



Presentation
**The 2007
International
Rexx
Symposium**
30 April
3 May
2007
**Tampa
Florida
USA**

Job Processing System

Morten Mork YX Energi Norge AS mork.morten@gmail.com

History

Overview

The Console & The Environment

Scheduling & Jobs

Logging & Accounting

Case Studies

Questions



History

Bossman And The Slaves

VSE Machines and partitions
resource table



ProdVSE.F5
ProdVSE.F6
BatchVSE.F3
BatchVSE.F4
TestVSE.F4
TestVSE.F5

CMS Machines
resource table



Slave1
Slave2
Slave3
Slave4

Bossman

CMS

Bossman And The Slaves

Order slave To Run scriptname Using machineResource

Bossman

CMS

RexxLA 2007

Bossman And The Slaves

```
Order * To Run Backup1 Using ProdVSE.F5
Order * To Run Backup2 Using ProdVSE.F6
Order * To Run Backup3 Using TestVSE.F5
Order * To Run Backup4 Using ProdVSE.F5
Order * To Run Backup5 Using ProdVSE.F6
```

Checkpoint

```
Order Slave1 To Run Job1 Using ProdVSE.F5
Order Slave2 To Run Job2 Using ProdVSE.F6
Order Slave1 To Run Job3 Using ProdVSE.F5
Order Slave1 To Run Job4 Using ProdVSE.F5
Order Slave1 To Run Job5 Using ProdVSE.F5
```

Bossman

CMS

Bossman And The Slaves

Parse message
Read in script
result = run()
Send result to Bossman

run:
interpret script

submit:
Submit job to VSE
Wait for messages
from Bossman
Return true or false

```
if submit('BackupGL') then return 0  
else return 1
```

Bossman

CMS

Bossman And The Slaves

Parse message
Read in script
result = run()
Send result to Bossman

run:
interpret script

submit:
Submit job to VSE
Wait for messages
 from Bossman
Return true or false

```
if submit('AR') then return 0
retc = sendMsg('Must restore AR')

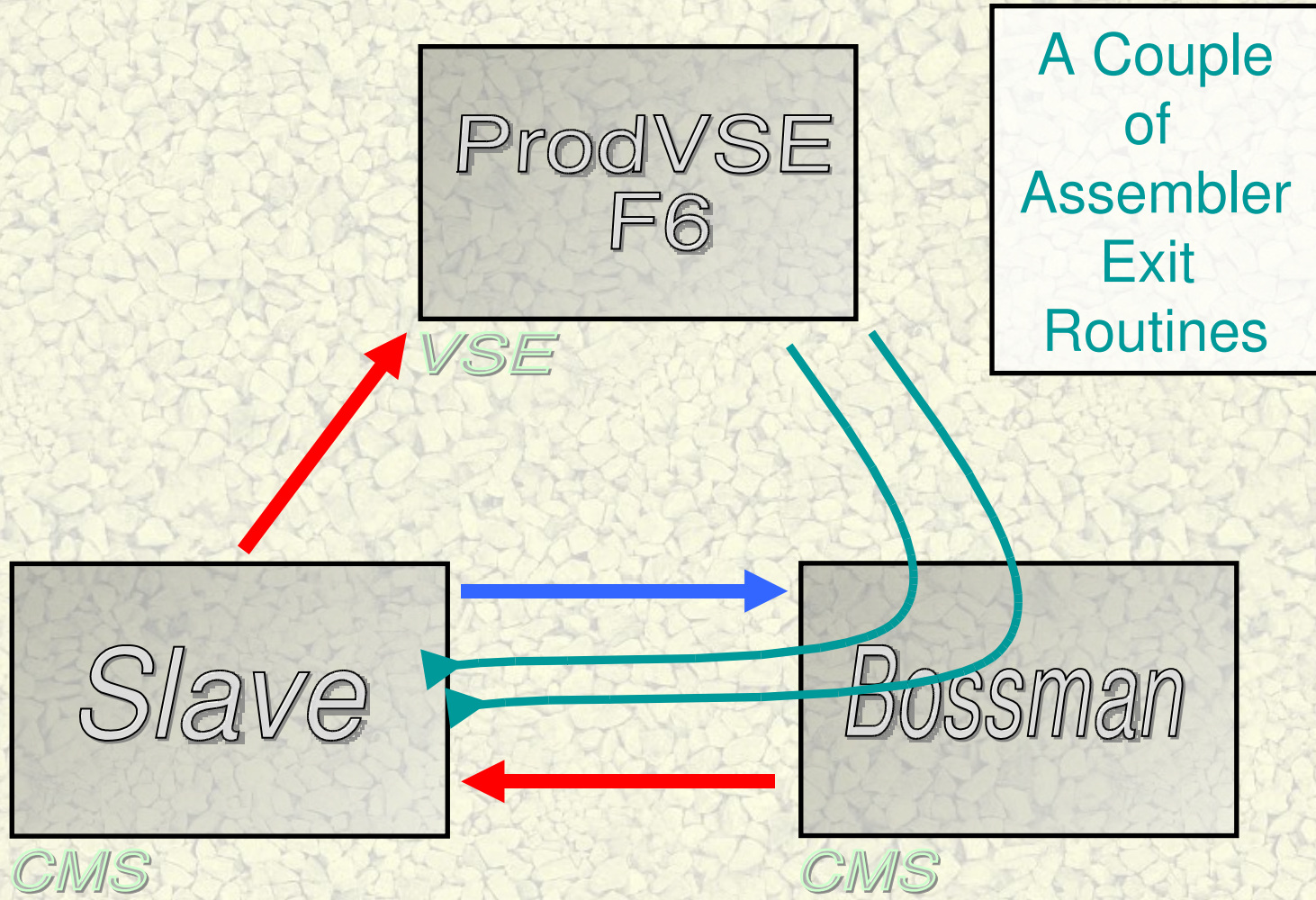
if submit('RestoreAR') then return 0
retc = sendMsg('Severe problems')

return 1
```

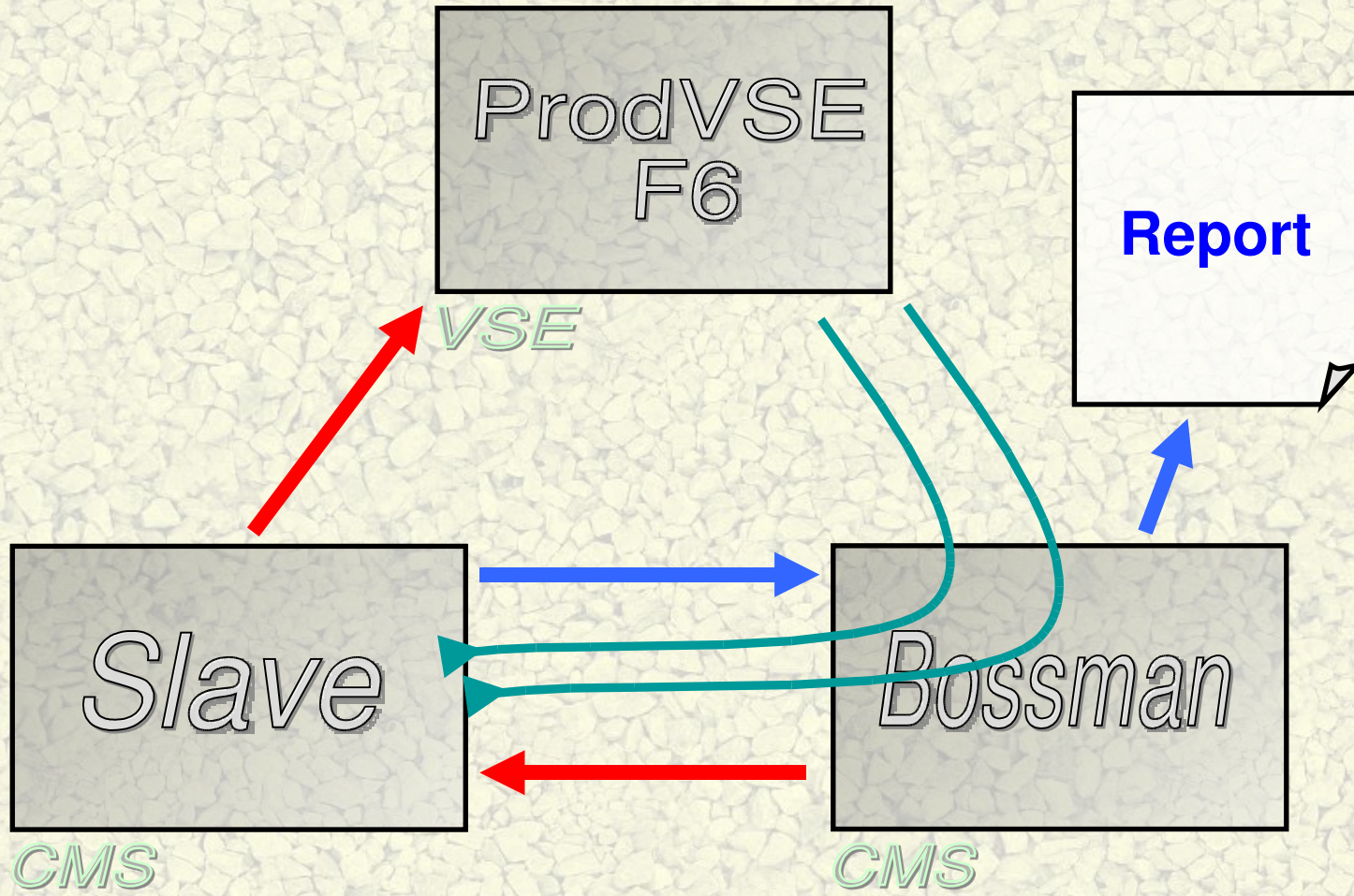
Bossman

CMS

Bossman And The Slaves



Bossman And The Slaves





OverView

Console Class

```
::class OperatorConsole

::method Wait4Message guarded
expose OperatorCommand
OperatorCommand = ""
reply ""
dummy = time('R')

do forever
  FromOperator = linein()
  if strip(FromOperator) = "" then iterate
  leave
end

OperatorCommand = FromOperator
return

::method ShowMessage unguarded
expose OperatorCommand
return OperatorCommand
```

```
Operator = .OperatorConsole~new
Command = Operator~Wait4Message

i=0
do forever
  dummy = sysssleep(0.05)
  Command = Operator~ShowMessage
  if Command \= "" then do
    if \doSomething(Command) then leave
    Command = Operator~Wait4Message
  end
  i=i+1
  if i = 100 then do
    say 'I have checked hundred times!'
    i=0
  end
  -- some more code
end
return 0

doSomething: procedure
arg toDo
say 'I have to do this:' toDo
if toDo = 'EXIT' then do
  say "I'm Leaving"
  return .false
end
-- do something
return .true
```

JPS - Overview

...and create
nodename.system.table



Establish Environment
Read in System.Table



Schedule
Start Jobs

RxQ
Messages

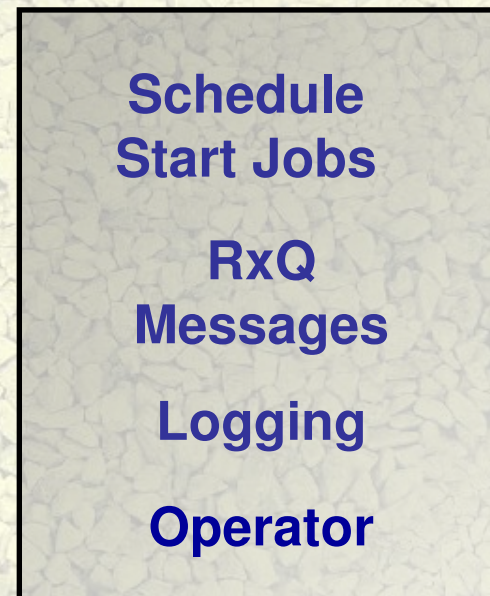
Logging

Operator

Core.rex

JPS - Overview

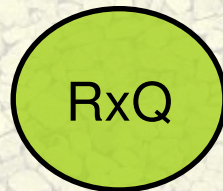
Read Schedule
Main.Schedule



Core.rex

JPS - Overview

Named Queue = "NodeName"



Establish RxQueue if
not already present

Schedule
Start Jobs

RxQ
Messages

Logging

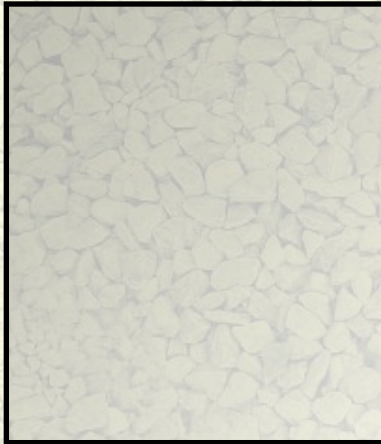
Operator

Core.rex

RexxLA 2007

JPS - Overview

JobControl.rex



Start a Job

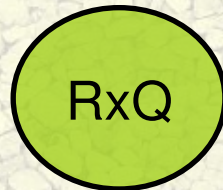


**Schedule
Start Jobs**

**RxQ
Messages**

Logging

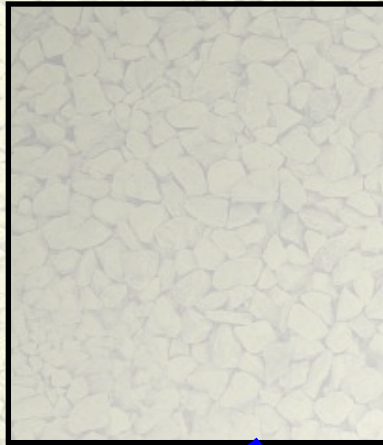
Operator



Core.rex

JPS - Overview

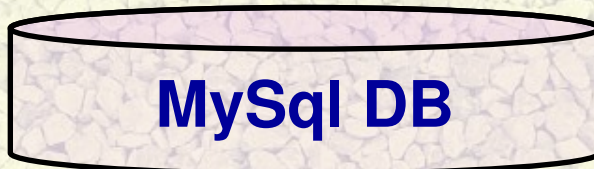
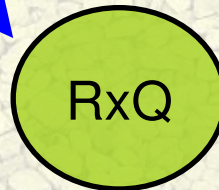
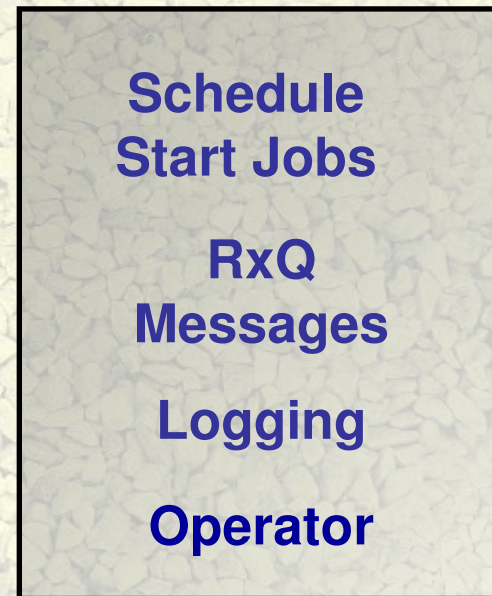
JobControl.rex



Start logging

Using RexxSql

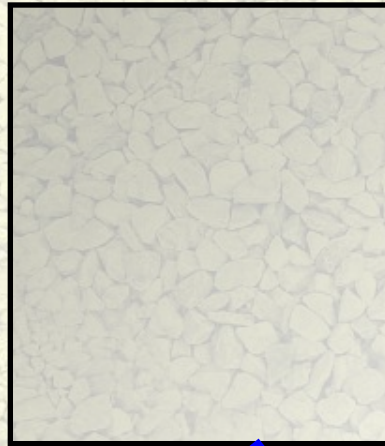
All database activities done by Core.rex



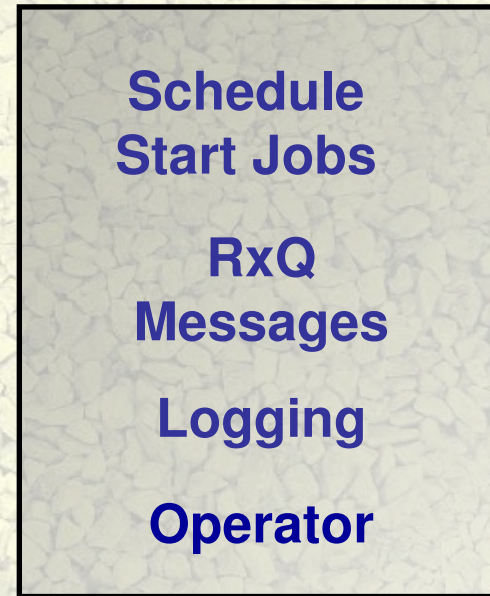
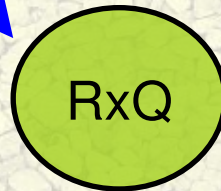
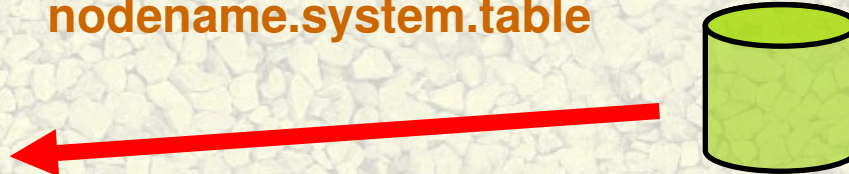
Core.rex

JPS - Overview

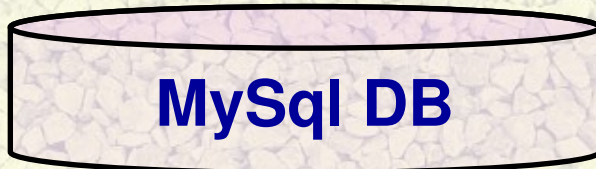
JobControl.rex



Read
nodename.system.table



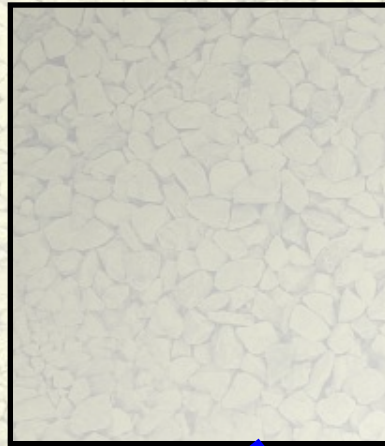
Core.rex



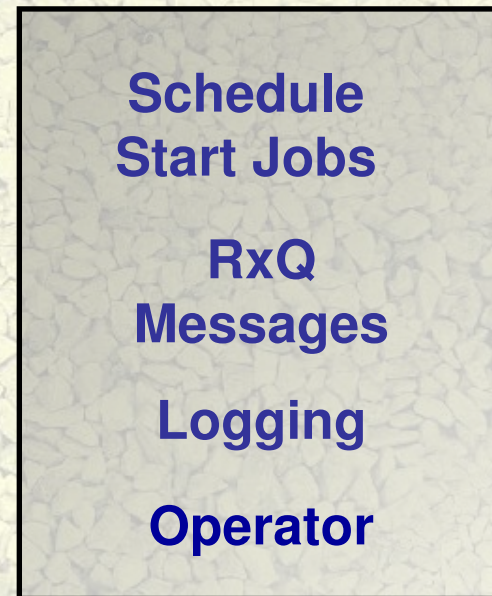
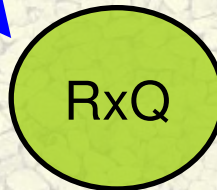
MySql DB

JPS - Overview

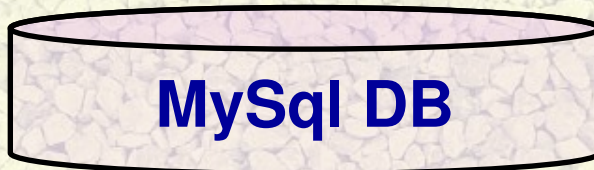
JobControl.rex



**Read
Job file**



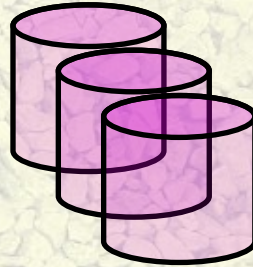
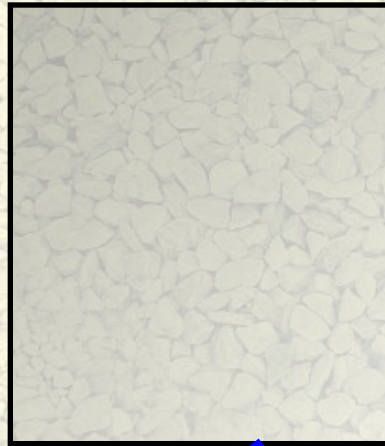
Core.rex



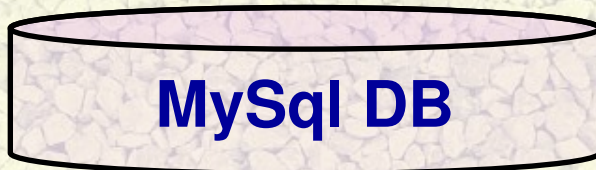
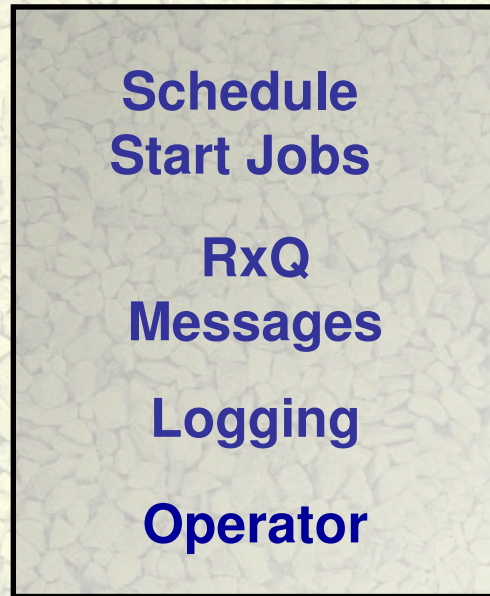
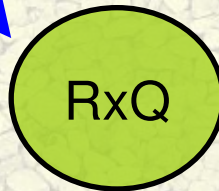
MySql DB

JPS - Overview

JobControl.rex



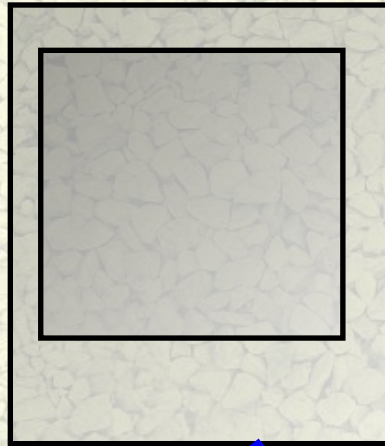
**Read zero
or more
Parameter Files**



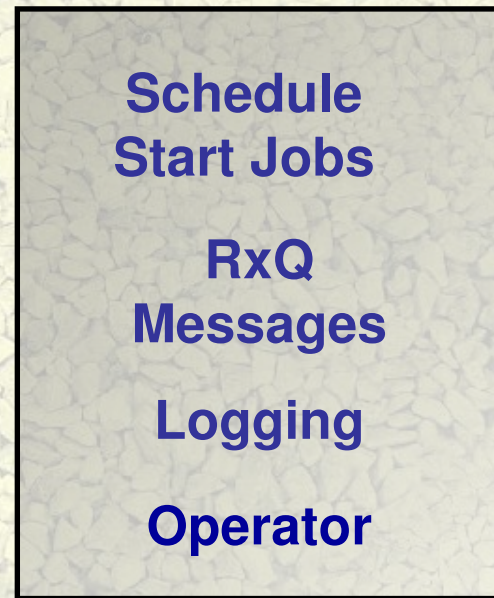
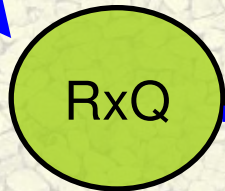
Core.rex

JPS - Overview

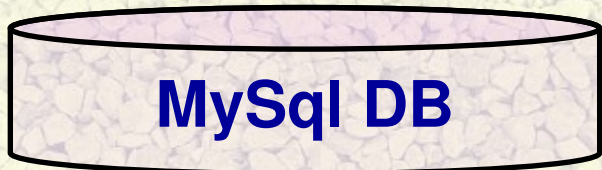
JobControl.rex



**Build Job as an
internal stem.**

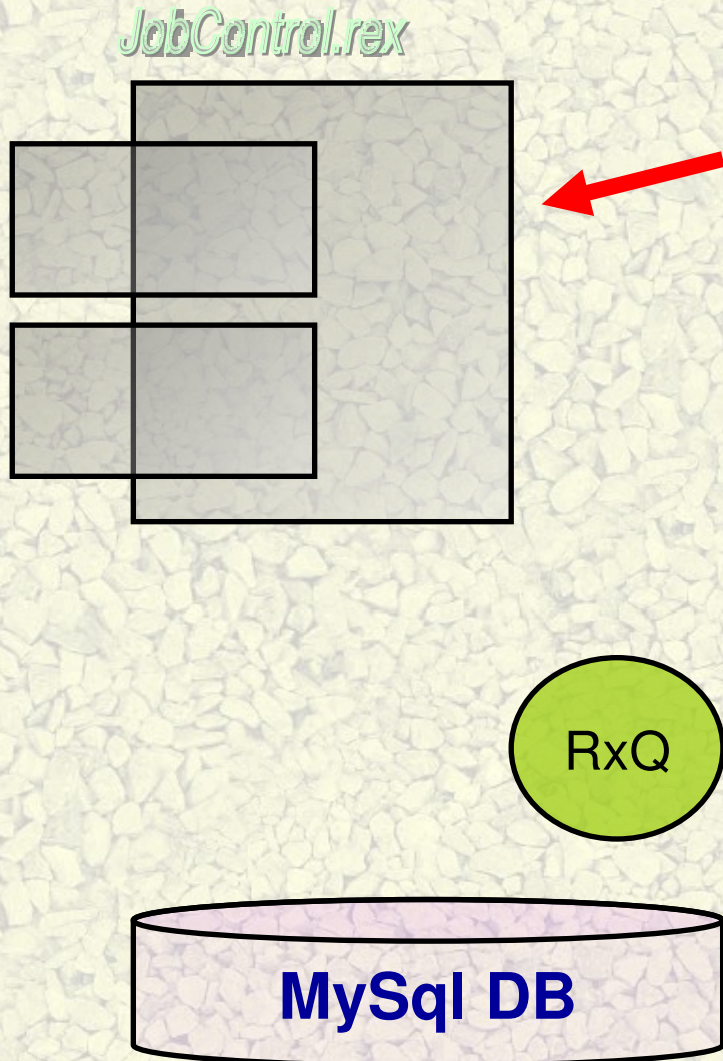


Core.rex

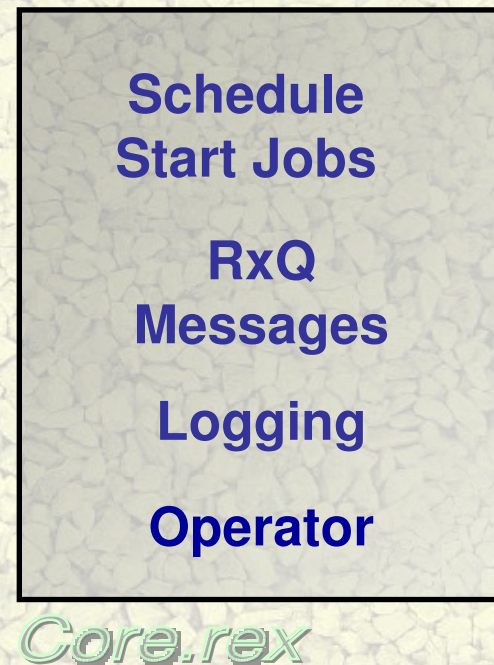


MySql DB

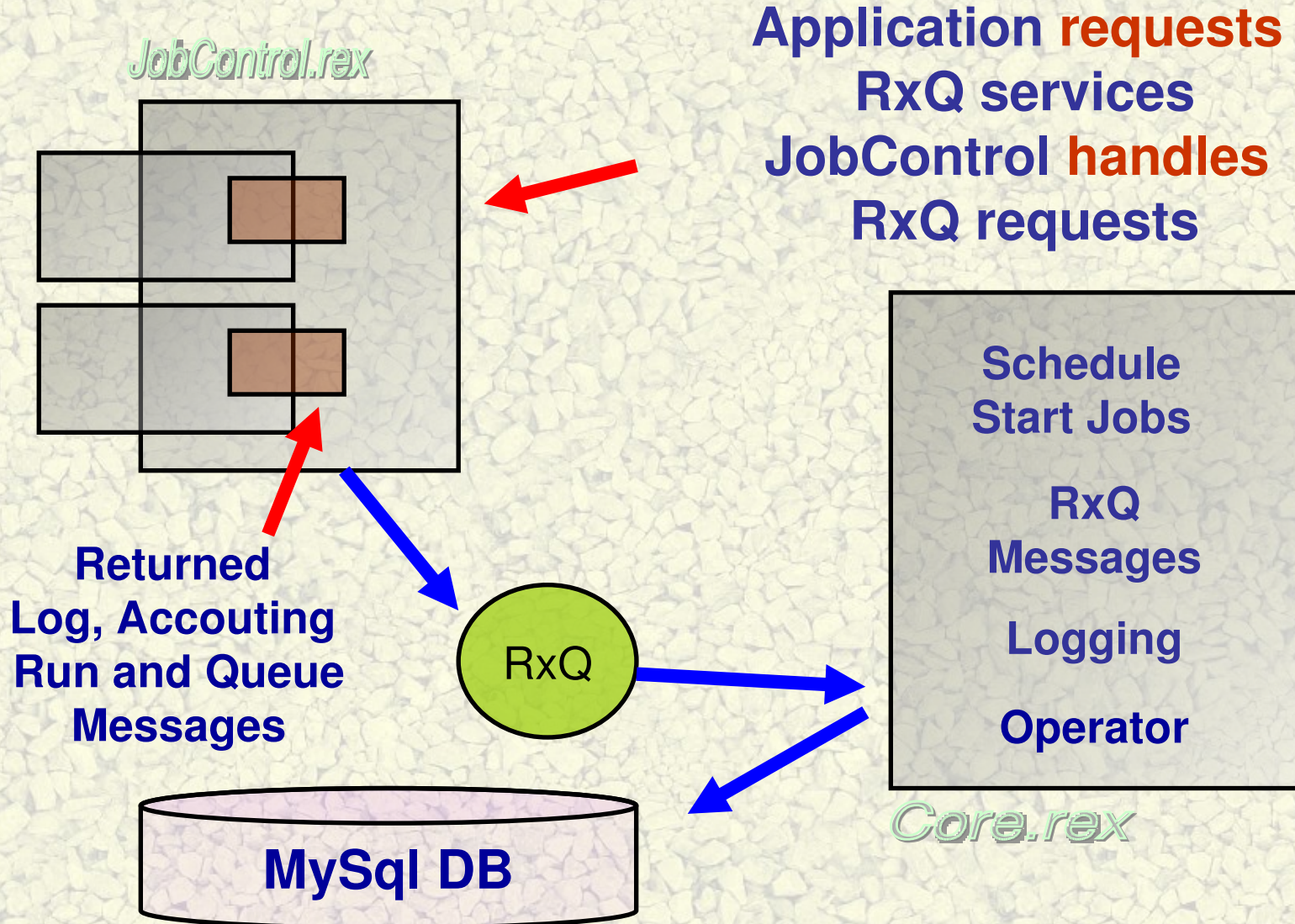
JPS - Overview



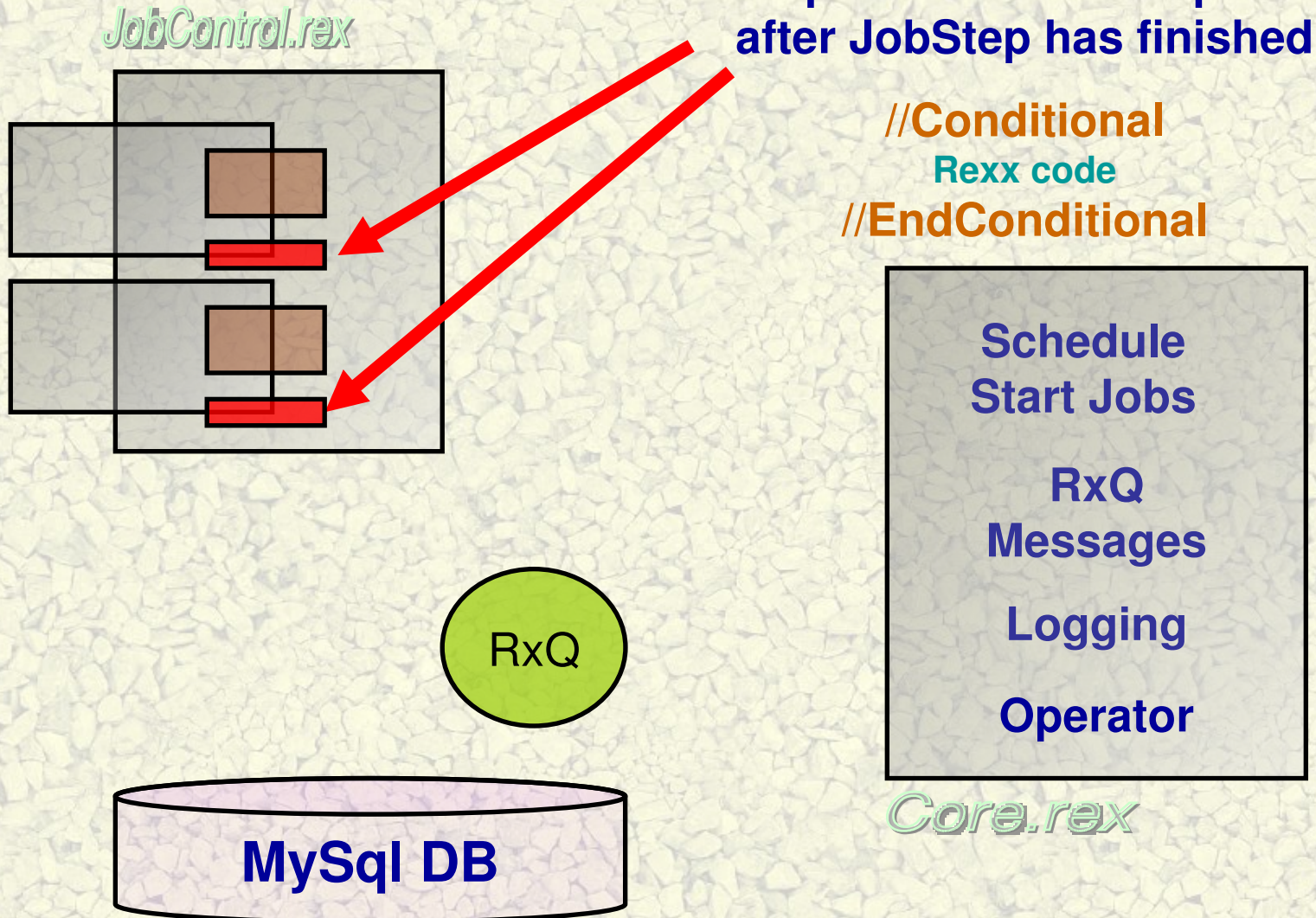
**Execute one or more
JobSteps (Applications)
One by One.**



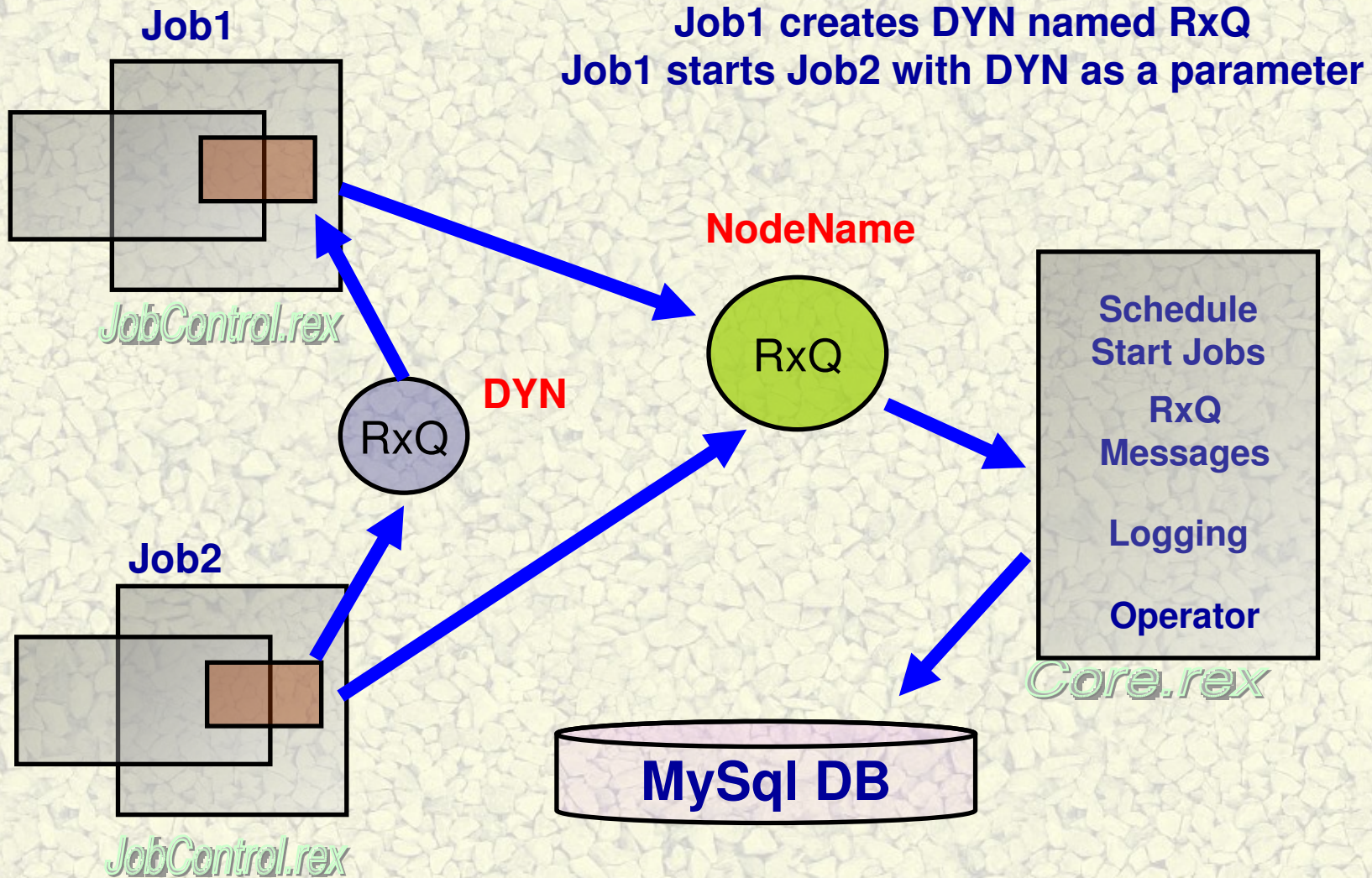
JPS - Overview



JPS - Overview



JPS - Overview



JPS - Overview

Dear ooRexx

I wish that I as an object can have my own RxQ Pointer. That this Pointer is not tampered with and taken away from me without notice

by others.

I really need this for my integrity.

I would be very thankful.

Blah,

blah, blah, blah, blah,

The Console & The Environment



The Console & The Environment

The System.Table

F2BNodeName

"KrungThep"

F2BDirectorySystem

"d:\jps1\System\"

F2BDirectoryUtilities

"d:\jps1\Utilities\"

F2BDirectoryTempArea

"d:\jps1\TempArea\"

F2BDirectoryPSW

"d:\jps1\jpsCert\"

F2BDirectoryJCLWorkArea

"d:\jps1\JclWorkArea\"

F2BDirectoryLog

"d:\jps1\JPSLOG\"

The Console & The Environment

The System.Table

F2BDataBaseUserID	"jps"
F2BDataBaseUserCert	"jps"
F2BDataBaseName	"jps"
F2BDataBaseHost	"193.212.170.138"
F2BDataBaseAccountTable	"account"
F2BDataBaseLogTable	"log"

The Console & The Environment

The System.Table

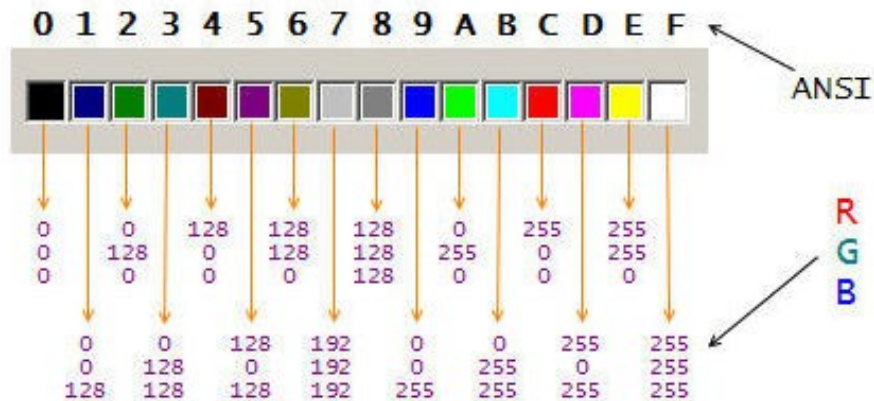
UserJobDirectory	"Dir.ProdJCL = d:\jps1\JpsUserDirs\ProdJCL\"
UserJobDirectory	"Dir.Test = d:\jps1\JpsUserDirs\Test\"
UserJobDirectory	"Dir.ProdPrograms = d:\jps1\JpsUserDirs\ProdPrograms\"
UserJobDirectory	"Dir.ProdParams = d:\jps1\JpsUserDirs\ProdParameters\"
UserJobDirectory	"Dir.Applikasjoner = d:\jps1\JpsUserDirs\Applikasjoner\"
UserSystemApplication	"App.InfoZip = d:\InfoZip\Zip\Zip.exe"
UserSystemApplication	"App.InfoUnZip = d:\InfoZip\Unzip\unzip.exe"

UserDefaultLibdef	"Dir.Applikasjoner Dir.ProdJCL"
--------------------------	--

The Console & The Environment

The System.Table

```
JpsNamedShellJobs      "kp_Wait4NewFiles, kpTest_Wait4NewFiles"  
AnsiMultiColorShell    "Yes"  
AnsiMultiColor         "0,1,2,3,4,5,6,7,8"
```

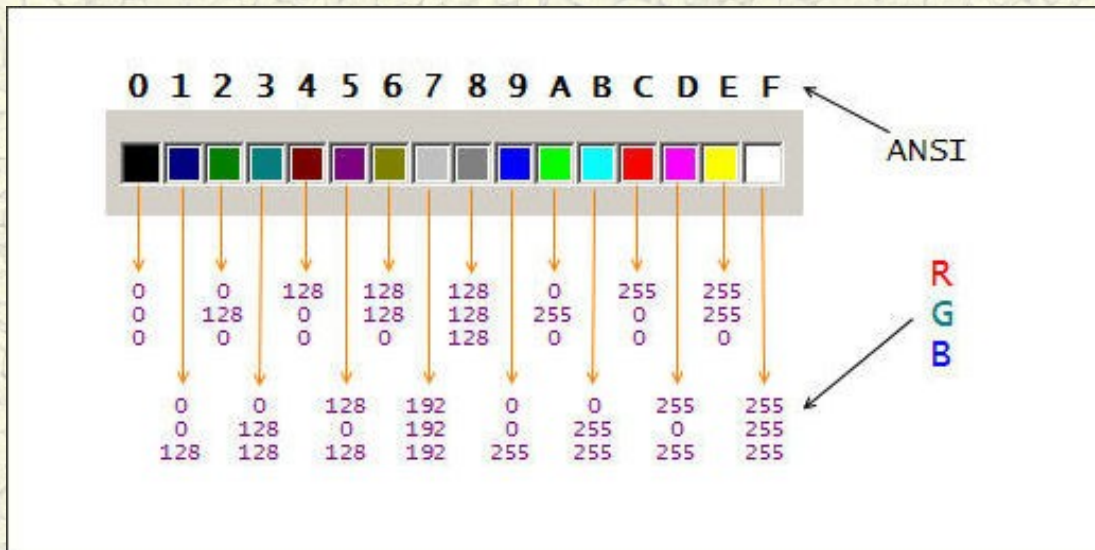


01	Blue
02	Green
03	Cyan
04	Red
05	Magenta
06	Brown
07	White
08	Grey
09	Bright Blue
0A	Bright Green
0B	Bright Cyan
0C	Bright Red
0D	Bright Magenta
0E	Yellow
0F	Bright White

The Console & The Environment

The System.Table

JpsNamedShellJobs "kp_Wait4NewFiles, kpTest_Wait4NewFiles"
AnsiMultiColorShell "Yes"
AnsiMultiColor "0,1,2,3,4,5,6,7,8"



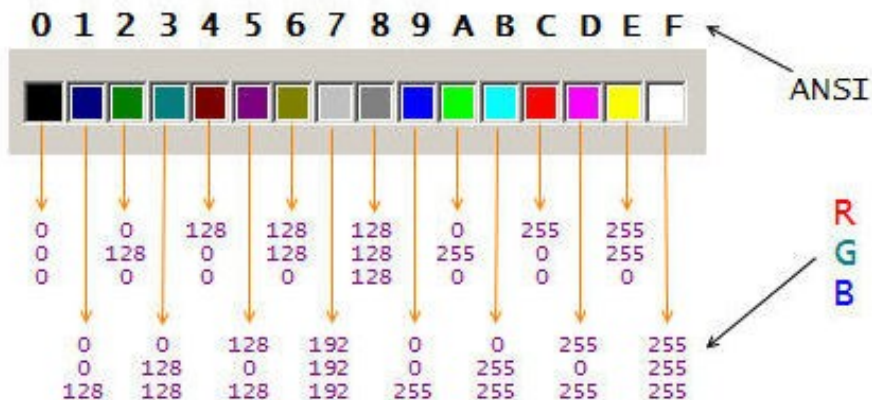
0 48,32,0
1 255,255,128
2 184,200,155
3 255,128,0
4 255,128,255
5 200,200,0
6 220,220,164
7 248,248,220
8 128,128,220



The Console & The Environment

The System.Table

JpsNamedShellJobs	"kp_Wait4NewFiles, kpTest_Wait4NewFiles"
AnsiMultiColorShell	"Yes"
AnsiMultiColor	"0,1,2,3,4,5,6,7,8"



- 1 Background
- 2 Operator input
- 3 Timestamp
- 4 Error (E) messages
- 5 Warning (W) messages
- 6 Opr og Sys information (I) messages
- 7 App information (I) messages
- 8 I (information) messages (all others)
- 9 All other messages



The Console & The Environment

```
C:\ Job Processing System KrungThep - JPSOperatorConsole.cmd
qp AnsiMultiColor
30/05/06 21:10:35 IQ (Sys) AnsiMultiColor=0,1,2,3,4,5,6,7,8
run test01
30/05/06 21:10:39 I (Opr) run test01
30/05/06 21:10:39 I (Sys) About to run: JNM=test01,Type=0
30/05/06 21:10:39 I (Job) test01 JNM=test01,Date=2006/05/30,Time=21:10:39
30/05/06 21:10:39 I (Inp) test01 InputLine 5 Program=test01.rex found in recursive library=d:\jps1\JpsUserDirs\Applikasjoner\doctest"
30/05/06 21:10:39 I (Stp) test01 JNM=test01 JobStep,Date=2006/05/30,Time=21:10:39
30/05/06 21:10:39 I (Que) test01 Dynamic Rexx Queue 50000019c00001392744 created.
30/05/06 21:10:39 I (Rap) Run testQueue2 (test01,test01 JobStep)
30/05/06 21:10:39 I (Opr) Run testQueue2
30/05/06 21:10:39 I (Sys) About to run: JNM=testQueue2,Type=0
30/05/06 21:10:39 I (Job) testQueue2 JNM=testQueue2,Date=2006/05/30,Time=21:10:39
30/05/06 21:10:40 I (Inp) testQueue2 InputLine 5 Program=testQueue2.rex found in recursive library=d:\jps1\JpsUserDirs\Applikasjoner\doctest"
30/05/06 21:10:40 I (Stp) testQueue2 JNM=testQueue2 JobStep,Date=2006/05/30,Time=21:10:40
30/05/06 21:10:40 I (App) testQueue2 JpsSecretBetweenJobs = DillDall 50000019c00001392744
30/05/06 21:10:40 I (Que) testQueue2 2 Message(s) written to Rexx Queue 50000019c00001392744.
30/05/06 21:10:40 I (Que) test01 2 Message(s) read from Rexx Queue 50000019c00001392744.
30/05/06 21:10:40 I (App) test01 Melding nummer 1: DillDall Her kommer nok en melding til BUSKMANNEN!!!
30/05/06 21:10:40 W (App) test01 Melding nummer 2: Send you back to Texas make you work on your ranch!
30/05/06 21:10:40 I (Que) testQueue2 5 Message(s) written to Rexx Queue 50000019c00001392744.
30/05/06 21:10:40 I (Que) test01 5 Message(s) read from Rexx Queue 50000019c00001392744.
30/05/06 21:10:40 E (App) testQueue2 I HOPE THIS HELPS !!
30/05/06 21:10:40 W (App) test01 Melding nummer 1: 1 Send you back to Texas make you work on your ranch!
30/05/06 21:10:40 I (Eos) testQueue2 StepName=testQueue2 JobStep,Date=2006/05/30,Time=21:10:40,Duration=0.75,RC=0
30/05/06 21:10:40 I (Eoj) testQueue2 JNM=testQueue2,Date=2006/05/30,Time=21:10:40,Duration=0.813,RC=0
30/05/06 21:10:40 W (App) test01 Melding nummer 2: 2 Send you back to Texas make you work on your ranch!
30/05/06 21:10:40 W (App) test01 Melding nummer 3: 3 Send you back to Texas make you work on your ranch!
30/05/06 21:10:41 W (App) test01 Melding nummer 4: 4 Send you back to Texas make you work on your ranch!
30/05/06 21:10:41 I (App) test01 Melding nummer 5: DillDall ferdig
30/05/06 21:10:41 E (App) test01 HE HAS STILL NOT LEFT THE BUILDING !!
30/05/06 21:10:41 I (Que) test01 Rexx Queue 50000019c00001392744 deleted.
30/05/06 21:10:41 I (Eos) test01 StepName=test01 JobStep,Date=2006/05/30,Time=21:10:41,Duration=1.438,RC=0
30/05/06 21:10:41 I (Eoj) test01 JNM=test01,Date=2006/05/30,Time=21:10:41,Duration=1.531,RC=0
```

The Console & The Environment

```
C:\ Job Processing System KrungThep - JPSOperatorConsole.cmd
qp ansimulticolor
29/05/06 20:06:23 IQ (Sys) ansimulticolor=F,0,3,C,9,3,2,0,1
run testQ1
29/05/06 20:06:30 I (Opr) run testQ1
29/05/06 20:06:30 I (Sys) About to run: JNM=testQ1,Type=0
29/05/06 20:06:30 W (Sys) Try 2: Database already open. returned -20.
29/05/06 20:06:30 I (Job) testQ1 JNM=testQ1,Date=2006/05/29,Time=20:06:30
29/05/06 20:06:30 I (Inp) testQ1 InputLine 5 Program=testQ1.rex found in recursive library=d:\jps1\JpsUserDirs\Applikasjoner\doctest"
29/05/06 20:06:30 I (Stp) testQ1 JNM=testQ1 JobStep,Date=2006/05/29,Time=20:06:30
29/05/06 20:06:30 I (Que) testQ1 Dynamic Rexx Queue 50000019c00001378600 created.
29/05/06 20:06:30 I (Rap) Run testQueue2 (testQ1,testQ1 JobStep)
29/05/06 20:06:30 I (Opr) Run testQueue2
29/05/06 20:06:30 I (Sys) About to run: JNM=testQueue2,Type=0
29/05/06 20:06:31 I (Job) testQueue2 JNM=testQueue2,Date=2006/05/29,Time=20:06:31
29/05/06 20:06:31 I (Inp) testQueue2 InputLine 5 Program=testQueue2.rex found in recursive library=d:\jps1\JpsUserDirs\Applikasjoner\doctest"
29/05/06 20:06:31 I (Stp) testQueue2 JNM=testQueue2 JobStep,Date=2006/05/29,Time=20:06:31
29/05/06 20:06:31 I (App) testQueue2 JpsSecretBetweenJobs = DillDall 50000019c00001378600
29/05/06 20:06:31 I (Que) testQueue2 2 Message(s) written to Rexx Queue 50000019c00001378600.
29/05/06 20:06:31 I (Que) testQ1 2 Message(s) read from Rexx Queue 50000019c00001378600.
29/05/06 20:06:31 I (App) testQ1 Melding number 1: DillDall Her kommer nok en melding til BUSKMANNEN!!!
29/05/06 20:06:31 W (App) testQ1 Melding number 2: Send you back to Texas make you work on your ranch!
29/05/06 20:06:31 I (Que) testQueue2 5 Message(s) written to Rexx Queue 50000019c00001378600.
29/05/06 20:06:31 I (Que) testQ1 5 Message(s) read from Rexx Queue 50000019c00001378600.
29/05/06 20:06:31 E (App) testQueue2 I HOPE THIS HELPS !!
29/05/06 20:06:31 W (App) testQ1 Melding number 1: 1 Send you back to Texas make you work on your ranch!
29/05/06 20:06:31 I (Eos) testQueue2 StepName=testQueue2 JobStep,Date=2006/05/29,Time=20:06:31,Duration=0.75,RC=0
29/05/06 20:06:31 I (Eoj) testQueue2 JNM=testQueue2,Date=2006/05/29,Time=20:06:31,Duration=0.844,RC=0
29/05/06 20:06:31 W (App) testQ1 Melding number 2: 2 Send you back to Texas make you work on your ranch!
29/05/06 20:06:31 W (App) testQ1 Melding number 3: 3 Send you back to Texas make you work on your ranch!
29/05/06 20:06:32 W (App) testQ1 Melding number 4: 4 Send you back to Texas make you work on your ranch!
29/05/06 20:06:32 I (App) testQ1 Melding number 5: DillDall ferdig
29/05/06 20:06:32 E (App) testQ1 HE HAS STILL NOT LEFT THE BUILDING !!
29/05/06 20:06:32 I (Que) testQ1 Rexx Queue 50000019c00001378600 deleted.
29/05/06 20:06:32 I (Eos) testQ1 StepName=testQ1 JobStep,Date=2006/05/29,Time=20:06:32,Duration=1.438,RC=0
29/05/06 20:06:32 I (Eoj) testQ1 JNM=testQ1,Date=2006/05/29,Time=20:06:32,Duration=1.531,RC=0
```

The Console & The Environment

CTEXT.exe by Dennis Bareis

```
if AnsiMultiColorShell = 'Yes' then do
  .local['OUTPUT'] = .handleOutput~new(amc.)
  say date('E') time() 'I ' (Sys) Switching to ANSI Color Output'
end
```

```
::METHOD say
-- some code here
select
  when substr(word(line,3),1,1) = 'E' then do
    address CMD 'ctext.exe "{|| amc.3 ||}" || subword(line,1,2) ||,
    '{|| amc.4 ||}' || spaceHolder || subword(line,3) ||,
    '{|| amc.2 ||}'{\n}
  end
-- more code here
```

The Console & The Environment

Operator Commands

exit	Exits Core.rex
cls	Clears the screen
format schedule	Formats Main.Scedule
load schedule	Loads formatted schedule
q sched	Lists loaded schedule
run <i>jobname</i>	Starts job <i>jobname</i>
show <i>parameter</i>	Changes what is sent to STDOUT (<u>DEFAULT</u> ENOUGH ALL NO CLASSIC LOG ACCOUNT STEP)
qp <i>parametername</i>	Shows the value of <i>parametername</i>



Scheduling & Jobs

Scheduling & Jobs

The Main Schedule

```
*-----  
* This is a Main.Schedule  
*-----  
  
* Some jobs  
Run CSC HTN HTMC           Every Day      At 09:03  
Run CSC HTN Kvittring     Every Day      At 09:12  
Run OnceAMonth            On 8          At 10:00  
Run OnceInTheFuture       On 2014/10/20 At 19:00  
  
* Jobs to and from partner Preem  
Run XIProd Preem Ordre    Every Day At 07:17 08:17 09:17 10:17 11:17 12:17  
Run XIProd Preem Ordre    Every Day At 13:17 14:17 15:17 16:17 17:17 18:17 19:17  
  
/*  
Run Preem XIProd Faktura  Every Day At 10:07 19:07  
Run Preem HTN Transaksjoner Every MF At 17:40 08:40  
*/  
  
* Jobs to a Bank  
Run DNB HTN Telebank      Every Monday Wednesday Saturday At 19:00 21:03  
Run SAPEDB DNB Bankfiler  Every Day At 06:02 09:59 11:30 14:00 14:30 16:30 18:00  
  
* Jobs to other partners  
Run HTD HTN Transaksjoner Every MF      At 17:00 07:55  
Run HOS HTN Transaksjoner On           Fridays At 17:22 08:20
```

Scheduling & Jobs

Job Control Cards

```
//Job JNM="nameOfJob"  
  
//JobStep JNM="nameOfJobStep"  
//Account accountName="accountValue"  
//Libdef Search="UserJobDirectories from System.Table"  
//Parameters FileIn=" nameOfFile "  
//Exec PGM=" program,option "  
//Reader DLM=" endOfDataIndicator "  
  
//#  
//Conditional  
//EndConditional  
  
//EOJ
```

Scheduling & Jobs

Libdef and Path

Inherited Path from OS

```
D:\Perl\bin\;d:\bin;d:\mysql\bin;C:\WINDOWS\system32;C:\WINDOWS;  
C:\WINDOWS\System32\Wbem;  
d:\Program Files\IDM Computer Solutions\UltraEdit-32;  
D:\Program Files\ObjREXX;D:\Program Files\ObjREXX\OODIALOG
```

System.Table

```
F2BDirectorySystem      "d:\jps1\System\  
F2BDirectoryUtilities  "d:\jps1\Utilities\  
  
UserJobDirectory       "Dir.Applikasjoner = d:\jps1\JpsUserDirs\Applikasjoner\  
UserJobDirectory       "Dir.ProdPrograms = d:\jps1\JpsUserDirs\ProdPrograms\  
UserJobDirectory       "Dir.ProdParams = d:\jps1\JpsUserDirs\ProdParameters\  
  
UserDefaultLibdef      "Dir.Applikasjoner"
```

Scheduling & Jobs

Libdef and Path

Job found here

```
d:\jps1\JpsUserDirs\Applikasjoner\diIldall\
```

From Job's JCL

```
//Libdef      Search="Dir.ProdPrograms Dir.ProdParams"  
//Exec       PGM="startEnJobb.rex,PARAM"
```

System.Table

```
F2BDirectorySystem  "d:\jps1\System\  
F2BDirectoryUtilities "d:\jps1\Utilities\  
  
UserJobDirectory    "Dir.Applikasjoner = d:\jps1\JpsUserDirs\Applikasjoner\  
UserJobDirectory    "Dir.ProdPrograms = d:\jps1\JpsUserDirs\ProdPrograms\  
UserJobDirectory    "Dir.ProdParams = d:\jps1\JpsUserDirs\ProdParameters\  
  
UserDefaultLibdef   "Dir.Applikasjoner"
```

Scheduling & Jobs

Libdef and Path

Resulting Path

```
d:\jps1\JpsUserDirs\Applikasjoner\dilldall\;  
d:\jps1\JpsUserDirs\ProdPrograms\;  
d:\jps1\JpsUserDirs\ProdParameters\;  
d:\jps1\System\;  
d:\jps1\Utilities\;  
D:\Perl\bin\;d:\bin;d:\mysql\bin;C:\WINDOWS\system32;C:\WINDOWS;  
C:\WINDOWS\System32\Wbem;  
d:\Program Files\IDM Computer Solutions\UltraEdit-32;  
D:\Program Files\ObjREXX;D:\Program Files\ObjREXX\OODIALOG
```

Scheduling & Jobs

//Exec

JobRun class

5 Methods

StartJobARG

StartJobREXXARG

StartJobMSG

StartJobPARAM

CheckJobFinished

```
::method StartJobARG unguarded
expose JobFinished
use arg routine,FrontPath,DefaultPath
JobFinished = ""
reply ""
dummy = time('R')

address CMD 'SET PATH='FrontPath'%PATH%'
address CMD routine

LASTRC = rc
jobduration = strip(time('R'),'T','0')
if jobduration = "" then jobduration = "0.00"
JobFinished = jobduration','LASTRC
return
```

```
::method CheckJobFinished
expose JobFinished
return JobFinished
```

Scheduling & Jobs

//Exec

JobRun class

5 Methods

StartJobARG

StartJobREXXARG

StartJobMSG

StartJobPARAM

CheckJobFinished

StartJobArg

```
//JobStep JNM="Write arguments"  
//Exec PGM="test.pl"  
"d:\log\logfile OK.txt"  
"d:\log\logfile ERR.txt"  
//#
```

```
test.pl "d:\log\logfile OK.txt" "d:\log\logfile ERR.txt"
```

```
print "argument0: $ARGV[0]\n";  
print "argument1: $ARGV[1]\n";  
exit 0;
```

Scheduling & Jobs

//Exec

JobRun class

5 Methods

StartJobARG

StartJobREXXARG

StartJobMSG

StartJobPARAM

CheckJobFinished

```
::method StartJobPARAM unguarded
expose JobFinished
use arg routine,FrontPath,DefaultPath,Semaphore,,,
        Messages.,wsyspar.,wusrpar.,Qmessages.,,
        parameterContainer
JobFinished = ""
reply ""
dummy = time('R')

address CMD 'SET PATH='FrontPath'%PATH%'
interpret routine

jobduration = strip(time('R'),'T','0')
if jobduration = "" then jobduration = "0.00"
JobFinished = jobduration','LASTRC
return
```


Scheduling & Jobs

//Exec

JobRun class

5 Methods

StartJobARG

StartJobREXXARG

StartJobMSG

StartJobPARAM

CheckJobFinished

StartJobPARAM

```
//JobStep JNM="Write arguments"
```

```
//Exec PGM="test.rex,PARAM"
```

```
OKFile "d:\log\logfile OK.txt"
```

```
ErrFile "d:\log\logfile ERR.txt"
```

```
//#
```

```
LASTRC = test(Semaphore.,Messages.,,  
wsyspar.,wusrpar.,,  
Qmessages.,,  
parameterContainer)
```

Scheduling & Jobs

//Exec

JobRun class

5 Methods

StartJobARG

StartJobREXXARG

StartJobMSG

StartJobPARAM

CheckJobFinished

StartJobPARAM

```
use arg arg1., arg2., arg3., arg4., arg5., arg6
```

```
do i = 1 to arg4.0
```

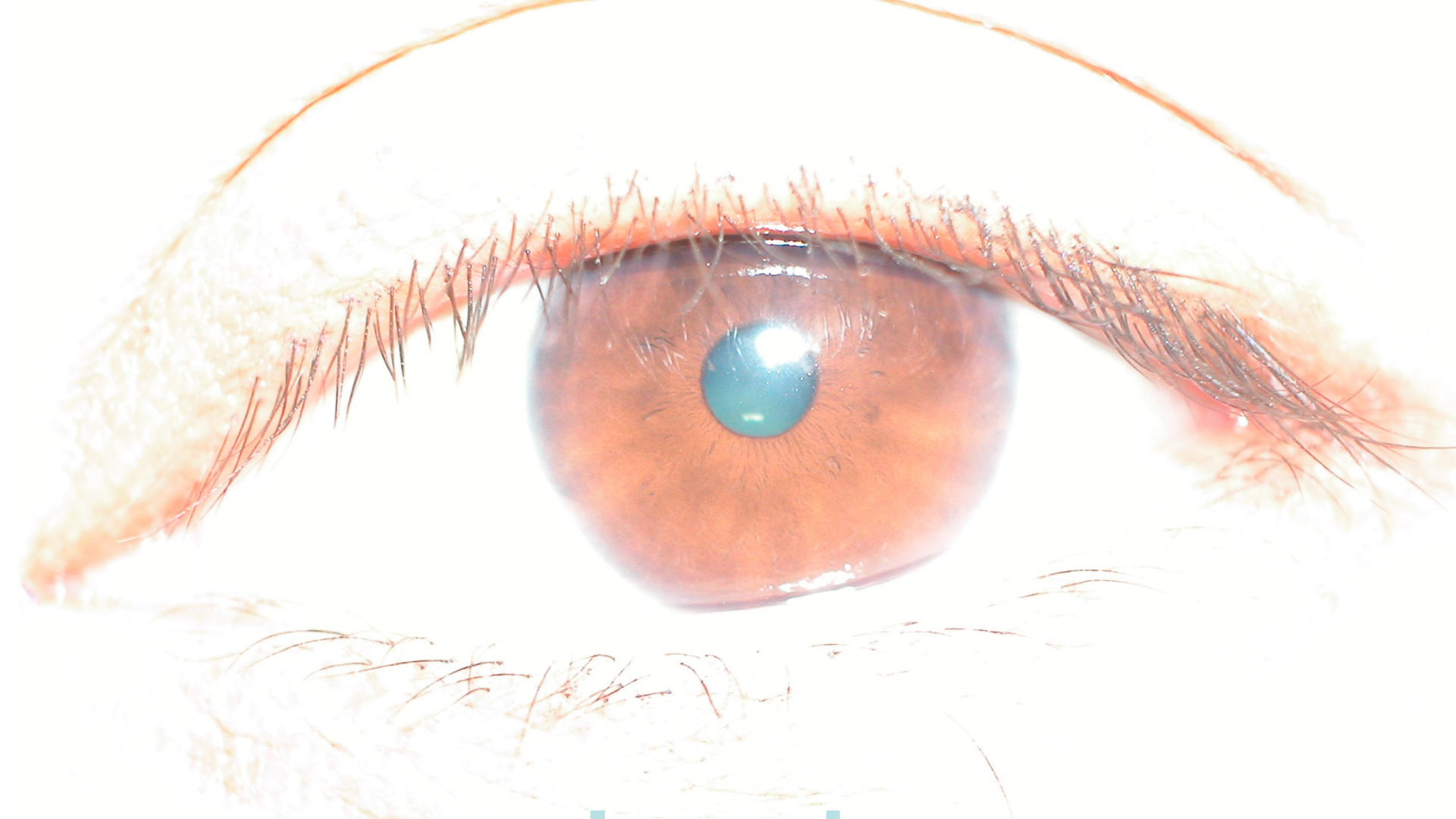
```
  interpret arg4.i
```

```
end
```

```
dummy = sendmessage('I',arg1.,arg2., ||,  
                    'OK file is:' OKFile)
```

```
dummy = sendmessage('I',arg1.,arg2., ||,  
                    'ERR file is:' ErrFile)
```

```
return "0,Some message"
```



Logging Accounting

Logging & Accounting

Command Prompt (3) - mysql -uroot -p

```
mysql> select JNm,JsNm,FromAdr,ToAdr,Msg,Stat,LogText from log;
```

JNm	JsNm	FromAdr	ToAdr	Msg	Stat	LogText
enJobb	\$JobControl	\$Internal	\$Internal	I	Job	JNm="enJobb",Date=2006/05/22,Time=19:00:06
enJobb	\$JobControl	\$Internal	\$Internal	I	Inp	InputLine 13 Program="startEnJobb.rex" found in recursive library="d:\jps1\jpsUserDirs
enJobb	\$JobControl	\$Internal	\$Internal	I	Inp	InputLine 24 Program="test.rex" not found in Libdef. Assuming PATH
enJobb	etStep	enAccount	enTredjeAccount	I	Stp	JNm="etStep",Date=2006/05/22,Time=19:00:07
enJobb	etStep	enAccount	enTredjeAccount	I	App	Her kommer litt informasjon
enJobb	etStep	enAccount	enTredjeAccount	E	App	Her kommer en advarsel
enJobb	etStep	enAccount	enTredjeAccount	E	App	Her rapporteres en feil
enJobb	etStep	enAccount	enTredjeAccount	I	Rap	dummy#73245219:00:07.7340002636
enJobb	etStep	enAccount	enTredjeAccount	I	Con	StepName="etStep",Date=2006/05/22,Time=19:00:07,Send en melding til core.rex
enJobb	etStep	enAccount	enTredjeAccount	I	Eos	StepName="etStep",Date=2006/05/22,Time=19:00:07,Duration=0.234,RC=0
dummy	\$JobControl	\$Internal	\$Internal	I	Job	JNm="dummy",Date=2006/05/22,Time=19:00:07
dummy	\$JobControl	\$Internal	\$Internal	I	Inp	InputLine 7 Program="Return2.rex" found in recursive library="d:\jps1\jpsUserDirs\Prod
dummy	do nothing	dummy	dummy	I	Stp	JNm="do nothing",Date=2006/05/22,Time=19:00:08
dummy	do nothing	dummy	dummy	I	Eos	StepName="do nothing",Date=2006/05/22,Time=19:00:08,Duration=0.00,RC=0
dummy	\$JobControl	\$Internal	\$Internal	I	EOJ	JNm="dummy",Date=2006/05/22,Time=19:00:08,Duration=0.563,RC=0
enJobb	nok Et Step	enAccount	enAnnenAccount	I	Stp	JNm="nok Et Step",Date=2006/05/22,Time=19:00:09
enJobb	nok Et Step	enAccount	enAnnenAccount	I	App	Her kommer en melding fra programmet.
enJobb	nok Et Step	enAccount	enAnnenAccount	I	Eos	StepName="nok Et Step",Date=2006/05/22,Time=19:00:09,Duration=0.00,RC=0
enJobb	\$JobControl	\$Internal	\$Internal	I	EOJ	JNm="enJobb",Date=2006/05/22,Time=19:00:09,Duration=2.734,RC=0

19 rows in set (0.00 sec)

```
mysql>
```

Logging & Accounting

Command Prompt (3) - mysql -uroot -p

```
mysql> select JNm,JsNm,AccNm,AccVal from account;
```

JNm	JsNm	AccNm	AccVal
enJobb	\$JobControl	StartTime	20060522190006
enJobb	\$JobControl	JobEntryStatus	009b F 2 R 1
enJobb	\$JobControl	JobPath	d:\jps1\JpsUserDirs\ProdJCL\enJobb.job
enJobb	etStep	Program	startEnJobb.rex
enJobb	etStep	StepStartTime	20060522190007
enJobb	etStep	FromAdr	enAccount
enJobb	etStep	ToAdr	enTredjeAccount
enJobb	etStep	Eier	Donald Duck
enJobb	etStep	Oppdragsgiver	MikkeMus
enJobb	etStep	Dolly.Deluxe.Duck	Andeby BackYardBird
enJobb	etStep	StepRC	0
enJobb	etStep	StepEndTime	20060522190007
enJobb	etStep	StepDuration	0.234
dummy	\$JobControl	StartTime	20060522190007
dummy	\$JobControl	JobEntryStatus	009b F 2 R 1
dummy	\$JobControl	JobPath	d:\jps1\JpsUserDirs\ProdJCL\dummy.job
dummy	do nothing	Program	Return2.rex
dummy	do nothing	StepStartTime	20060522190008
dummy	do nothing	FromAdr	dummy
dummy	do nothing	ToAdr	dummy
dummy	do nothing	StepRC	0
dummy	do nothing	StepEndTime	20060522190008
dummy	do nothing	StepDuration	0.00
dummy	\$JobControl	RC	0
dummy	\$JobControl	EndTime	20060522190008
dummy	\$JobControl	Duration	0.563
enJobb	nok Et Step	Program	test.rex
enJobb	nok Et Step	StepStartTime	20060522190009
enJobb	nok Et Step	FromAdr	enAccount
enJobb	nok Et Step	ToAdr	enAnnenAccount
enJobb	nok Et Step	StepRC	0
enJobb	nok Et Step	StepEndTime	20060522190009
enJobb	nok Et Step	StepDuration	0.00
enJobb	\$JobControl	RC	0
enJobb	\$JobControl	EndTime	20060522190009
enJobb	\$JobControl	Duration	2.734

36 rows in set (0.00 sec)

```
mysql>
```

Annotations: 1 points to the command prompt window title, 2 points to the 'enJobb' job name, 3 points to the 'Andeby BackYardBird' value, 4 points to the 'Return2.rex' program name, 5 points to the '0.563' duration value, 6 points to the '2.734' duration value.

Logging & Accounting

NodeName: ▾

Reverse: Forward:

Date from: to:

Lines: Start:

Show: Start of job Jobstep Message Application End of step End of job

Error: Information Warnings Errors Unknown

[Prev](#) | [Next](#)

Date	Time	Node	Msg	Stat	Text
20070424	12:10:00	KrungThep	I	Job	JNM="BBS SAPEDB Kunde",Date=2007/04/24,Time=12:10:00
20070424	12:00:04	KrungThep	I	EOJ	JNM="HTD HTN Pinoff",Date=2007/04/24,Time=12:00:04,Duration=4.
20070424	12:00:00	KrungThep	I	Job	JNM="HTD HTN Pinoff",Date=2007/04/24,Time=12:00:00
20070424	11:39:10	KrungThep	I	EOJ	JNM="BBS SAPEDB Kunde",Date=2007/04/24,Time=11:39:10,Duration=
20070424	11:38:58	KrungThep	I	Job	JNM="BBS SAPEDB Kunde",Date=2007/04/24,Time=11:38:58
20070424	11:31:07	KrungThep	I	EOJ	JNM="HTN Ergo Sperringer Norge Dag",Date=2007/04/24,Time=11:31
20070424	11:31:01	KrungThep	I	EOJ	JNM="SAPEDB DNB Bankfiler",Date=2007/04/24,Time=11:31:01,Durat
20070424	11:31:00	KrungThep	I	Job	JNM="SAPEDB DNB Bankfiler",Date=2007/04/24,Time=11:31:00
20070424	11:30:05	KrungThep	I	EOJ	JNM="HTN Ergo Submit Sperringer Dag",Date=2007/04/24,Time=11:3

Logging & Accounting

```

20070423 09:33:00 KrungThep I Job JNM="Repliker AS400",Date=2007/04/23,Time=09:33:00
20070423 09:30:01 KrungThep I EOJ JNM="HTN Computerland Ufakturert",Date=2007/04/23,Time=09:30:01,Duration=1.422,RC=0
20070423 09:30:00 KrungThep I Job JNM="HTN Computerland Ufakturert",Date=2007/04/23,Time=09:30:00
20070423 09:25:01 KrungThep I EOJ JNM="HTN Computerland Kunde",Date=2007/04/23,Time=09:25:01,Duration=1.297,RC=0
20070423 09:25:00 KrungThep I Job JNM="HTN Computerland Kunde",Date=2007/04/23,Time=09:25:00
20070423 09:20:01 KrungThep I EOJ JNM="HTN Computerland Kort",Date=2007/04/23,Time=09:20:01,Duration=1.453,RC=0
20070423 09:20:00 KrungThep I Job JNM="HTN Computerland Kort",Date=2007/04/23,Time=09:20:00
20070423 09:18:03 KrungThep I EOJ JNM="DHL SAPEDB Fraktbrev",Date=2007/04/23,Time=09:18:03,Duration=3.485,RC=0
20070423 09:18:00 KrungThep I Job JNM="DHL SAPEDB Fraktbrev",Date=2007/04/23,Time=09:18:00
20070423 09:17:16 KrungThep I EOJ JNM="XIProd Preem Ordre",Date=2007/04/23,Time=09:17:16,Duration=16.109,RC=0
20070423 09:17:00 KrungThep I Job JNM="XIProd Preem Ordre",Date=2007/04/23,Time=09:17:00
20070423 09:15:38 KrungThep I EOJ JNM="HTN Computerland Fakturert",Date=2007/04/23,Time=09:15:38,Duration=38.062,RC=0
20070423 09:15:00 KrungThep I Job JNM="HTN Computerland Fakturert",Date=2007/04/23,Time=09:15:00
20070423 09:12:05 KrungThep E EOJ JNM="CSC HTN Kvittering",Date=2007/04/23,Time=09:12:05,Duration=5.015,RC=1
20070423 09:12:00 KrungThep I Job JNM="CSC HTN Kvittering",Date=2007/04/23,Time=09:12:00
20070423 09:03:14 KrungThep I EOJ JNM="CSC HTN HTMC",Date=2007/04/23,Time=09:03:14,Duration=14.562,RC=0
20070423 09:03:00 KrungThep I Job JNM="CSC HTN HTMC",Date=2007/04/23,Time=09:03:00
20070423 08:45:31 KrungThep I EOJ JNM="BBS HTN Bankkort",Date=2007/04/23,Time=08:45:31,Duration=2730.828,RC=0
20070423 08:40:08 KrungThep I EOJ JNM="Preem HTN Transaksjoner",Date=2007/04/23,Time=08:40:08,Duration=8.047,RC=0
20070423 08:40:00 KrungThep I Job JNM="Preem HTN Transaksjoner",Date=2007/04/23,Time=08:40:00
20070423 08:20:02 KrungThep I EOJ JNM="HOS HTN Transaksjoner",Date=2007/04/23,Time=08:20:02,Duration=1.859,RC=0
20070423 08:20:00 KrungThep I Job JNM="HOS HTN Transaksjoner",Date=2007/04/23,Time=08:20:00
20070423 08:17:01 KrungThep I EOJ JNM="XIProd Preem Ordre",Date=2007/04/23,Time=08:17:01,Duration=0.625,RC=0

```

[Back](#)

Date	Time	Node	From	To	Msg	Stat	Text
20070423	09:12:00	KrungThep	\$Internal	\$Internal	I	Job	JNM="CSC HTN Kvittering",Date=2007/04/23,Time=09:12:00
20070423	09:12:01	KrungThep	\$Internal	\$Internal	I	Inp	InputLine 9 Program="FTPDelivery.rex" not found in Libdef. Assum:
20070423	09:12:01	KrungThep	CSC	HTNAS400	I	Stp	JNM="Hent Kvittering",Date=2007/04/23,Time=09:12:01
20070423	09:12:05	KrungThep	CSC	HTNAS400	E	App	Ftp Error (FtpLs). Rc=-1 ,FTPERRNO=FTPCOMMAND FromFtp= 147.29.11.
20070423	09:12:05	KrungThep	CSC	HTNAS400	E	Eos	StepName="Hent Kvittering",Date=2007/04/23,Time=09:12:05,Duration:
20070423	09:12:05	KrungThep	\$Internal	\$Internal	E	EOJ	JNM="CSC HTN Kvittering",Date=2007/04/23,Time=09:12:05,Duration=!

Case Studies



Case Studies

return.rex - IEFBR14

```
//JobStep JNM="Prepare Mail"  
//Exec PGM="return.rex"  
//#  
  
//Conditional  
"echo 'Subject: BACKUP' > backupmail.txt"  
"echo '' >> backupmail.txt"  
"echo '' >> backupmail.txt"  
'echo "Old Files To Be Deleted:" >> backupmail.txt'  
'echo "" >> backupmail.txt'  
'ls -lAh ./files | cat >> backupmail.txt'  
//EndConditional
```

Case Studies

return.rex - IEFBR14

```
//JobStep JNM="Backup Data"  
//Exec PGM="backup.exe"  
//#  
  
//Conditional  
  if LASTRC \= 0 then NextStep = 'EndOfJob'  
//EndConditional  
  
//JobStep JNM="Update Data"  
//Exec PGM="update.exe"  
//#  
  
//Conditional  
  if LASTRC = 0 then NextStep = 'EndOfJob'  
//EndConditional  
  
//JobStep JNM="Restore Data"  
//Exec PGM="restore.exe"  
//#  
  
//JobStep JNM="EndOfJob"  
//Exec PGM="return.rex"  
//#  
//EOJ
```

Case Studies

runcmdmulti.rex

```
//JobStep      JNM="Copy and zip files"  
//Exec        PGM="runcmdmulti.rex,PARAM"  
  
cmdstring.0    9  
  
cmdstring.1    'rd /S/Q d:\backup'  
cmdstring.1.1  'SetShellRcZero'  
  
cmdstring.2    'xcopy d:\jps1\jpsCert d:\backup\jpsCert /EI'  
cmdstring.3    'xcopy d:\jps1\JpsUserDirs d:\backup\jps1\JpsUserDirs /EI'  
cmdstring.4    'xcopy d:\jps1\System d:\backup\jps1\System /EI'  
cmdstring.5    'xcopy d:\jps1\Utilities d:\backup\jps1\Utilities /EI'  
cmdstring.6    'xcopy d:\JPS_ApplMasterFiles d:\backup\JPS_ApplMasterFiles /EI'  
cmdstring.7    'xcopy d:\gpg d:\backup\gpg /EI'  
cmdstring.8    'xcopy d:\htadm d:\backup\htadm /EI'  
  
cmdstring.9    'd:\infozip\zip\zip -rq d:\backup\jps.0.backup.zip d:\backup'  
cmdstring.9.1  'TimeTranslate'  
//#
```

Case Studies

python wrapper example

```
//JobStep JNM="Dump R01 Config"  
//Exec PGM="telnetcisco.rex,PARAM"  
IPAddress "10.12.22.3"  
OutFile "D:\backup\R01_Dump_@$.txt"  
CiscoCert "cisco_R01"  
CiscoEnaCert "cisco_R01_ena"  
Command1 "terminal length 0"  
Command2 "sh run"  
Command3 "exit"  
ErrorIfFound "% Bad secrets"  
//#
```

```
'telnetcisco.py "'IPAddress'" "'OutFile'"',  
'"'CiscoPSW'" "'CiscoEnaPSW'"',  
'"'Command1'" "'Command2'"',  
'"'Command3'"'
```

```
import sys  
import telnetlib  
HOST = sys.argv[1]  
PASS1 = sys.argv[3]  
PASS2 = sys.argv[4]  
tn = telnetlib.Telnet(HOST)  
tn.read_until("Password: ")  
tn.write(PASS1 + "\n")  
tn.read_until(">")  
tn.write("en\n")  
tn.read_until("Password: ")  
tn.write(PASS2 + "\n")  
tn.write("terminal length 0\n")  
  
tn.write(sys.argv[5] + "\n")  
tn.write(sys.argv[6] + "\n")  
tn.write(sys.argv[7] + "\n")  
tn.write("exit\n")  
  
sys.stdout = open(sys.argv[2], 'w')  
print tn.read_all()
```

Case Studies

FTPDeliv

```
//JobStep JN
//Account Fr
//Parameters
//Parameters
//Parameters
//Exec PGM="
TransitWorkA
ArchiveDirec
FromDirector
ToDirectory
FromFtpFiles
FromFileSele
PGPCryptTo "
ToNameTempMa
//#
```

```
FromActiveFtpFlag      "A"
ToActiveFtpFlag        "A"
FromMode                'ASCII'
ToMode                  "ASCII"

FromFtpDirFlag          "Y"
FromFtpDirWordPos      "9"
FromFtpFileSelect      ""
FromFileSelect          "FSO- log.- -.ftp .- ..-"
FromFileIgnoreCase     "Y"

ToNameMask              "<1-*>"
ToNameTempMask         "<1-*>.Temp"
```

```
FTP                    'nrwlx01.hydrotexaco.no'
Userid                 'eb'
Cert                   'FTP_NRWLX01_EB'
Directory              ''
```

```
PGPRingPrivate         "d:\gpg\fso\keys.sec"
GnuPGPath              "d:\gpg\fso\bin\gpg.exe"
GnuPGMyKey             "MyCompanyName"
GnuPGAction            "decrypt"
```

Case Studies

delete old files

```
//JobStep JNM="Delete Files"  
//Exec   PGM="DeleteOldFiles.rex,PARAM"  
  
Directories      5  
  
Directory.1      "d:\FTPDeliveryArchive\kp"  
Retention.1      -1  
Directory.2      "d:\ftp.filetrans\htxfer"  
Retention.2      15  
Directory.3      "d:\ftp.filetrans\itella"  
Retention.3      60  
Directory.4      "d:\FTPDeliveryArchive"  
Retention.4      31  
Directory.5      "D:\backup\FSOServer*"  
Retention.5      7  
//#
```

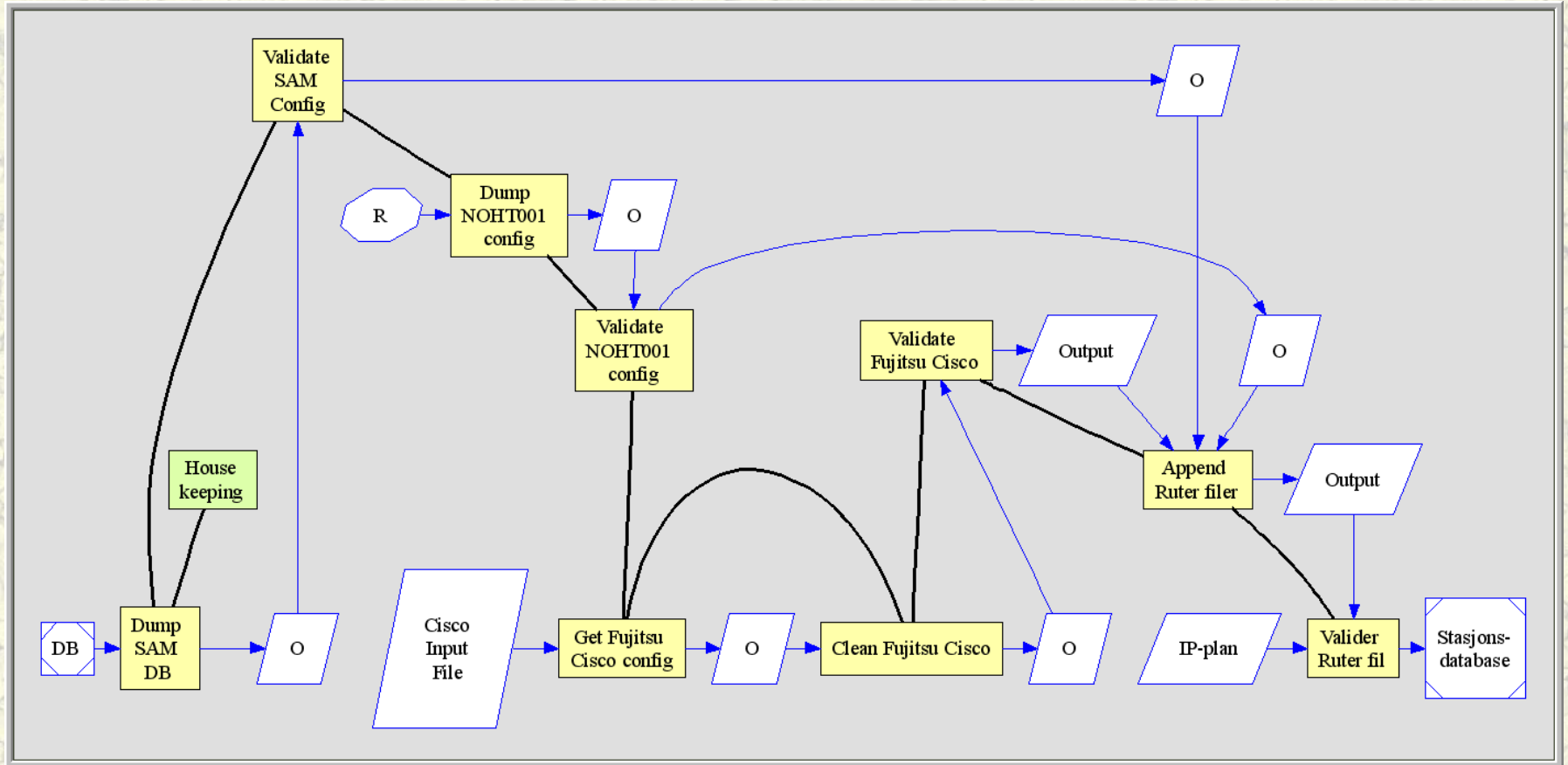
Case Studies

grab a mutex

```
// JobStep JNM="Grab Mutex"  
// Exec    PGM="GRABMUTEX.rex, PARAM"  
  
mutexWait      "3000"  
mutexSleep     "0.1"  
mutexRetries   "36000"  
mutexName      "ergofiles"  
  
// #
```

Case Studies

Jobsteam example



Case Studies

IBM Object REXX Interpreter Version 2.1.3

2 dedicated 2003 servers, one active, one standby
Servers synchronized by JPS jobs running Rsync

In production	: 6 years
Jobs - Unique	: 100
Jobs run daily	: 135
JobSteps daily	: 2400
Files daily	: 3200
Logging daily	: 50000
Monthly total logging	: 1.5 million records
Files monthly	: close to 100,000



Thanks to:



From **MorgueFile**
happylyns



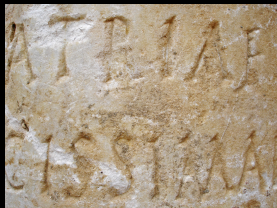
From **MorgueFile**
keyseeker



From **Stock.xchng**
josecarli



From **MorgueFile**
kittenpuff1



From **Stock.xchng**
ortonesque



Courtesy **Garr Reynolds**
Presentation Zen



From **MorgueFile**
clarita




From **MorgueFile**
dantada



From **MorgueFile**
abpphotos



From **MorgueFile**
Ladyheart



QUARTZ
Q&A

