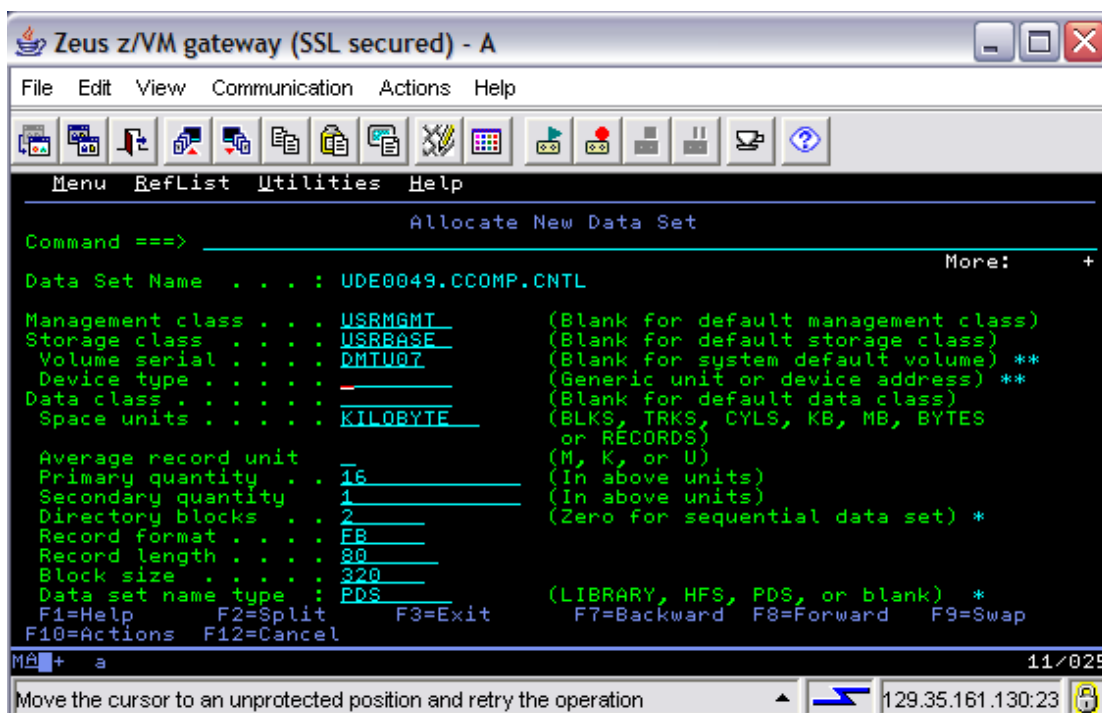
For further information about the several types of datasets and their characteristics read through the pages about Datasets (chapter 5) in the IBM RedBook "Introduction to the new mainframe zOS Basics" which is downloadable at http://www.redbooks.ibm.com

Now you have successfully allocated your first datasets.
These datasets should perform several tasks. The dataset "ude00xx...c" is the dataset for your source code whereas the "ude00xx..load" dataset should receive your compiled data. The third dataset "ude00xx..cntl" contains the JCL to submit the job.
In the next steps you should prepare these datasets for their tasks.

2.) Write your c-source

Before you are able to type any code, you have to create a member inside the "ude00xx..c" dataset. Use your ISPF-skills to find the required submenu and call the member "source".

Now you can edit this member and insert your source code.
Write an easy "hello mainframe'" program and save this member.

3.) Write your JCL

When you finished this step, please continue with the "ude00xx..cntl"-Dataset. Create a member as you did it before and call this member "ccompile".
This is the JCL which will execute your compiler. Please use the Jobcard shown below.
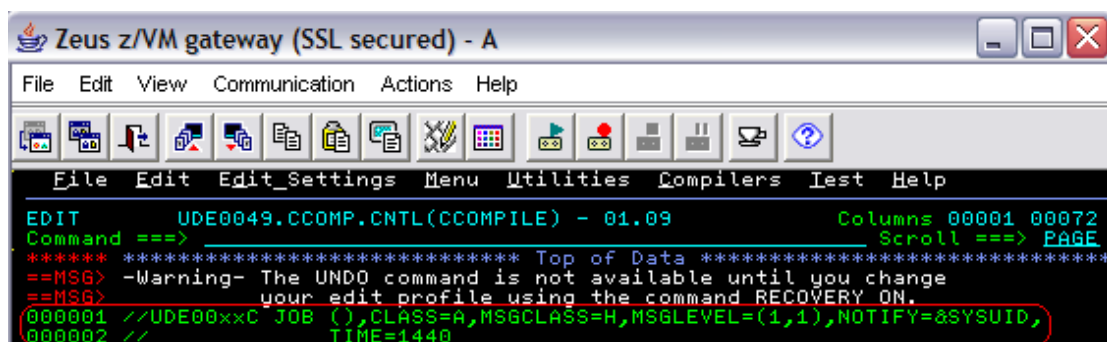
2.1) Find and link a compiler

Now you have to find a compiler on zOS, which is a JCL as well as your written Job during the optional task 4 and the JCL you would like to write at the moment.

That JCL is named: EDCCB and it is stored at "CBC.SCBCPRC".

Try to find this JCL and use the skills you have gained in the chapter "further JCL instructions" to link it into your compiling JCL.

2.3) Execute the compiler

Use the JCL skills you have gained in the chapter "further JCL instructions".

3.) Submit the job

Submit the Job as you have learned during the first labs.
If you get a "0" status → congratulations.
If not → try to fix it, and read the log
If you won`t get a "0" either → ask a course instructor

4.) Execute the file check the output

You only have to enter "call" in front of your compiled file to execute it.

Congratulations!!! You did it!!! :-)

Logging Off

When you are ready to finish your class and log out from the test system please use the following routine:

- Press F3 (Exit) repeatedly until you see the following screen or a black screen with READY prompt.

- TSO created a logfile for you and now asks you what to do with this file
- Please choose Option 2 and press enter (your logfile will be deleted)
- On the ready prompt please type LOGOFF and press enter
- Now you can close the open window
- On the Browser window please press the Log Off Button in the Java field

Thank you!