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SAP Kernel 7.20 (7.02 – ERP 6.05) ... alles steht Kopf

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Overview ...

- ▶ Kernel Overview – which kernels are used where ?
- ▶ What has changed ? ... Quite a lot ...
- ▶ How to copy a kernel ?
- ▶ How to load or patch a kernel ?
- ▶ Patch online with SAPCPE 😊
- ▶ SAPHOSTAGENT, SAPOSCOL, SAPILED, etc.

Which Kernels do Exist ?

- ▶ 7.00 based systems => Kernel 7.00
- ▶ 7.01 based systems => Kernel 7.01 (e.g. ERP 6.04)
- ▶ 7.02 based systems => Kernel **7.20** (e.g. ERP 6.05)
=> there is NO 7.02 kernel !
- ▶ 7.03 based systems => Kernel 7.20 ?

- ▶ All kernels still do exist as ASCII & Unicode
=>
There is no requirement from SAP for „pure latin-1 customers“ to move to Unicode 😊
- ▶ General information:
Note 1078134 - IBM i: Distribution of ILE and PASE system components

Kernel Overview

Solutions (e.g.ERP) Technology (NW) (end of extended maintenance)		46C 46C (03/13)	471 620 (03/13)	500 640 (03/13)	600 700 (12/17)	604 701 (12/17)	605 702 (12/17)	710 710 (12/17)	711 711 (12/17)	720 720 (12/17)	730 730 (12/17)
Original Kernel	SAP rel	46C	620	640	700	701	720	710	711	720	720
	IBM i min	V4R4	V5R1	V5R2	V5R3	V5R4	V5R4	V5R4	V5R4	V5R4	6.1
	IBM i max	V4R5	V5R3	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1
Compatible Kernel	SAP rel	46D	640	-	-	-	-	-	-	-	-
	IBM i min	V4R4	V5R2	-	-	-	-	-	-	-	-
	IBM i max	V5R2	7.1	-	-	-	-	-	-	-	-
Mntenance Kernel	SAP rel	EXT	EX2	EX2	-	-	-	-	-	-	-
	IBM i min	V5R1	V5R3	V5R3	-	-	-	-	-	-	-
	IBM i max	7.1	7.1	7.1	-	-	-	-	-	-	-

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End of Extended Maintenance will be increased to most likely 2022 ☺

What's about AKK / DCK Kernels ?

- ▶ When will SAP deliver a „downward compatible kernel“ ?
- ▶ ... hard to say, as this gets postponed since at least 3 years now ...

- ▶ BUT:
Note 1616251 - Downward Compatible Kernel 720 Pilot Project

- => So, SAP is obviously really on the track to release a AKK/DCK kernel for all the 7.x releases ;-)

- ▶ As the pilot program application ended at october, 15, this might be a thing for 2012 ...

- ▶ Additionally, the DCK Kernel is available now already ;-))
Note 1636252 - Installing a 7.20 kernel in SAP Web AS 7.00/7.01/7.10/7.11

What has changed with 7.20 I ?

- ▶ EVERYTHING ...

- ▶ Oh no, not everything ... it is still the really nice PASE (AIX) kernel, that is used since 6.40 technology

- ▶ In the past, the kernel was based in a library and you could copy this one around. This has now significantly changed, as the kernel is in the IFS now and only a few parts are copied (automatically) to the ILE „kernel“-library (where no kernel is in anymore!)

- ▶ So, the copying of kernels has changed !
 - Note 1097636: Kernel copy on IBM i for SAP Kernels 7.00
 - Note 1298623: Kernel copy on IBM i for SAP Kernels 7.01
 - Note 1097637: Kernel copy on IBM i for SAP Kernels 7.10++

What has changed with 7.20 II ?

- ▶ APYSIDKRN – the new tool for „everything“ ;-)
... it replaces LODSAPKRN, APYR3FIX & APYSAP
- ▶ R3INLPGM got switched to SAPINLPGM
- ▶ Environment variable CLASSICUSERCONCEPT sometimes needed
- ▶ saphostexe is a nice tool – with saposcol as well ...
(older already, but will now be coming to every customer)
- ▶ sapstartsrv for all platforms ... (older but rarely known only)
- ▶ SAPILED is a great SAP daemon (server job), that updates the ILE part of a kernel based on timestamps

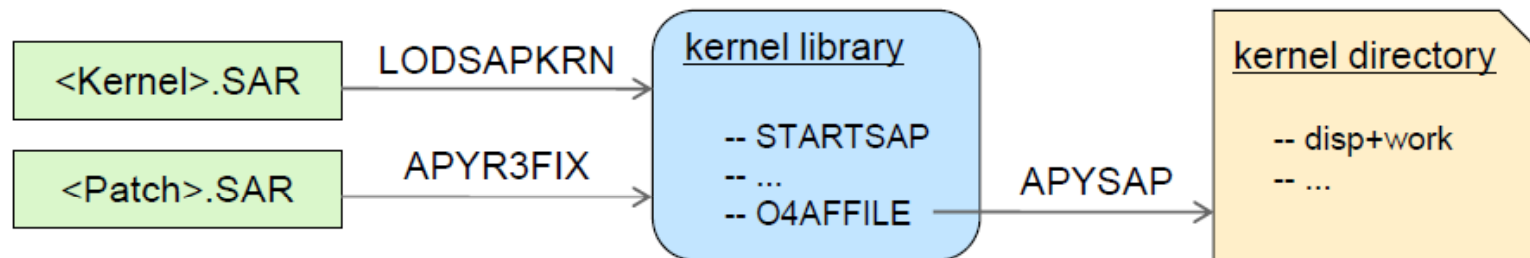
What has changed with 7.20 III ?

- ▶ The name of the ILE „kernel“ library is „hardcoded“ and typically SAP<SID>IND
=> Therefore, you can no longer „share“ kernels between different SAP systems (on the other hand this library doesn't contain a kernel anyway)
- ▶ You patch a kernel at any time and during the next SAP restart it automatically updates itself – even 3-tier 😊
- ▶ The size of the kernel shrunk down from about 1500MB to 350 MB
- ▶ Name of the subsystem R3_nn got renamed to SAPnnSID
(this is one of the processes to try to remove the word „R3“ more and more even when this might never finish e.g. for R3<SID>DATA)

Old Kernel Structure (<= 7.01)

The old kernel administration separated kernel library and kernel directory

The complete kernel can be rebuilt from the kernel library (“library-centric”)



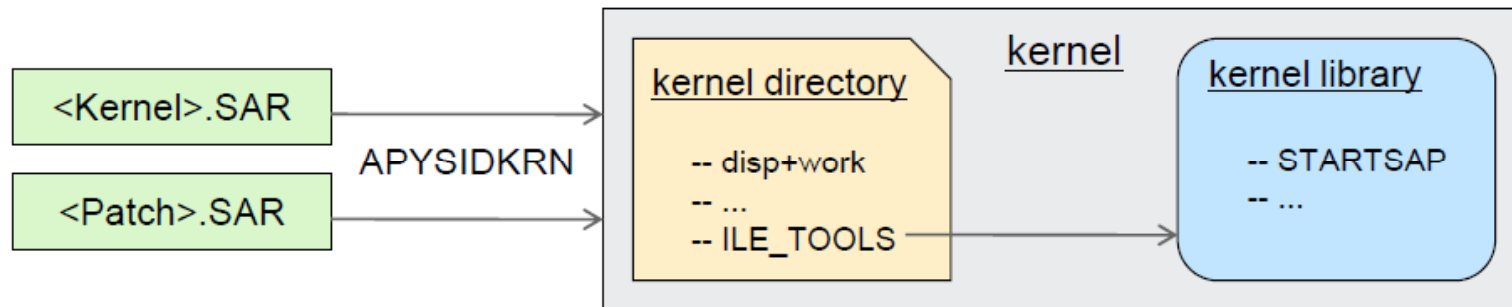
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- ▶ Note 1078134: Kernel Structure on IBM i in general
- ▶ Note 1097600: Kernel Structure on IBM i for SAP Kernels 7.00/7.01

New Kernel Structure (>= 7.02)

The new kernel administration handles the complete kernel as one unit

The complete kernel can be rebuilt from the kernel directory (“directory-centric”)



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- ▶ Note 1078134: Kernel Structure on IBM i in general
- ▶ Note 1097751: Kernel Structure on IBM i for SAP Kernels 7.10++

How to Copy a Kernel in 7.20 I ?

▲ Source System (here: DEV)

- CHGCURDIR '/sapmnt/DEV/exe'
- SAPCAR PARMLIST('-cvf /tmp/DEV_IFS-Kernel.SAR .')
(be aware of the „.“ (dot) at the end !)
- SAVLIB LIB(SAPDEVIND) DEV(*SAVF) SAVF(QGPL/KERNELILE)
- SAVLIB LIB(SAPDEVIND0) DEV(*SAVF) SAVF(QGPL/KERNELMENU)
(the lib, that is in the libl as „menu lib“ – could be 1 or 2 at the end as well)

How to Copy a Kernel in 7.20 II ?

▶ Target System (here: QAS)

- RSTLIB SAVLIB(SAPDEVIND) DEV(*SAVF) SAVF(QGPL/KERNELILE)
RSTLIB(SAPQASIND)
- RSTLIB SAVLIB(SAPDEVIND0) DEV(*SAVF) SAVF(QGPL/KERNELMENU)
RSTLIB(SAPQASIND0)
- DLTDTAARA DTAARA(SAPQASIND/MENUS)
- CRTDTAARA DTAARA(SAPQASIND/MENUS) TYPE(*CHAR) LEN(10)
VALUE(SAPQASIND0) TEXT('MENU library for QAS') AUT(*ALL)
- CHGJOB CCSID(500)
- APYSIDKRN SID(QAS) ARCHIVES('/tmp/DEV_IFS-Kernel.SAR')
CARPATH('/usr/sap/QAS/SYS/exe/run') MODE(*FULLY)
LOGPATH('/tmp/APYSIDKRN.log')

▶ More information is available at:

Note 1097637 - IBM i: Copying an SAP kernel (710++)

Note 1432807 - IBM i: Applying a saved kernel using APYSIDKRN

Loading / Patching a Kernel I

- ▶ Log on with e.g. sidadm
- ▶ Place the PASE Version of SAPCAR to /tmp (e.g. SAPCAR_2-20005270.EXE of the patch directory)
- ▶ Place SAPEXE.SAR & SAPEXEDB.SAR or the needed patch to /tmp
- ▶ APYSIDKRN SID(<SID>
 ARCHIVES('/tmp/SAPEXE.SAR' '/tmp/SAPEXEDB.SAR')
 MODE(*FULLY) CARPATH('/tmp')
- ▶ This places the patches to the /usr/sap/<SID>/SYS/exe/run
(if you applied note 1632754, you can do this while SAP is active)
- ▶ The apply then happens with SAPCPE during the next SAP restart 😊
- ▶ A very good exact description of APYSIDKRN is available at:
Note 1632755 - IBM i: Description of command APYSIDKRN 😊

Loading / Patching a Kernel II

- ▶ As the kernel is now lying in the IFS as on all other platforms, you could even patch it in the IFS with SAPCAR directly ... (in case of issues only !)
- ▶ Log on with QSECOFR and CALL PGM(SAP<SID>IND/SAPINLPGM)
- ▶ CALL PGM(QP2TERM)
- ▶ cd /usr/sap/<SID>/SYS/exe/run
- ▶ /usr/sap/<SID>/DVEBMGSyy/exe/SAPCAR -xvf /tmp/SAPEXE.SAR
(here you have to ensure, that SAPCAR doesn't overwrite „itself“ – therefore, we do use the active version here ...)
- ▶ FIXSAPOWN SID(PRD)
- ▶ Or even better:
 - Note 1177123 - IBM i: Setting up a destroyed kernel library again**
 - Note 1097751 - iSeries: Info & recommendations for kernel libraries (710++)
 - Note 1632754 - IBM i: Switch to instance specific directory

Patch Online with SAPCPE ...

- ▶ SAPCPE – known on windows for ages – is now available for all platforms
- ▶ That supports 2 directories for the kernel:
 - Kernel „mother“ directory for all application servers (even remotely mounted)
DIR_CT_RUN = /usr/sap/<SID>/SYS/exe/run
(typically mounted/linked via /sapmnt/<SID>/exe)
 - „Active“ Kernel directory, that is used while SAP is running
DIR_EXECUTABLE = \$(DIR_INSTANCE)/exe
(e.g. /usr/sap/<SID>/DVEBMGSnn/exe)
- ▶ With this setup above, you can now activate SAPCPE as follows:
Execute_xx = immediate \$(DIR_CT_RUN)/sapcpe pf=\$(_PF)
- ▶ As DIR_CT_RUN gets patched, but DIR_EXECUTABLE is used, you can do this online and SAPCPE “activates” the kernel during the next SAP restart
- ▶ For more information have a look at:
Note 1632754 - IBM i: Switch to instance specific directory

Issues with the kernel ...

- ▶ You should have a look at the following notes ...
- ▶ Note 1045022 - Job hangs: CLASSICUSERCONCEPT not set
- ▶ Note 1097637 - IBM i: Copying an SAP kernel (710++)
- ▶ Note 1097751 - iSeries: Info & recommendations for kernel libraries (710++)
- ▶ Note 1177123 - IBM i: Setting up a destroyed kernel library again
- ▶ Note 1432807 - IBM i: Applying a saved kernel using APYSIDKRN
- ▶ Note 1499408 - IBM i: Installation Fails Due to Incomplete Kernel Update
- ▶ Note 1589608 - IBM i: Saving the programs after an action with APYSIDKRN
- ▶ Note 1509893 - IBM i: Logon impossible - Menu library missing

SAPINLPGM instead of R3INLPGM

- ▶ R3INLPGM was and is located in library R3<SID>400
- ▶ It was used to generate a „SAP environment“
- ▶ It needed to be in a special library, as the kernel library was free of choice
- ▶ Now, the kernel lib should always be SAP<SID>IND – therefore, it would be easy possible to create the SAP environment as follows:
CALL PGM(SAP<SID>IND/SAPINLPGM)
- ▶ Here you see the future strategy as well ...

```
RtvSidCfg: PRD system info status is OK.  
R3PRD400/R3INLPGM: Call was processed; but next time use: CALL  
PGM(SAPPRDIND/SAPINLPGM)
```

Environment Variable CLASSICUSERCONCEPT

- ▶ What is the meaning of this new environment variable ?
 - As the kernel is a 7.20 kernel, it has to support systems up to 7.02 on the one hand and systems with release 7.10 and higher on the other hand.
 - In 7.10 the user concept was redesigned and switched to the Unix concept with e.g. <SID>ADM as user for the work processes instead of <SID><nn>.
 - For all systems up to 7.02, you are still using the classical concept and therefore need to set this variable to „Y“

- ▶ More information is available at:
 - Note 834218 - iSeries: Operating system users for SAP on iSeries (classic)
 - Note 1045022 - Job hangs: CLASSICUSERCONCEPT not set
 - Note 1123501 - System i: Operating system user for SAP on System i (new)
 - Note 1149318 - User concept conversion using tool CONVUSRCPT
 - Note 1460175 - IBM i: CONVUSRCPT supports new option *CHECK

SAPHOSTAGENT ...

- ▶ SAPHOSTAGENT is a toolset, that supports e.g. the following services
 - SAPOSCOL – Collector for OS data for easy SAP access
 - SAPILED – Daemon for syncing the IFS Kernel to the library
 - SAPSTRSRV – Web based Management Tool for SAP for all platforms
- ▶ SAPHOSTEXE runs in subsystem QUSRWRK as autostart job
- ▶ Further information is available at:
Note 1031096 - Installing Package SAPHOSTAGENT

SAPHOSTAGENT on iSeries

```

Mit aktiven Jobs arbeiten
SAP01
16.10.11 21:48:30
CPU %: 94,9 Abgelaufene Zeit: 00:00:36 Aktive Jobs: 498
Aktueller
Opt Subsystem/Job Benutzer Art CPU % Funktion Status
___ QUSRWRK QSYS SBS 0,0
___ QGYSERVER P01ADM BCH 0,0
___ QSCICEV QSYS BCH 0,0
___ QSCWCHMS QUSER BCH 0,0
___ QZDASOINIT QSECOFR PJ 0,0
___ QZHQSSRV QSECOFR PJ 0,0
___ QZRCSRVS QSECOFR PJ 0,0
___ QZRCSRVS QSECOFR PJ 0,0
___ QZRCSRVS QSECOFR PJ 0,0
___ SAPHOSTEXE QSECOFR BCI 0,0 PGM-saphostexe SELW
___ SAPHOSTEXE QSECOFR BCI 0,0 PGM-saphostexe THDW
___ SAPHOSTEXE QSECOFR BCI 0,0 PGM-saposcol DEQW
___ SAPILED QSECOFR BCH 0,0 PGM-SAPILED SIGW
___ SAPSTRSRV CONADM BCH 0,0 PGM-sapstartsr THDW
___ SAPSTRSRV P01ADM BCH 0,0 PGM-sapstartsr THDW

```

- ▶ Here you see the jobs, started by SAPHOSTEXE ...
- ▶ It seems to be „the first time“, that SAPOSCOL is pretty stable now ;-))
- ▶ Weekly (or even more often) patches are showing up – but are not needed
- ▶ Easy upgrade of this toolset

SAPILED – ILE Daemon for Easy Kernel Update

- ▶ SAPILED checks permanently, if the IFS kernel changed and therefore the ILE library would be outdated
- ▶ In case of an outdated ILE „kernel“ library, SAPILED spawns a new job that does the complete update from the IFS file ILE_TOOLS to the ILE library
- ▶ This takes 10-30 minutes as the contents needs to be converted and therefore recompiled often

SAPSTARTSRV - SAP Management Console

The screenshot displays the SAP Management Console interface. On the left, a tree view shows the system hierarchy: SAP Systems > P01 > Database > DVEBMGS10 on sap01 > Process List > AS ABAP WP Table. The main area shows a table of process details for the selected 'AS ABAP WP Table(32)'.

Number	Type	Pid	Status	Reason	Start	Err	Sem	Cpu	Time	Program	Client	User	Action	Table
0	DIA	1176	Wait		yes			0.43.41						
1	BTC	4684	Run		yes			24:57:39	1447	SAPLS...	100	TIMPERT	Insert	RFBLG
2	BTC	2800	Stop	UPD	yes	1		14:10:00	18165	SAPLT...	100	SCHUE...		
3	BTC	4996	Run		yes			16:41:30	1195	SAPLS...	100	TIMPERT	Insert	BKPF
4	BTC	5376	Wait		yes			0:01:09						
5	DIA	1384	Wait		yes			0:11:53						
6	DIA	5824	Wait		yes			0:29:38						
7	DIA	2600	Wait		yes			0:03:27						
8	DIA	264	Wait		yes			0:00:15						
9	DIA	3152	Wait		yes			0:00:05						
10	DIA	4160	Wait		yes			0:00:00						
11	DIA	5772	Wait		yes			0:00:00						
12	DIA	5044	Wait		yes			0:00:00						
13	DIA	4780	Wait		yes			0:00:00						
14	DIA	5092	Wait		yes			0:00:00						
15	DIA	3720	Wait		yes			0:00:00						
16	UPD	4952	Run		yes			1:44:38			100	SCHUE...	Commit	
17	UPD	3352	Run		yes			0:42:11	1	SAPLF0...	100	SCHUE...	Direct R...	BKPF
18	UPD	4592	Wait		yes			0:20:33						
19	UPD	3292	Wait		yes			0:08:11						
20	UPD	2536	Wait		yes			0:01:50						
21	UPD	2688	Wait		yes			0:00:11						
22	UPD	5872	Wait		yes			0:00:01						
23	UPD	6008	Wait		yes			0:00:00						
24	UPD	6040	Wait		yes			0:00:00						
25	UPD	6076	Wait		yes			0:00:00						
26	BTC	2400	Wait		yes			0:00:10						
27	BTC	5636	Wait		yes			0:00:00						
28	BTC	4892	Wait		yes			0:00:00						
29	BTC	5556	Wait		yes			0:00:00						
30	BTC	2528	Wait		yes			0:00:00						
31	BTC	5720	Wait		yes			0:00:00						

- ▶ You can start this with each browser as follows: <http://<server>:5nn13>
- ▶ Further information: Note 936273 - sapstartsrv for all platforms

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CON~~PL~~**IMMENT!**

THANK YOU FOR YOUR ATTENTION ...

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