

2004

UI

(Korean Belle Data Grid -

)

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)

論文 碩士學位 論文 提出

2004 年 6 月

梨花女子大學校 情報科學大學院

專攻

權 五 蓮

論文

碩士學位 論文

認准

指導教授 _____

審查委員 _____

梨花女子大學校 情報科學大學院

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가 . ,

,

. ,

100GFLOPS

가

.

가

.

.

(Grid)

,

.

,

,

,

, 가

.

,

,

.

User

Interface

.

,

가

HTML, PHP

PHP Shell script

CE, SE,

Worker Node

가

1.

1.1.

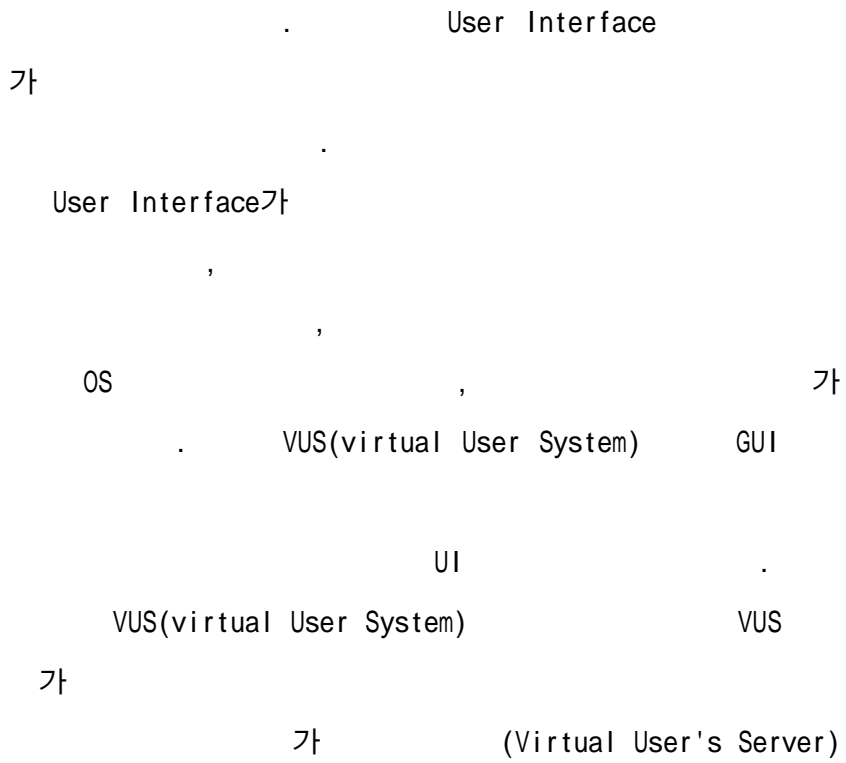
(WWW)

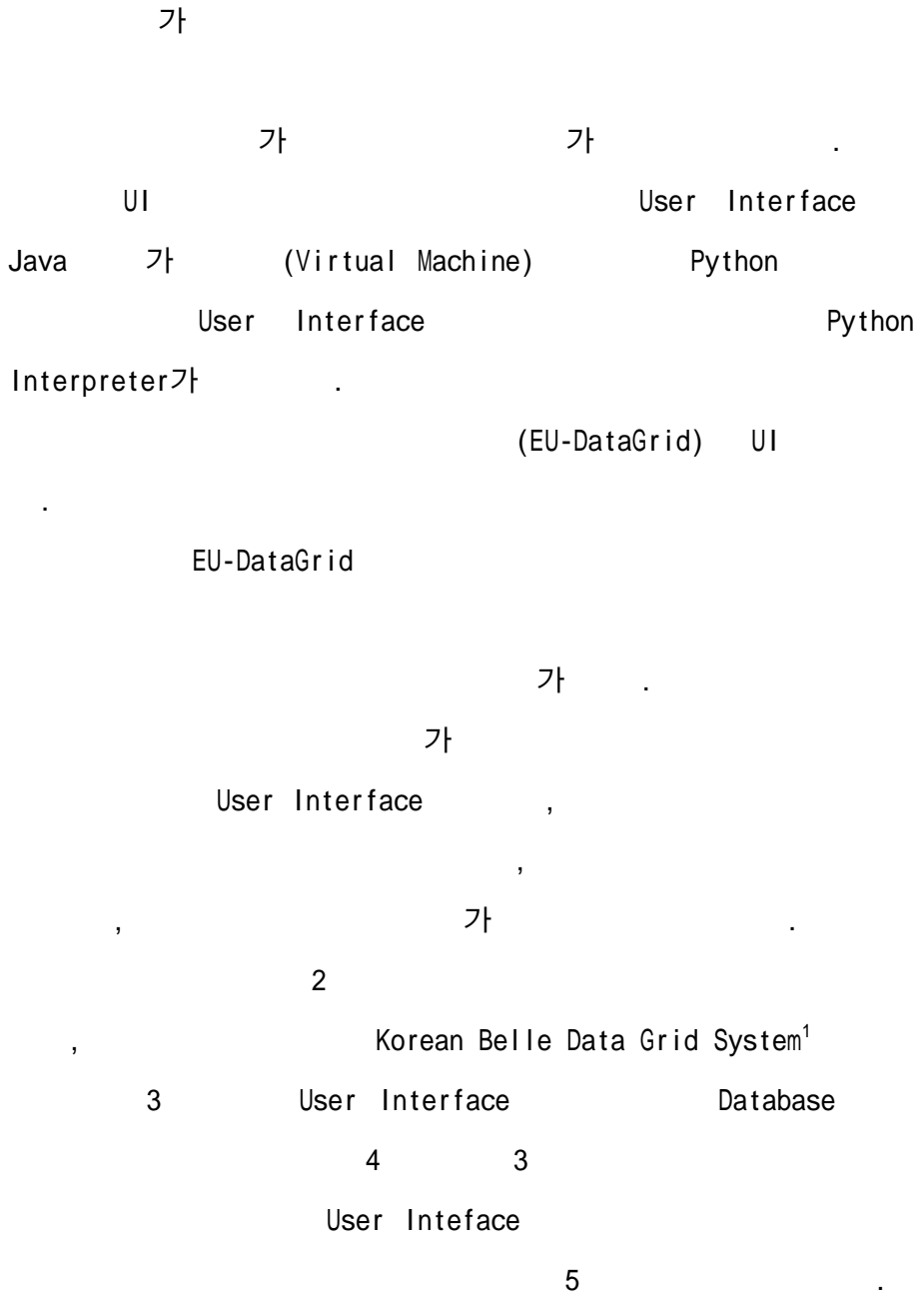
www

가

1.2.

User Interface



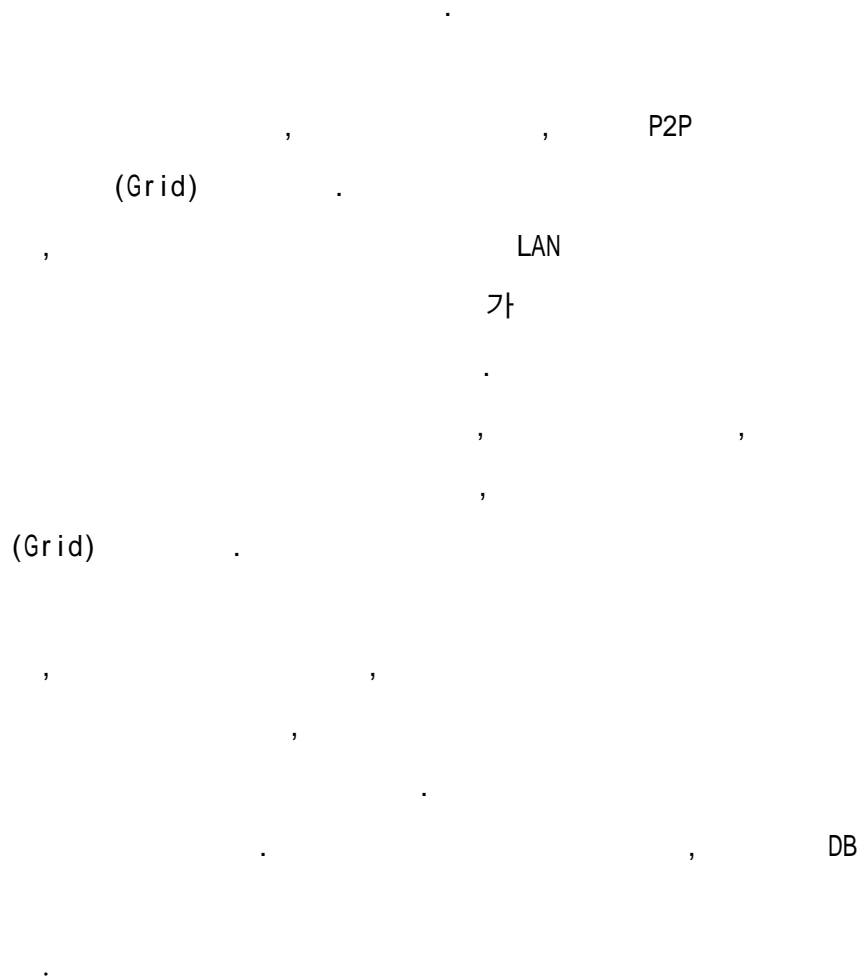


¹ 가 Belle Project group 2002

2.

2.1.

2.1.1. Grid



(Computational) , (Access)

Peta Byte

(IT)

(WWW)

가

가

가

, 가

가

가

2.1.2. Grid

가 . 가 5

가 .
가 Grid ,
KOREN . KOREN Grid
가

- .
- / Grid
- Globus
- Globus

- Grid Collaboration Site

GFK(Grid Forum Korea) [www.gridforumkorea.org]

. KOREN, KREONET2, APII

, TEIN ISP
GRID

2.1.3. Grid

가. : SETI@Home, HGP, NASA IPG

(www.gridforum.org) ANL NASA

가

,

APGrid가 가

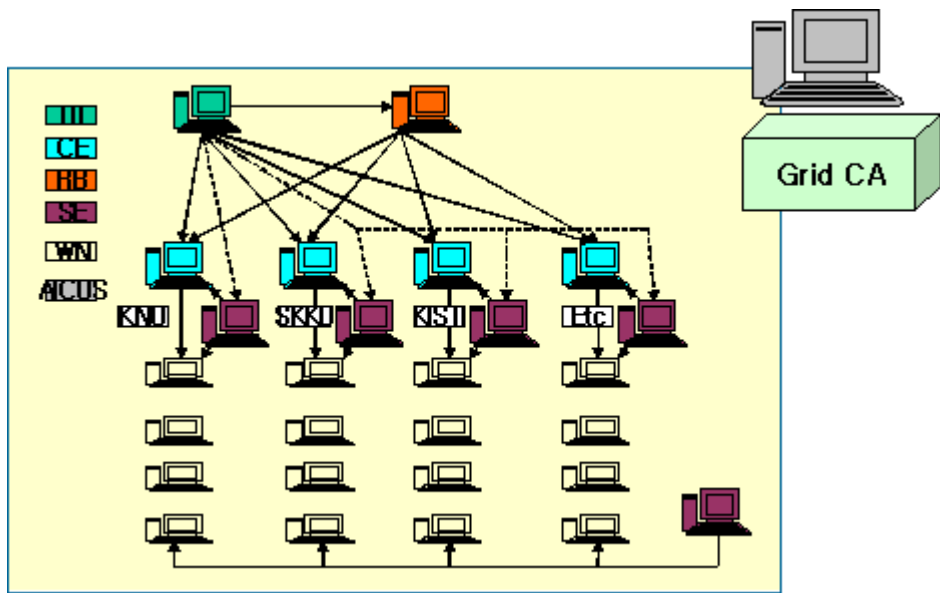
. : Abiliene, vNBS, ISP, NREN
 . : European Data GRID, Euro GRID
 (www.egrid.org)
 CERN
 TACC
 , , ,
 ..
 : TEN-155
 . : APGrid
 APGrid APAN Globus
 , ,
 ..
 : SINET/IMNET
 . Grid

	Globus	http://www.globus.org
	Legion	http://www.legion.virginia.edu
	Apples	http://www.infospheres.caltech.edu
	NerSolve	http://icl.cs.utk.edu/netsolve/
	NASA IPG	http://www.ipg.nasa.org
	Condor	http://www.cs.wise.edu/condor
	JAMELIN	http://www.cs.ucsb.edu/research/
	Ninf	http://ninf.etl.go.jp
	Bricks	http://matsu-

(NT) (BT), (ET), (IT),
 가
 4가 (4As)
 (Advanced Network)',
 (Advanced Computer)',
 (Advanced Application)' (Advanced User)'

가 50
 (CPU) 40~80%
 CPU 70~95%
 100 ~300
 3

2.3. Korean Belle Data Grid System



1 Korean Belle Data Grid

2.3.1.

(computing)

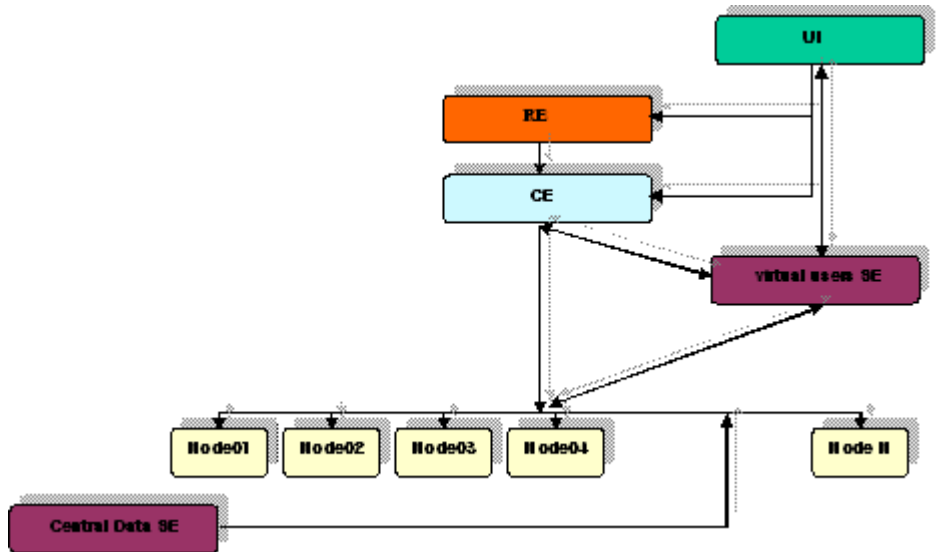
(Grid) . Korean Belle Data Grid
 System (cluster)
 (Monte Carlo)
 (Simulation) , Belle
 Belle
 (Computing farm)

2.3.2. Korean Belle Data Grid System

Clusters globus2.0
 EU Data Grid testbed²가 . EU Data Grid
 group globus analysis
 system . EU Data Grid testbed
 ,
 EU Data Grid testbed
 , Korea HEP Data
 Grid globus toolkit , EU Data Grid
 testbed globus toolkit(globus 2.4)
 .
 EU Data Grid testbed EU Data Grid Testbed
 Grid application 가
 .
 2002 globus tool kit(globus2.4)
 Cluster
 Belle 가 ,
 Grid Grid

²
 CERN EU-DataGrid

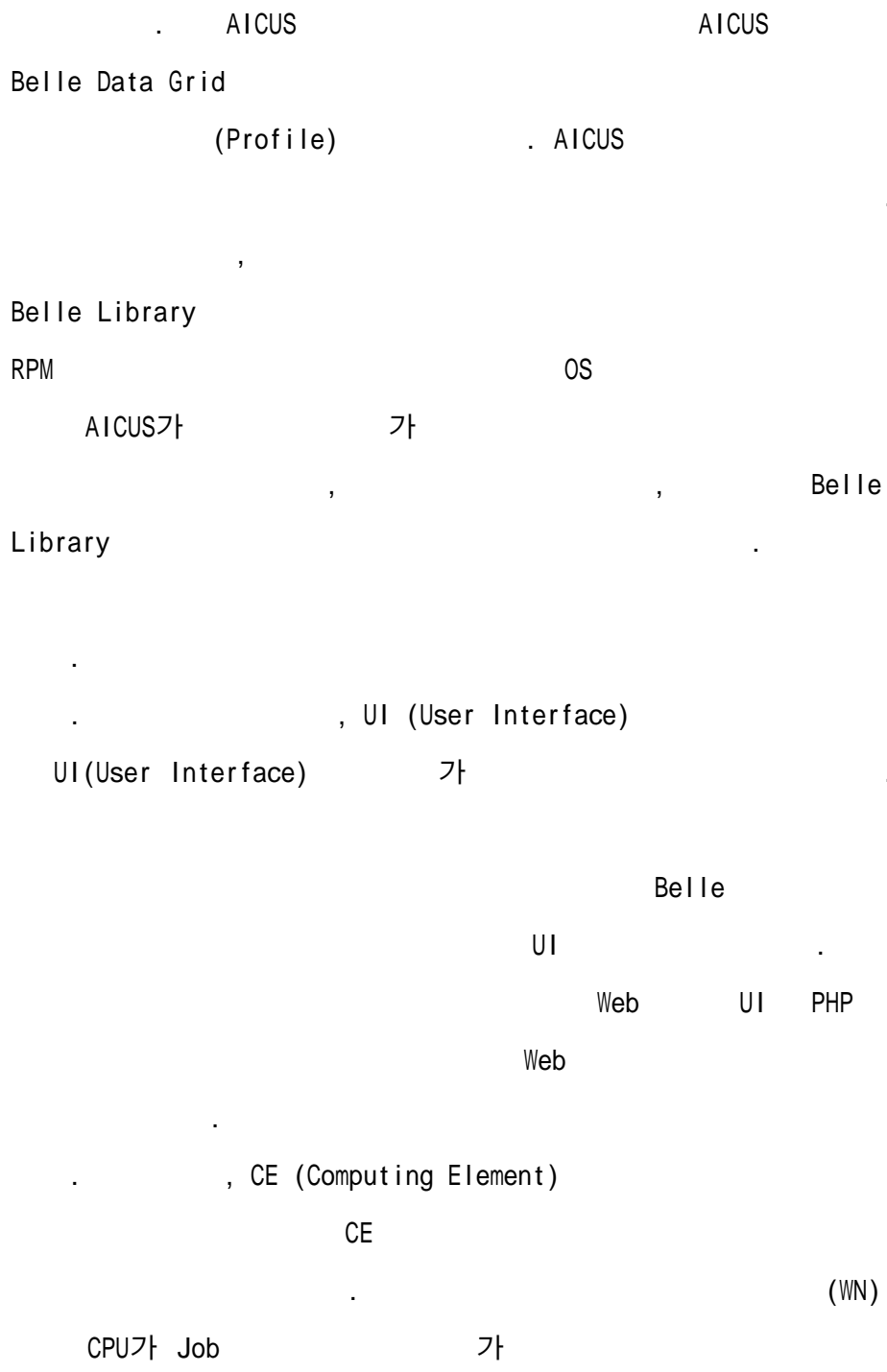
HEP Data Grid
 EUDG , Belle globus2.4
 가 .
 Grid OS globus tool kit 가
 Belle

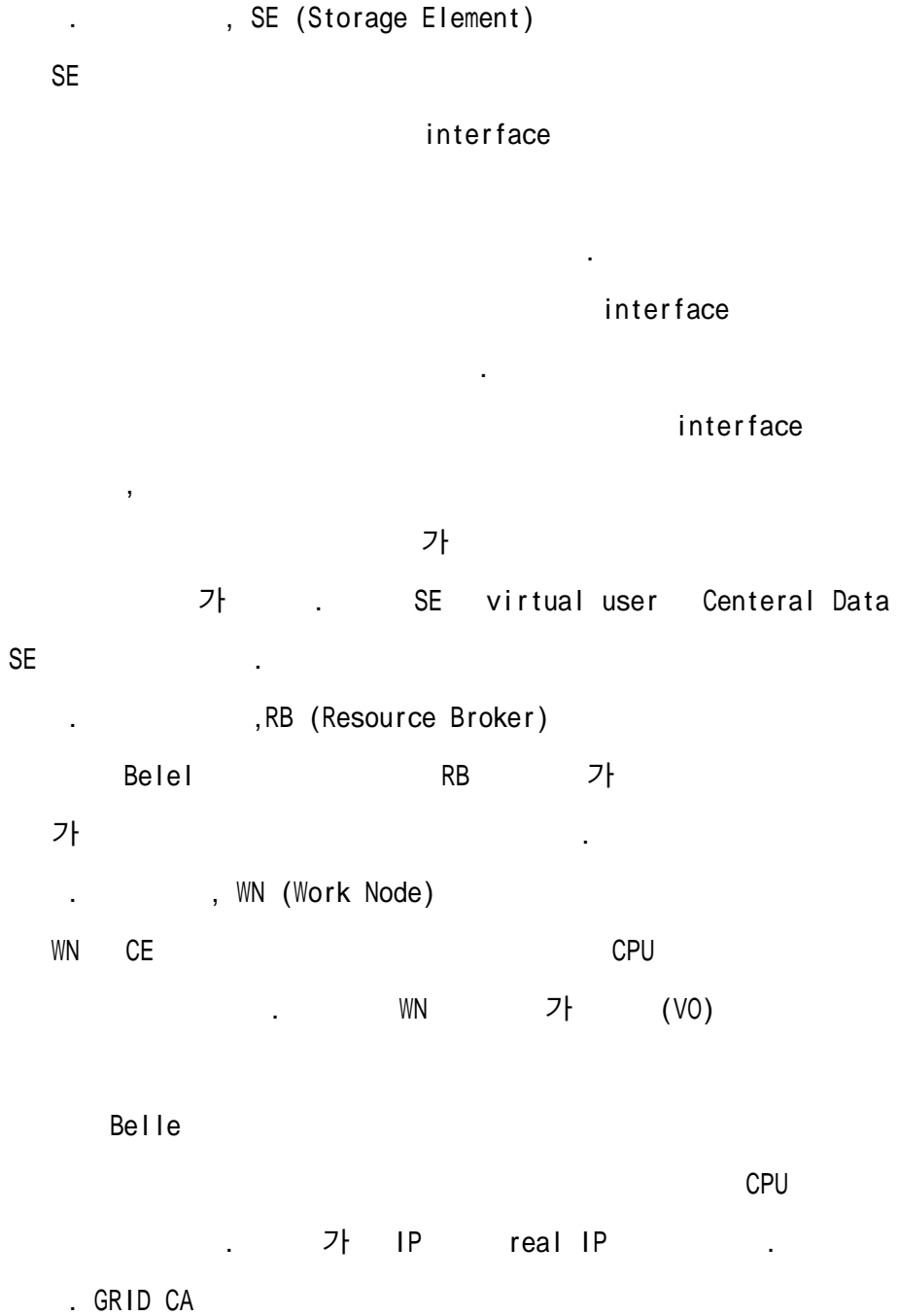


2 Korean Belle Data Grid

가. AICUS (Auto Installation Configuration and Update System)

AICUS Redhat
 Kick Start Belle Group
 Globus tool kit





UI Belle Data Grid

,

. CE SE

가 .

. CE (Computing Element)

CE(Computing Element) , Belle

batch job system openpbs 가 .

Belle computing farm Monte Carlo

Simulation analysis user job

, , job batch job

system

. Belle computing power가

. Belle computing power가

Monte Carlo simulation Linux PC

가 .

KISTI Korea Grid

Project High Energy Physics Data Grid

, Belle Library Data Grid

,

Belle

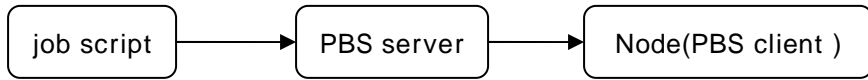
computing power Grid Belle

Clusters method fork MPI³

³ MPI source level . MPI . MPI 40

Grid CE

Batch Job



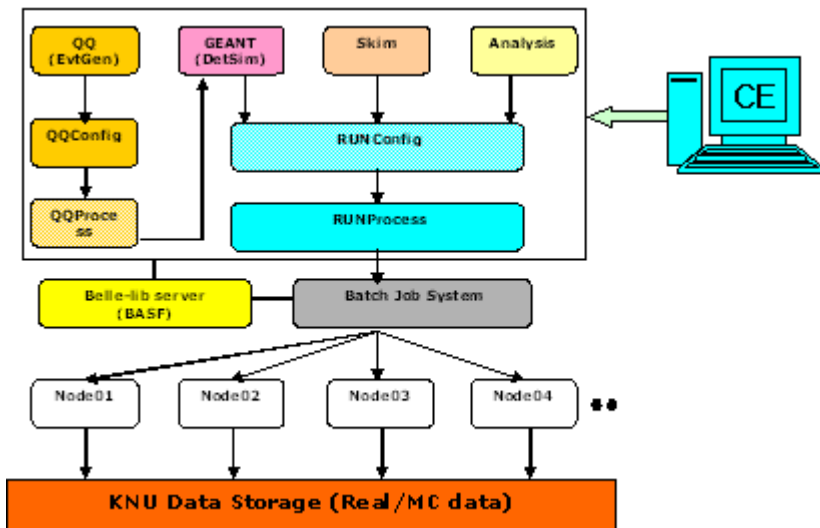
4 PBS

script node
batch job system 가

Belle Data Grid job

script PBS Belle-Cluster2.0

MPI forum , 1992 MPI 1.0 MPI 2.0
 LamMPI MPI Argonne National Laboratory Ohio supercomputer center
 MPICH가



5 CE

Belle-Cluster2.0

CE

grid-mapfile

globus-gatekeeper

. SE (Storage Element)

nfs scp grid-ftp

. WN (Work Node)

Redhat

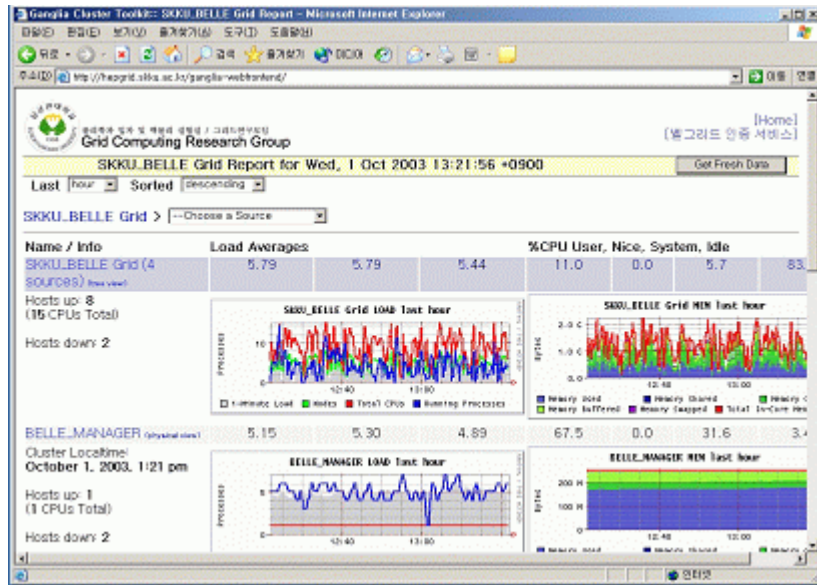
globus tool kit

openpbs client

CE

. RB (Resource Broker)

가



6

. AICUS (Auto Installation Configuration and Update System)

AICUS

RedHat

가

globus-tool

kit

hepgrid.skku.ac.kr

가 가

prun update

. Grid CA

Belle

Grid

KISTI

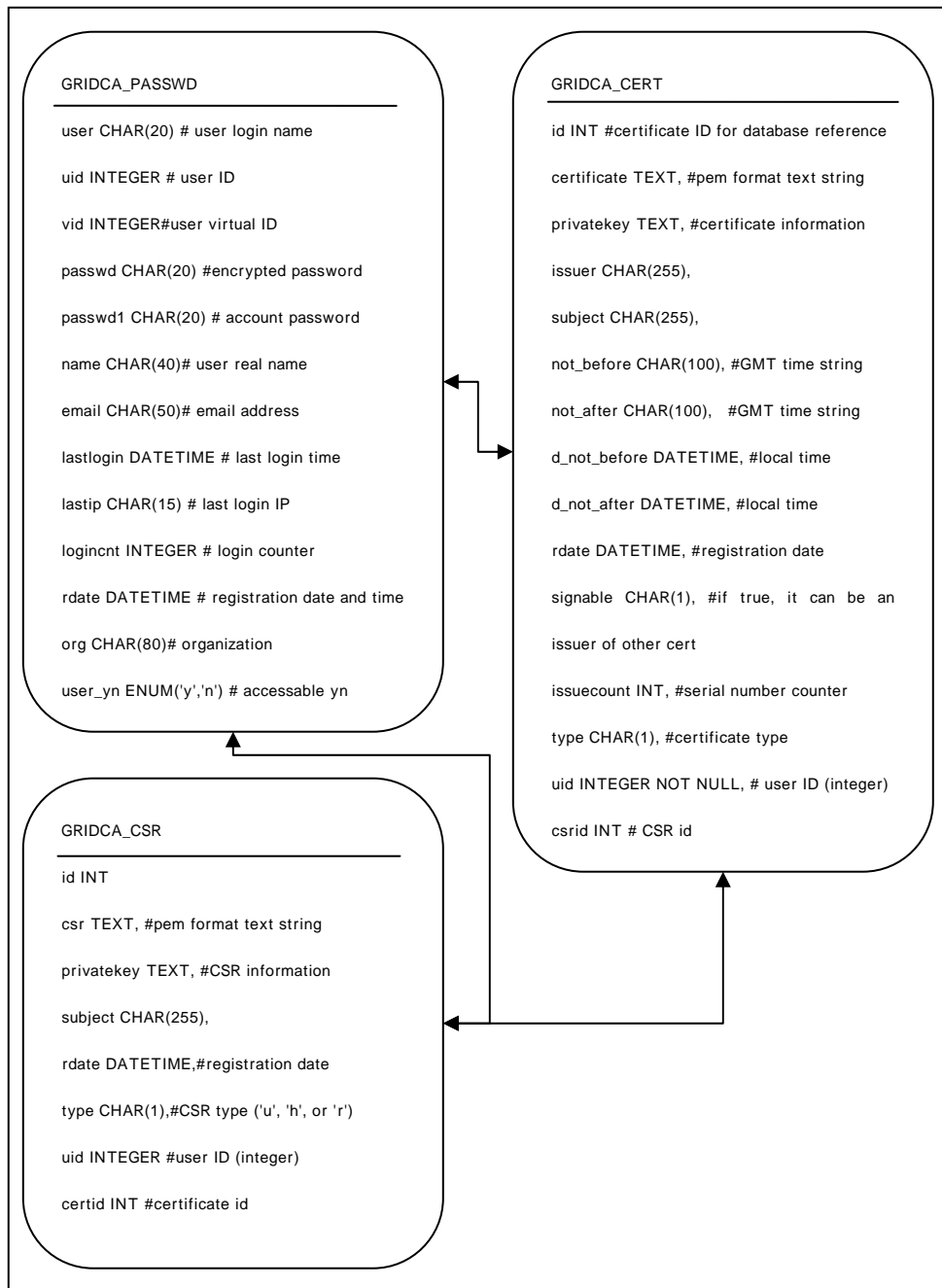
gridca-1.0.0 Data Grid

UI request , host
request .

가 .

3. UI

3.1. UI Database



7 ERD

가

4

3.2.

3.2.1. 가

Korean belle Data Grid

가

Belle

가

가 Belle

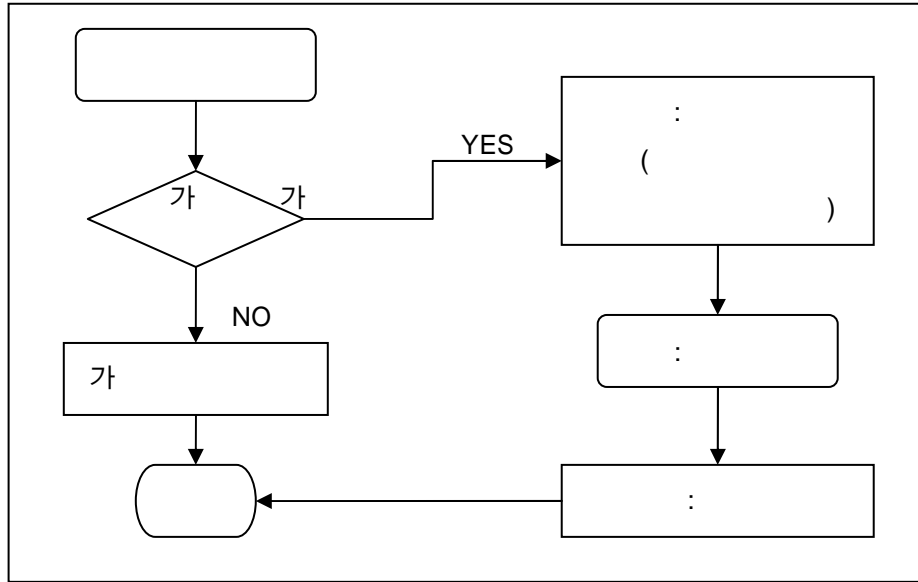
Grid System

RootCA

가

Belle Data

Grid System



8 가

3.2.2.

Korean Belle Data Grid System

CE host, SE host,

FTP

FTP

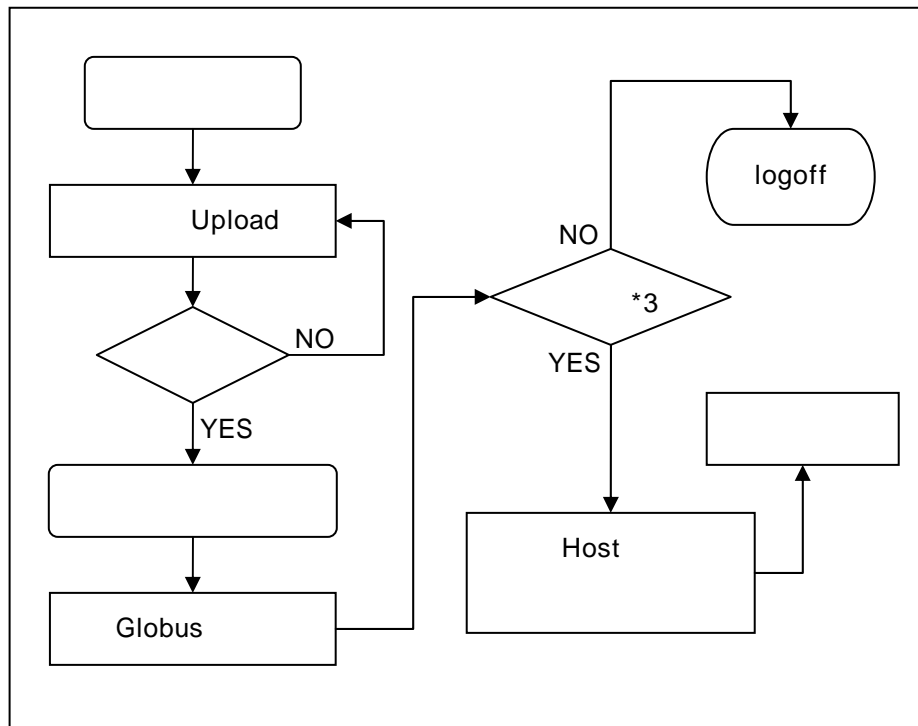
FTP

Globus

3

가

logoff



9

3.2.3.

CE

4. UI

. SE 가

Grid-Ftp .

4.2.

3

. 가

.
가

Nobody

가

가

.
가 가

PC

WWW

FTP

가

work_dir,

conf

```

...
if [ -z "`cat /etc/passwd | grep $USERNAME`" ]; then
  UserControl [username]4 /usr/sbin/adduser $USERNAME -p $PASSWD -g
  $GROUP -d /home/$USERNAME

  UserControl [username] /usr/bin/passwd --stdin $USERNAME <<EOF
  $PASSWD
  EOF
...

```

3 File : add-user-www.sh

```

...
if [ -n "`cat /etc/passwd | grep $USERNAME`" ];then
  UserControl [username] /usr/sbin/userdel $USERNAME
  UserControl [username] /bin/rm -rf /home/$USERNAME
fi
...

```

4 File : del-user-www.sh**4.2.2.**

/

가

Belle

가

RSA

openSSL5

```

...
#
openssl-0.9.6j/bin/openssl genrsa -des3 -passout file:passwd.txt
1024 > /tmp/gridca_01010222/key.txt

#csr
openssl-0.9.6j/bin/openssl req -config script_path/openssl_config
-new -key key.txt -passin file:passwd.txt < data.txt > csr.txt
...

```

5 File : Makeusercsr.php

X.509

...

⁵ OpenSSL Secure Sockets Layer Transport Layer Security
Open Source . OpenSSL Eric A. Young Tim J. Hudson
SSLeasy , OpenSSL - 0.9.6 가 ,
Unix Windows, OpenVMS, MacOS

```

#
openssl-0.9.6j/bin/openssl x509 -req -CAserial
/tmp/gridca_01010222/serial.txt -CA /tmp/gridca_01010222/cacert.txt
-days 365 -CAkey /tmp/gridca_01010222/cakey.txt -in
/tmp/gridca_01010222/csr.txt -passin file:passwd.txt >
/tmp/gridca_01010222/cert.txt
...

```

6 File : Sign.php

가 .

```

...
UserControl [username] /bin/cp -Rf $USERCERT
/home/$USERNAME/.globus/usercert.pem
UserControl [username] /bin/cp -Rf $USERKEY
/home/$USERNAME/.globus/userkey.pem
...

```

7 File : cert-copy-www.sh

4.2.3.

Korean Belle Data Grid System

가 .

CE SE

3

가

가

가

FTP

```

# FTP
function SaveToFileAsFtp(
{
    global $env;
    $ftp_dir = / ;
    $ftp_con = FTPConnect( );
    ftp_chdir($ftp_con, $ftp_dir);
    $ftp_up = ftp_put($ftp_con, , ,FTP_BINARY);
    if(!$ftp_up)
    {
        FTPClose($ftp_con);
        Error("Cannot Upload file!!");
    }
    FTPClose($ftp_con);
}
#
function RmToFileAsFtp(
{
    global $env;
    $ftp_dir = / ;

```

```

$ftp_con = FTPConnect(
);
ftp_chdir($ftp_con, $ftp_dir); //
$res = ftp_delete($ftp_con,
);
FTPClose($ftp_con);
}

```

8 File : ftp.php

가

3

9

가 /tmp/ .log

3

가

10

```

...
UserControl [username] grid-proxy-init-bin -pwstdin <<EOF >
/tmp/init.$USERNAME.log
$USERKEY
EOF

if [ -z "`cat /tmp/init.$USERNAME.log | grep Done`" ]; then
echo "1" > /homepage/html/GridCA/tmp/init.$USERNAME.log
fi

```

```
...
```

9 File : grid-init-www.sh

```
...
$i = 0;
$filename = "./tmp/init.          .log";
...
for ($i = 0; $i < 3; $i++) //3
{
    $cmd = "$shell_file          > /tmp/aaa.out";
    CommandExe($cmd, $out);

    LoadFromFile($filename, &$array, &$content);
    $arr_content = split("\n",$content);
    if ($arr_content[0] == 0) break;
        UnlinkFiles(array($filename));
}
if ($i >= 3 ) ErrorRedir("          ..","logout.php");
$i = 0;
...
```

10 File : jobrun.php

```
UI
```

```
CE SE
```

```
Grid-Ftp
```

```
SE
```

```
CE
```

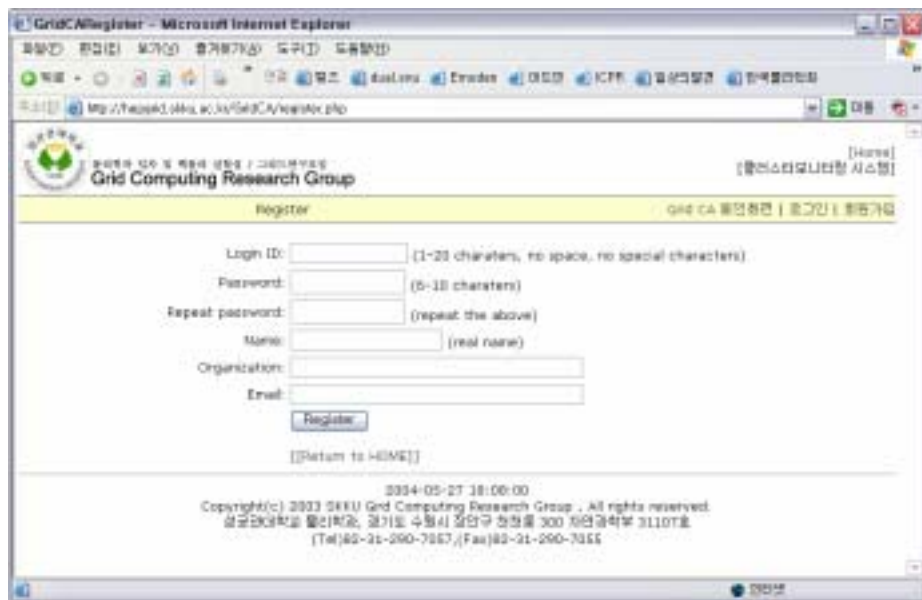
```
UI
```

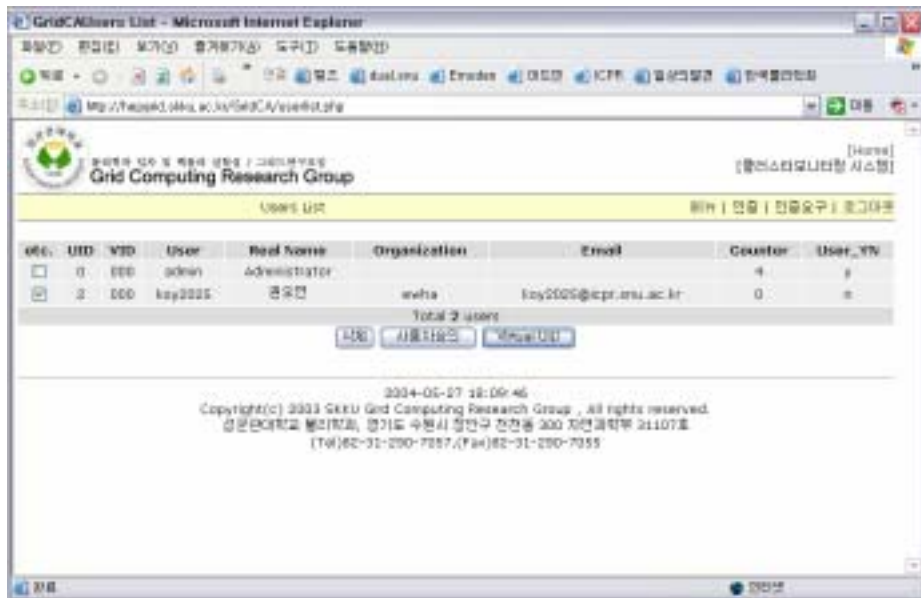
4.3.

4.3.1. 가

UI

가





11 -

10

12

```

hepgrid.skku.ac.kr - hepgrid - SSH Secure Shell
File Edit View Window Help
Quick Connect Profiles
SSH Secure Shell 3.2.0 (Build 267)
Copyright (c) 2000-2002 SSH Communications Security Corp - http://www.ssh.com/

This copy of SSH Secure Shell is a non-commercial version.
This version does not include PKI and PKCS #11 functionality.

Last login: Thu May 27 19:21:14 2004 from 147.46.24.240
[root@hepgrid root]# cd /home/
[root@hepgrid home]# ls
jh0425 khcho kinsm koy koy2025 ksm7507 ohyoua ohyoua.org test
[root@hepgrid home]# cd koy2025
[root@hepgrid koy2025]# ls
conf public_html www-workdir
[root@hepgrid koy2025]#

```

Connected to hepgrid.skku.ac.kr SSH2 - aes128-cbc - hmac-md5 80x24

12

Koy2025

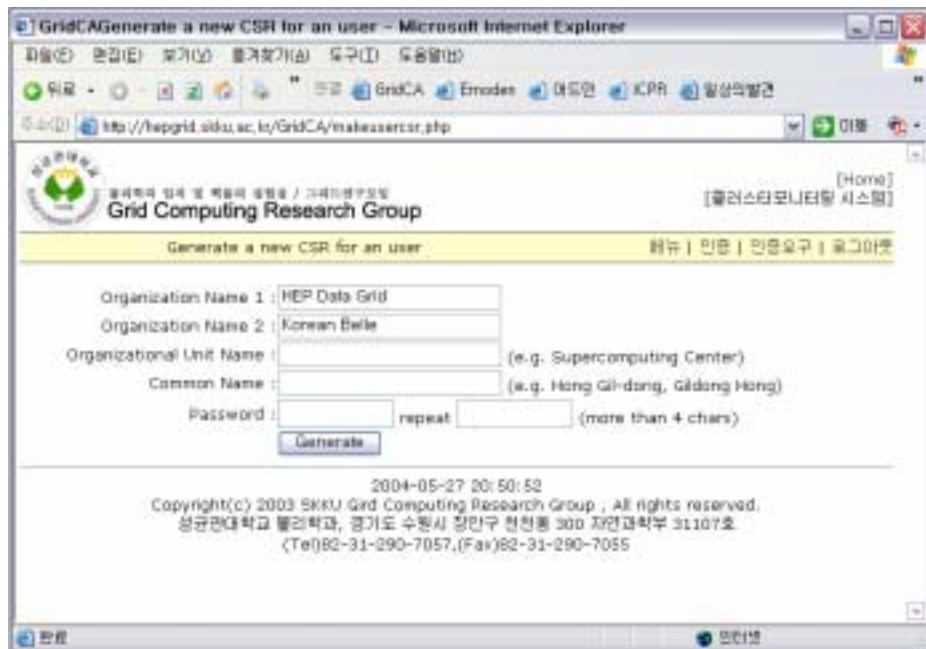
가

Conf

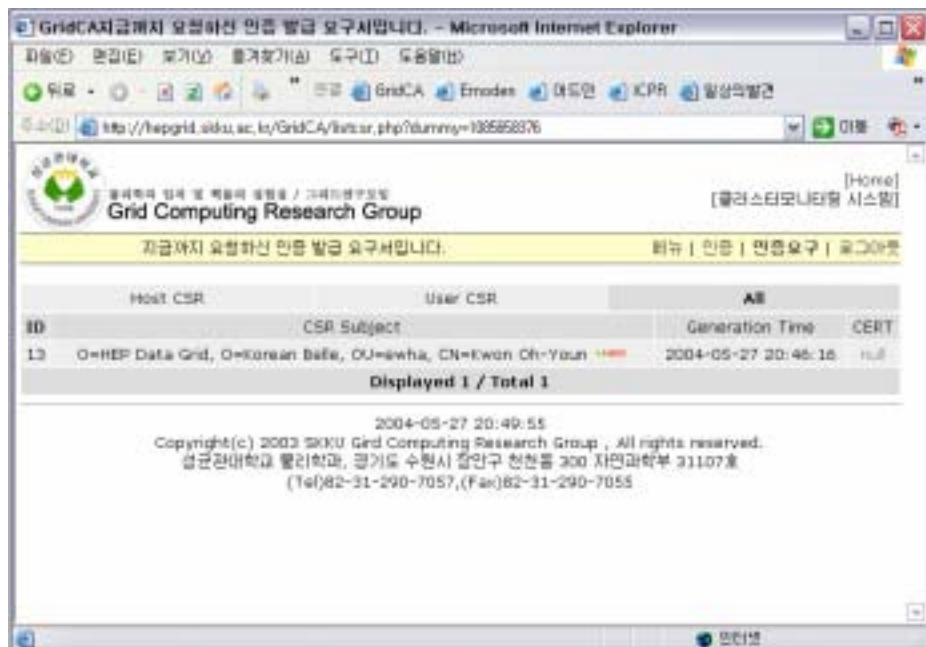
www-workdir

4.3.2.

/



13



14



15

15

CSR

가


```

4hepgrid.skku.ac.kr - hepgrid - SSH Secure Shell
File Edit View Window Help
Quick Connect Profiles

Last login: Thu May 27 21:02:53 2004 from 147.46.24.240
[root@hepgrid root]# cd /home/koy2025
[root@hepgrid koy2025]# ls -al
total 56
drwxr-xr-x  7 koy2025 BelleUsers 4096 5월 27 21:01 .
drwxr-xr-x 11 root      root      4096 5월 27 19:54 ..
-rwxr-xr-x  1 koy2025 BelleUsers   24 5월 27 19:54 .bash_logout
-rwxr-xr-x  1 koy2025 BelleUsers  191 5월 27 19:54 .bash_profile
-rwxr-xr-x  1 koy2025 BelleUsers  124 5월 27 19:54 .bashrc
-rwxr-xr-x  1 koy2025 BelleUsers  237 5월 27 19:54 .cshrc
drwxr-xr-x  2 koy2025 BelleUsers 4096 5월 27 21:01 .globus
-rwxr-xr-x  1 koy2025 BelleUsers  120 5월 27 19:54 .gtkr
drwxr-xr-x  3 koy2025 BelleUsers 4096 5월 27 19:54 .kde
-rw-r----- 1 koy2025 BelleUsers   69 5월 27 19:54 .rhosts
-rwxr-xr-x  1 koy2025 BelleUsers  220 5월 27 19:54 .zshrc
drwxrwxrwx  2 koy2025 BelleUsers 4096 5월 27 19:54 coat
drwxr-xr-x  2 koy2025 BelleUsers 4096 5월 27 19:54 public_html
drwxrwxrwx  2 koy2025 BelleUsers 4096 5월 27 19:54 www-workdir
[root@hepgrid koy2025]# cd .globus/
[root@hepgrid .globus]# ls
usercert.pem  userkey.pem
[root@hepgrid .globus]#

```

Connected to hepgrid.skku.ac.kr SSH2 - aes128-cbc - hmac-md5 80x24

16

16

./globus

usercert.pem

userkey.pem

.

4.3.3.

가

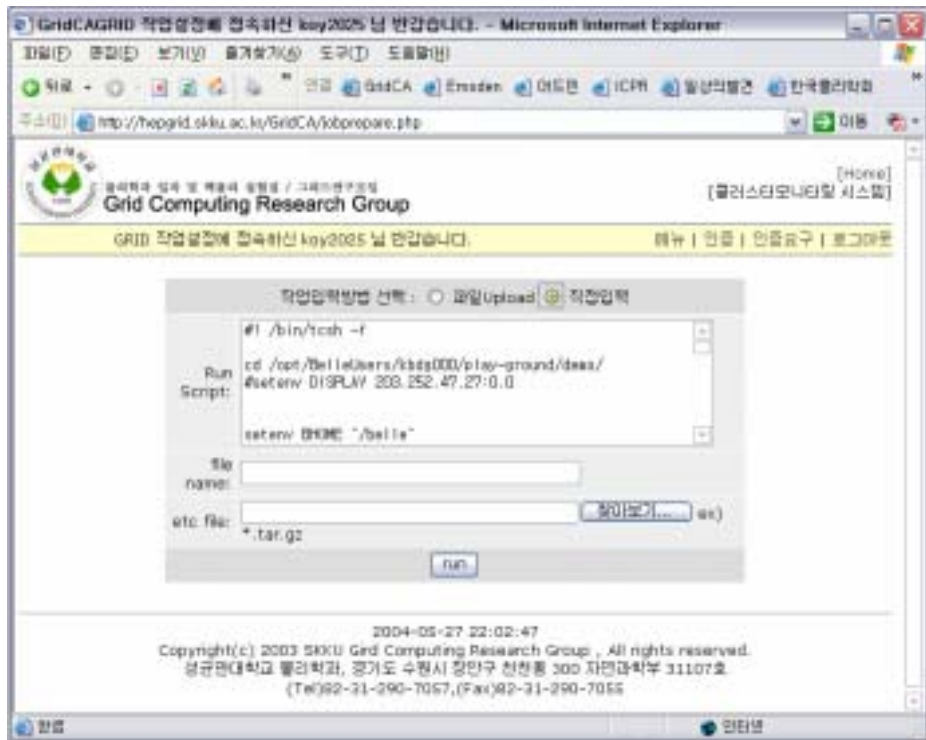


17

1

17 가

..



18

2

18 가



19 1

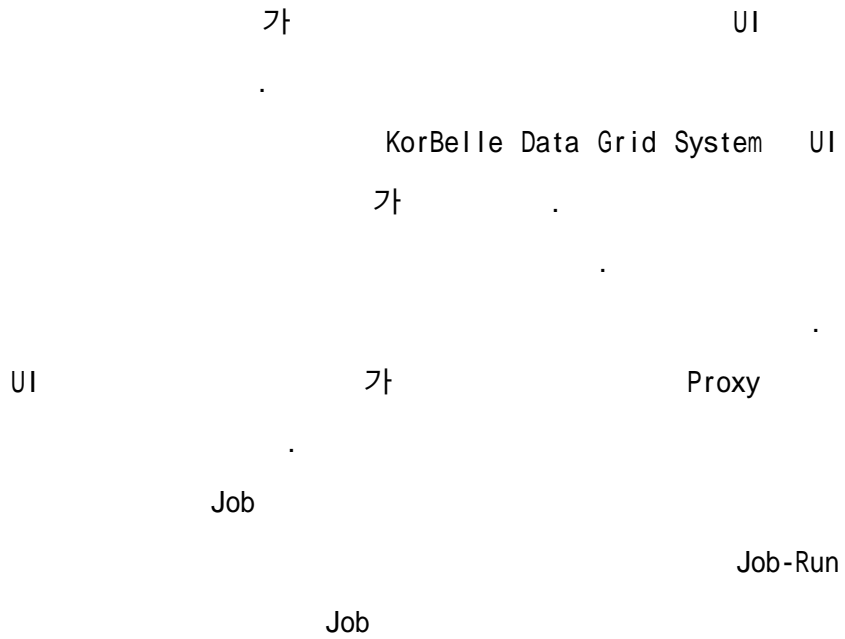
17 18

UI

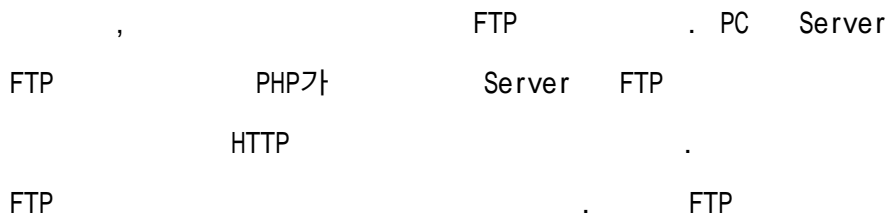
가

5.

5.1.



5.2.



PHP

가

.

,

가

.

가

.

가

UI가

가

.

- [1] 가 , / ,
2001. 5.
- [2] 가 ,
, 2003.12
- [3] , , ,
, VOL.31 NO.01, 2004.04
- [4] , , ,
JCML GUI , A,
VOL.31 NO.03 , 2004.04
- [5] , , , , , , ,
2003 ,VOL. 30 NO. 01 pp. 0000 ~ 0000
2003 . 04
- [6] Jia Ha, Seogjin Ahn, Jin Wook Chung, Il Sun Hwang, Kuinam J. Kim, Dong Kyun Kim, Hyuk Ro Lee, The Design and Implementation of Monitoring System for Grid Network, 2003 . 12
- [7] , , , , , , , ,
, VOL.30 NO.2-1, 2003 . 10
- [8] 2002 7
- [9] Fran Berman, Geoffrey Fox, Hey Anthony J. G., Tony Hey ,Grid Computing: Making the Global Infrastructure a Reality ,2003
- [10] <http://www.gridforum.org>
- [11] <http://globus.org>
- [12] <http://www.gridforumkorea.org>
- [13] <http://www.gridcenter.or.kr>
- [14] <http://www.eurogrid.org>
- [15] <http://www.apgrid.org>
- [16] <http://www.ipg.nasa.gov>
- [17] <http://www.ngrid.or.kr>

- [18] Beob-Kyun Kim, Seung-Jong Chung, Dong-Un An, Haeng-Jin Jang, Hyung-Woo Park, A Study on Access Control System for Site Autonomy in Grid Environment, 2003
- [19] PHP Programming Bible, , , 2001

ABSTRACT