I. Purpose

This is the Phase I test report. From the Planning Document and project Description Document, the purpose is: try to understand the interoperability issues of GRIS/GIIS with different schemas and the interoperability of different versions of MDS (MDS 2.2.4, MDS 2.4). The following questions will be answered:

(1). What happens when two GRISs with different MDS schema report to the same GIIS?
(2). What happens when two GIIS servers with different schemas report to the same hierarchical GIIS? What information is available for query?
(3). Under what circumstances do MDS2.4 and MDS 2.4 GRIS/GIIS servers interoperate?

II. Schema and Software Used

The following schemas and software are used:

1. Grid3 schema;
2. LCG-2 schema;
3. A subset of Grid3 information provider: grid-info-grid3-site;
4. A subset of LCG-2 information provider: edg-info-site;
5. MDS2.4 from www.globus.org (VDT with the MDS2.4 has not been released yet);
6. MDS2.2.4 from VDT1.1.12;

The reason to use the grid-info-grid3-site and edg-info-site information providers is: the corresponding schema is needed to publish the information generated by these information providers; we can track where original information is generated by using the site info contained in the published site info.

III. Testing setup and results

(I). What happens when two GRISs with different MDS schema report to the same GIIS?

1. Setup
2. Test results

(1). If the GRIS doesn’t have the schema required by the information provider (IP), the information from IP will not be published. The objectClass still shows up with no real result:

-------------
[yujun@yamashita ~/mds24]$ grid-info-search -x -h gyoza1.fnal.gov -b "mds-vo-name=local, o=grid"
......
# gyoza1, local, grid
dn: Grid3SiteName=gyoza1, Mds-Vo-name=local, o=grid
objectClass: Grid3Element
objectClass: Grid3Site
Mds-validfrom: 20040203231007Z
Mds-validto: 20040204231007Z
Mds-keepto: 20040206180327Z
-------------

After adding the corresponding schema into the local GRIS, the result publishes correctly.

(2). When two GRISs report to the Level 1 GIIS:
If the schema is presented in the GIIS, the corresponding information from the GRIS will show up correctly:

```bash
[yujun@yamashita ~/mds24]$ grid-info-search -x -h ramen.fnal.gov -b "Mds-Vo-name=ramen,o=grid" '(objectClass=SiteInfo)'
version: 2

# filter: (objectClass=SiteInfo)
# requesting: ALL
#
# gyoza6.fnal.gov/siteinfo, ramen, Grid
dn: in=gyoza6.fnal.gov/siteinfo,Mds-Vo-name=ramen,o=Grid
objectClass: SiteInfo
objectClass: DataGridTop
objectClass: DynamicObject
siteName: FNAL-LCG2
sysAdminContact: yujun@fnal.gov
userSupportContact: yujun@fnal.gov
siteSecurityContact: yujun@fnal.gov
dataGridVersion: LCG-2_0_0
installationDate: 20040108115700Z

# search result
search: 2
result: 0 Success

# numResponses: 2
# numEntries: 1
```

If the schema is not included in the GIIS, the information will not show up. If two schemas are presented, the information from the GRIS with Grid3 schema and from the GRIS with LCG schema both show up correctly. Otherwise, only the objectClass name can be seen (with no real data):

```bash
[yujun@yamashita ~/mds24]$ grid-info-search -x -h ramen.fnal.gov -b "Mds-Vo-name=ramen,o=grid"
```

```
# gyoza1, ramen, Grid
dn: Grid3SiteName=gyoza1, Mds-Vo-name=ramen,o=Grid
objectClass: Grid3Element
objectClass: Grid3Site
Mds-validfrom: 20040204155357Z
Mds-validto: 20040205155357Z
Mds-keepto: 20040207104717Z

```

```
# gyoza6.fnal.gov/siteinfo, ramen, Grid
dn: in=gyoza6.fnal.gov/siteinfo,Mds-Vo-name=ramen,o=Grid
objectClass: SiteInfo
```
The same applies to the Level 2 GIIS. Actually, if either of the schemas in the Level 1 GIIS is missing, the published data cannot show up in the final GIIS and cannot be searchable.

(II). What happens when two GIIS servers with different schemas report to the same hierarchical GIIS? What information is available for query?

1. Setup

![Diagram of GIIS servers with different schemas reporting to a Level 2 GIIS.]

2. Test results

When two GIISs with different schema report to the same GIIS, all the GIISs are still functioning fine. However, some of the information get lost when the needed schema are not available. The following are some results:

(1). When there are no Grid3 schema, and no LCG schema on the Level 2 GIIS:

```
# gyoza6.fnal.gov/siteinfo, shahzad, grid3_lcg_test1, Grid
```
No real data are available. Only the objectClass show up.

(2). If only one schema, for example, Grid3 schema is installed, the information associated with Grid3 schema are available, but not the ones with LCG schema:
(3). If both Grid3 schema and LCG schema are installed, all the information from both GIISs are available:

```
[yujun@yamashita ~/mds24]$ grid-info-search -x -h ninomiya.fnal.gov -b "Mds-Vo-name=grid3_lcg_test1, o=Grid"

# gyoza1, ramen, grid3_lcg_test1, Grid
dn: Grid3SiteName=gyoza1, Mds-Vo-name=ramen,Mds-Vo-name=grid3_lcg_test1,o=Grid
objectClass: Grid3Element
objectClass: Grid3Site
Grid3ElementName: SiteDescription
Grid3SiteName: gyoza1
Grid3TmpDir: /tmp
Grid3WNTmpDir: /tmp
Grid3DataDir: /data1/data
Grid3AppDir: /data1/app
Grid3Dir: /data1/mds24/grid3_info
Grid3SiteInfo: PARAM1,
Grid3SiteInfo: PARAM2
Grid3JobContact: gyoza1.fnal.gov/jobmanager-fbsng
Grid3UtilContact: gyoza1.fnal.gov/jobmanager
Grid3SiteSponsor: USCMS
Mds-validfrom: 20040204201806Z
Mds-validto: 20040205201806Z
Mds-keepto: 20040207151126Z

# gyoza1, ramen, grid3_lcg_test1, Grid
dn: Grid3SiteName=gyoza1, Mds-Vo-name=ramen,Mds-Vo-name=grid3_lcg_test1,o=Grid
objectClass: Grid3Element
objectClass: Grid3Site
Grid3ElementName: SiteDescription
Grid3SiteName: gyoza1
Grid3TmpDir: /tmp
Grid3WNTmpDir: /tmp
Grid3DataDir: /data1/data
Grid3AppDir: /data1/app
Grid3Dir: /data1/mds24/grid3_info
Grid3SiteInfo: PARAM1,
Grid3SiteInfo: PARAM2
Grid3JobContact: gyoza1.fnal.gov/jobmanager-fbsng
Grid3UtilContact: gyoza1.fnal.gov/jobmanager
Grid3SiteSponsor: USCMS
Mds-validfrom: 20040204201806Z
Mds-validto: 20040205201806Z
Mds-keepto: 20040207151126Z
```

......
(4). If a specific schema in the middle GIIS is missing, the information will also not be viewable in the higher-level GIIS. For example, after we removed the Grid3 schema on ramen and kept the Grid3 schema at Level 2 GIIS, we can still see the information provided by LCG schema, but not the Grid3 schema any more:

```
[yujun@yamashita ~/mds24]$ grid-info-search -x -h ninomiya.fnal.gov -b "Mds-Vo-name=grid3_lcg_test1, o=Grid"
......
# gyoza1, ramen, grid3_lcg_test1, Grid
dn: Grid3SiteName=gyoza1, Mds-Vo-name=ramen,Mds-Vo-name=grid3_lcg_test1,o=Grid
objectClass: Grid3Element
objectClass: Grid3Site
Mds-validfrom: 20040204202713Z
Mds-validto: 20040205202713Z
Mds-keepto: 20040207152033Z
..........
```

(III). Under what circumstances do MDS2.2.4 and MDS 2.4 GRIS/GIIS servers interoperate?

1. Setup

We installed MDS2.2.4 on yamashita.fnal.gov from VDT1.1.12, then did several tests by combining different versions of GRIS, GIIS and client program.

2. Test results

(1). Using yamashita (MDS2.2.4) as the client program to query a MDS2.4 GIIS

There is no problem to query the MDS2.4 GIIS.
(2). Use yamashita(MDS2.2.4) as a GRIS
When MDS2.2.4 acts as a GRIS, there is no problem either query from a MDS2.2.4 client or MDS2.4 client.

(a). Query from its own client
Grid3TmpDir: /tmp
Grid3WNTmpDir: /tmp
Grid3DataDir: /home/globus/data
Grid3AppDir: /home/globus/app
Grid3Dir: /home/globus/vdt
Grid3JobContact: yamashita.fnal.gov/jobmanager-condor
Grid3UtilContact: yamashita.fnal.gov/jobmanager
Grid3SiteSponsor: USCMS
Mds-validfrom: 20040204223434Z
Mds-validto: 20040205223434Z
Mds-keepto: 20040207172754Z

# search result

# numResponses: 2
# numEntries: 1

(b). Query from a MDS2.4 client

bash-2.05a$ grid-info-search -x -h yamashita.fnal.gov
"(objectClass=Grid3Site)"
version: 2

# # filter: (objectClass=Grid3Site)
# requesting: ALL
# #
# yamashita, local, grid
dn: Grid3SiteName=yamashita, Mds-Vo-name=local,o=grid
objectClass: Grid3Element
objectClass: Grid3Site
Grid3ElementName: SiteDescription
Grid3SiteName: yamashita
Grid3TmpDir: /tmp
Grid3WNTmpDir: /tmp
Grid3DataDir: /home/globus/data
Grid3AppDir: /home/globus/app
Grid3Dir: /home/globus/vdt
Grid3JobContact: yamashita.fnal.gov/jobmanager-condor
Grid3UtilContact: yamashita.fnal.gov/jobmanager
Grid3SiteSponsor: USCMS
Mds-validfrom: 20040204223434Z
Mds-validto: 20040205223434Z
Mds-keepto: 20040207172754Z

# search result
search: 2
result: 0 Success

# numResponses: 2
# numEntries: 1
When registering yamashita.fnal.gov to a MDS2.4 GIIS, there is no problem to view the information from MDS2.2.4 GRIS.

```
[yujun@yamashita ~/mds24]$ grid-info-search -x -h ramen.fnal.gov -b "mds-vo-name=ramen, o=grid" "(objectClass=Grid3Site)"
version: 2
#
# filter: (objectClass=Grid3Site)
# requesting: ALL
#
# gyozal, ramen, Grid
dn: Grid3SiteName=gyozal, Mds-Vo-name=ramen, o=Grid
objectClass: Grid3Element
objectClass: Grid3Site
Grid3ElementName: SiteDescription
Grid3SiteName: gyozal
Grid3TmpDir: /tmp
Grid3WNTmpDir: /tmp
Grid3DataDir: /data1/data
Grid3AppDir: /data1/app
Grid3Dir: /data1/mds24/grid3_info
Grid3SiteInfo: PARAM1,
Grid3SiteInfo: PARAM2
Grid3JobContact: gyozal.fnal.gov/jobmanager-fbsng
Grid3UtilContact: gyozal.fnal.gov/jobmanager
Grid3SiteSponsor: USCMS
Mds-validfrom: 20040204221236Z
Mds-validto: 20040205221236Z
Mds-keepto: 20040207170556Z
#
# yamashita, ramen, Grid
dn: Grid3SiteName=yamashita, Mds-Vo-name=ramen, o=Grid
objectClass: Grid3Element
objectClass: Grid3Site
Grid3ElementName: SiteDescription
Grid3SiteName: yamashita
Grid3TmpDir: /tmp
Grid3WNTmpDir: /tmp
Grid3DataDir: /home/globus/data
Grid3AppDir: /home/globus/app
Grid3Dir: /home/globus/vdt
Grid3JobContact: yamashita.fnal.gov/jobmanager-condor
Grid3UtilContact: yamashita.fnal.gov/jobmanager
Grid3SiteSponsor: USCMS
Mds-validfrom: 20040204224347Z
Mds-validto: 20040205224347Z
Mds-keepto: 20040207173707Z
#
# search result
search: 2
result: 0 Success
```
(4). Register a MDS24 GRIS to yamashita (MDS2.2.4)

When all have the Grid3 schema, the information can be published correctly:

```bash
[yujun@yamashita ~/mds24]$ grid-info-search -x -h yamashita.fnal.gov -b "mds-vo-name=yamashita, o=grid" "(objectClass=Grid3Site)"
version: 2

# filter: (objectClass=Grid3Site)
# requesting: ALL
#
# yamashita, yamashita, Grid
dn: Grid3SiteName=yamashita, Mds-Vo-name=yamashita, o=Grid
objectClass: Grid3Element
objectClass: Grid3Site
Grid3ElementName: SiteDescription
Grid3SiteName: yamashita
Grid3TmpDir: /tmp
Grid3WNTmpDir: /tmp
Grid3DataDir: /home/globus/data
Grid3AppDir: /home/globus/app
Grid3Dir: /home/globus/vdt
Grid3JobContact: yamashita.fnal.gov/jobmanager-condor
Grid3UtilContact: yamashita.fnal.gov/jobmanager
Grid3SiteSponsor: USCMS
Mds-validfrom: 20040204224947Z
Mds-validto: 20040205224947Z
Mds-keepto: 20040207174307Z

# gyoza1, yamashita, Grid
dn: Grid3SiteName=gyoza1, Mds-Vo-name=yamashita, o=Grid
objectClass: Grid3Element
objectClass: Grid3Site
Grid3ElementName: SiteDescription
Grid3SiteName: gyoza1
Grid3TmpDir: /tmp
Grid3WNTmpDir: /tmp
Grid3DataDir: /data1/data
Grid3AppDir: /data1/app
Grid3Dir: /data1/mds24/grid3_info
Grid3SiteInfo: PARAM1,
Grid3SiteInfo: PARAM2
Grid3JobContact: gyoza1.fnal.gov/jobmanager-fbsng
Grid3UtilContact: gyoza1.fnal.gov/jobmanager
Grid3SiteSponsor: USCMS
Mds-validfrom: 20040204225009Z
Mds-validto: 20040205225009Z
Mds-keepto: 20040207174329Z
```
5. Register a MDS2.4 GIIS to yamashita (MDS2.2.4)

When the schema is in place, there is also no problem to view the published results:

```
[yujun@yamashita ~/mds24]$ grid-info-search -x -h yamashita.fnal.gov -b "mds-vo-name=yamashita, o=grid" "(objectClass=SiteInfo)"
version: 2
```

IV. Conclusion

The above tests give us a better understanding on the features of MDS2.4 and MDS2.2.4. It seems the schema plays an essential role when publishing the information. The schema should be available in the whole chain of GRIS and GIIS. Otherwise, the information will
not be available in the final GIIS. The following are the answers to the questions raised in
the first paragraph of the report:

**Question 1:** What happens when two GRISs with different MDS schema report to the
same GIIS?
**Answer:** The GRISs with different schema don’t interfere with the running of the GIIS.
However, if the schema in the GRIS doesn’t show up in the GIIS, the published
information in the GIIS will not be searchable when searching the GIIS.

**Question 2:** What happens when two GIIS servers with different schemas report to the
same hierarchical GIIS? What information is available for query?
**Answer:** Again, the GIISs with different schema don’t interfere with the running of the
high-level of GIIS. However, if the schema in the GIIS doesn’t show up in the reported
GIIS, the published information in the GIIS will not be available when searching the
GIIS. Further, if the needed schema is missed in one of the middle GIISs, the reported
result from the GRIS will not be reported.

**Question 3:** Under what circumstances do MDS2.2.4 and MDS 2.4 GRIS/GIIS servers
interoperate?
**Answer:** It seems MDS2.2.4 and MDS2.4 are fully interoperable. There is no problem to
query a MDS2.4 GRIS/GIIS from a MDS2.2.4 client and vice versa. We can also register
a MDS2.2.4 GRIS/GIIS to a MDS 2.4 GIIS, and register a MDS2.4 GRIS/GIIS to a
MDS2.2.4 GIIS.