

# RNS Requirements from KEK based on operational experiences using LCG/SRB/NAREGI

GFS-WG RNS & FC Standalization

Go Iwai, KEK/CRC

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*Most of slides are quoted from OGF24, but a bit fixed*

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# Outline

## 1. Introduction

- Current Situation
- What we want to do with RNS

## 2. Requirements from experiences

- What we learn from practice

## 3. Summary

# Introduction

# Grid Deployment at KEK

## Middleware/Experiment Matrix



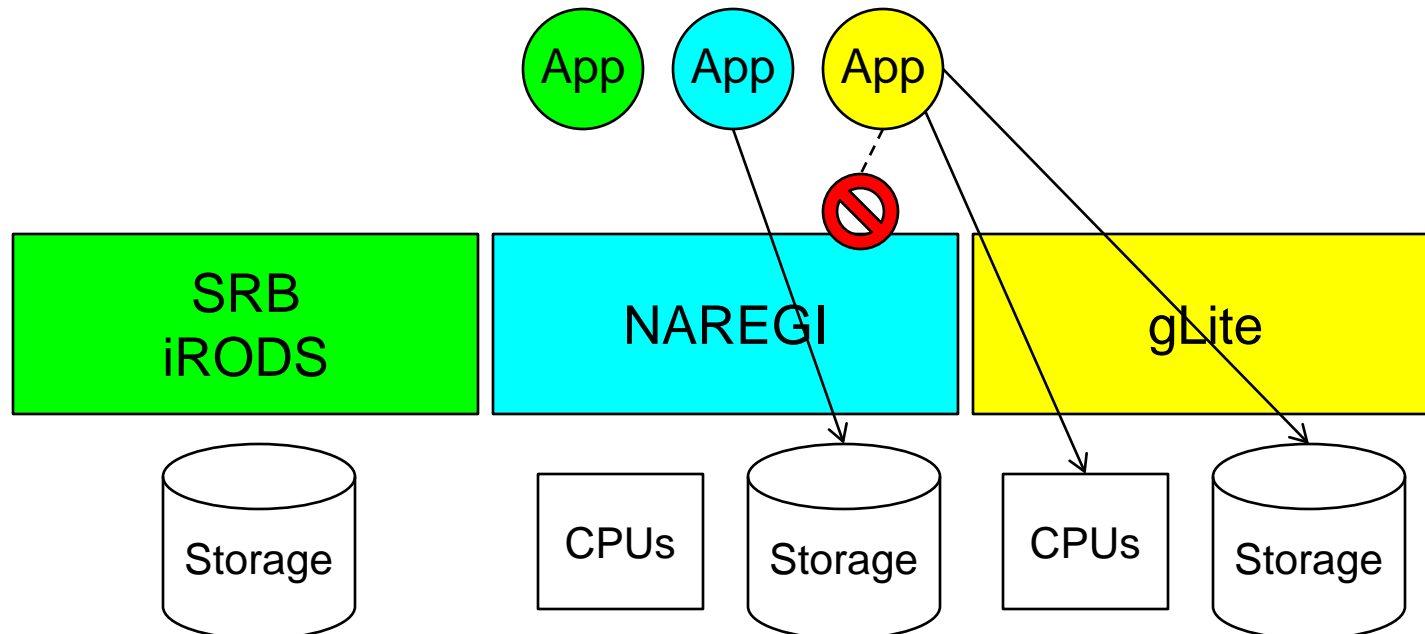
- Commonly most of experiment or federation are using gLite as the Grid middleware.
- We would like to introduce NAREGI as the general purpose e-science infrastructure
  - Difficulties: e.g. human costs, time differences
  - Both interops among MWs are mandate for us (next a few slides)
    - To provide higher availability, reliability and to keep prod. quality

	<b>gLite</b>	<b>NAREGI</b>	<b>Gfarm</b>	<b>SRB</b>	<b>iRODS</b>
<b>Belle</b>	Using	In Plan	Using	Using	
<b>Atlas</b>	Using				
<b>Radio therapy</b>	Using	In Plan	In Plan		
<b>ILC</b>	Using	In Plan	In Plan		
<b>J-PARC</b>	In Plan	In Plan	In Plan		Testing
<b>Super-Belle</b>	To be decided until 2010				

# Issues on Multi Middleware Apps

- For site admins:
  - Dedicate HW is deployed in each middleware
- For end users:
  - By ordinal way, they don't access storage using their catalogue
    - E.g. gLite users can not access by using LFN if data is stored in SRB.
  - They have to know which middleware they are using.

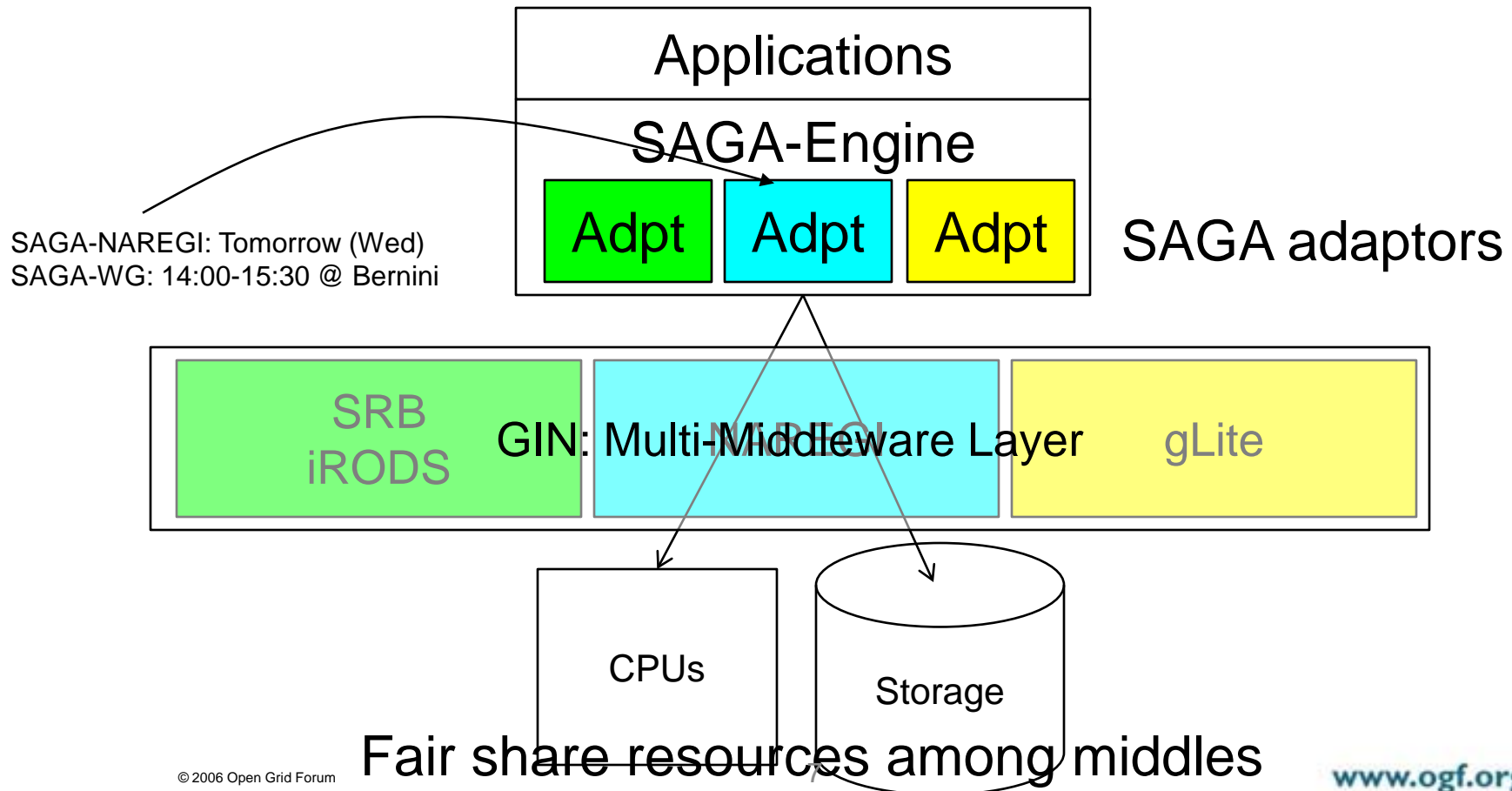
The most significant is that middle-layer can be seen from users



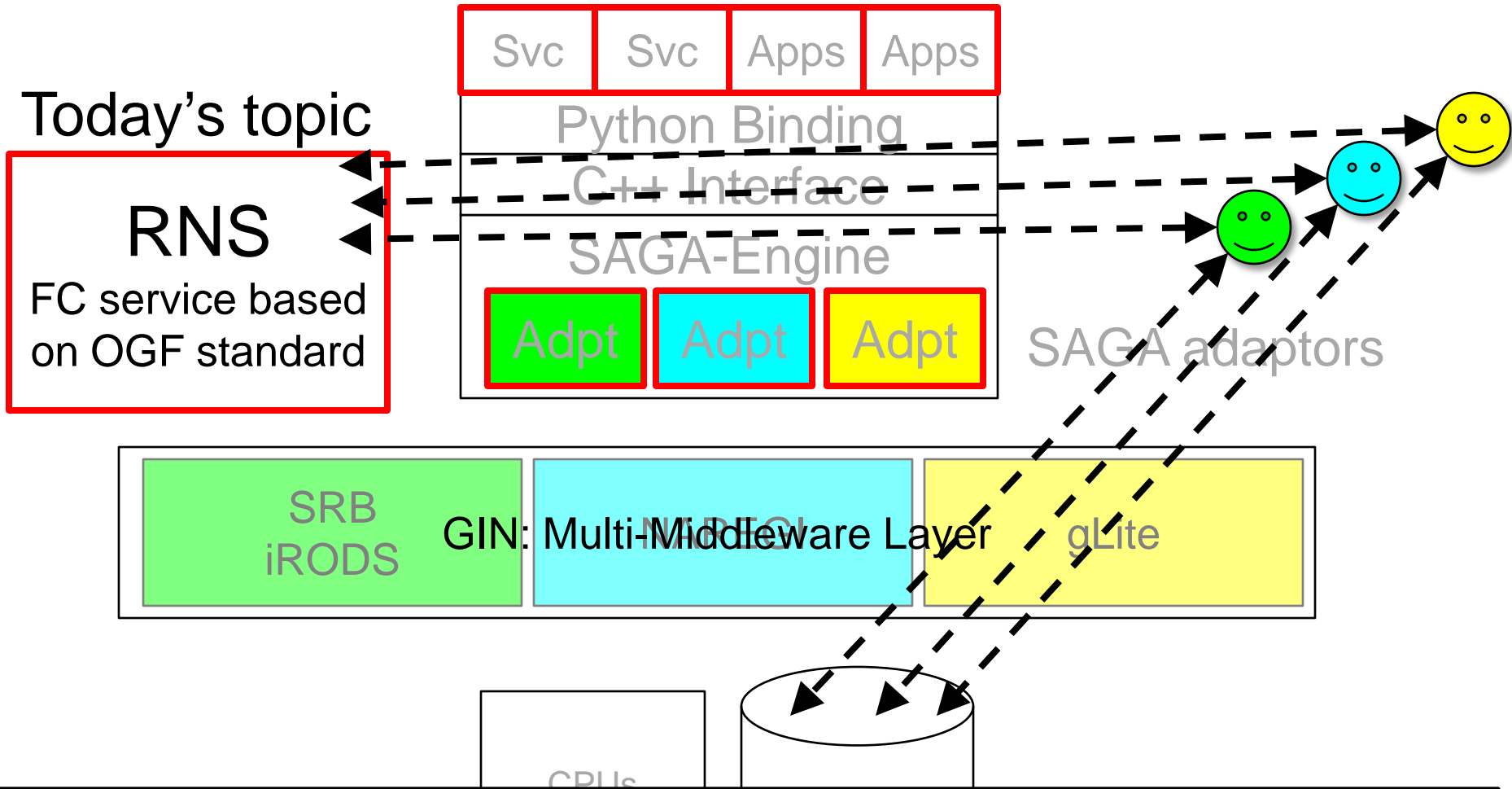
Deployed dedicate HW

# Motivation

- We need to operate multi Grid middleware at the same time.
  - Resource sharing among them is mandate
    - We are also contributing to GIN
- Virtualization of Grid middleware is our wish
  - The best scenario for the application developers



# Project Goal (focused on DG)



*Every users can access their files by looking up OGF-std-FC service  
And... they will never create same file.*

# Requirements from experiences

# Load balancing and Redundancy

- Load balancing, redundancy and fail over are required to avoid critical service down
  - Central catalogue in VO should not down especially
- Our experience on LCG/gLite
  - The only one LFC (LCG File Catalogue) can be centrally operated in each VO.
    - All users can not use it while downtime
  - Load balancing is only realized by the round robin host name resolve.
    - No fundamental mechanism

# Bulk file registration and File Naming

- RNS should keep SURLs as well as TURLs.
  - We need a mechanism to retrieve TURL elsewhere if SURL in RNS
    - (i.e. srm://xxx »» gsiftp://yyy )
- Bulk-register CLI (Command Line Interface) is necessary.
  - rns-register [-b|--bulk]

```
<rns>
  <guid name="guid:3160415c-e5ed-4f09-8787...">
    <lfn name="/grid/vo/path/to/file-A">
      <surl name="srm//srm.kek.jp/file195fa222...">
        <turl name="gsiftp//gftp-1.kek.jp:/lcg/file195fa22..." />
      </surl>
      <surl name="srm//srm.kek.jp/file195fa223...">
        <turl name="gsiftp//gftp-2.kek.jp:/lcg/file195fa23..." />
      </surl>
    </lfn>
  </guid>
</rns>
```

TURL is dynamically allocated by SRM, gently commented by Erwin. (OGF24)

\* We have only experience on DPM

# Automatic Replica Location Selection

## Example

```
% lcg-lr -v lfn:/path/to/file
srm://ccsrm02.in2p3.fr/.../w11782_03.stdhep
srm://globe-door.ifh.de/.../w11782_03.stdhep
srm://r1s06.cc.kek.jp/.../filecd912a14-8be1-423f-b55c-449cbd82d347
srm://srm-dcache.desy.de/.../w11782_03.stdhep
:
% lcg-cp --verbose lfn://path/to/file file://path/to/file
:
Source URL for copy: gsiftp://zyklop35.ifh.de:2811/.../w11782_03.stdhep
:
```

List of SURLs

Expected SURL for users at KEK

Actual TURL

## Wish in RNS

- We want to access data on really faster storage.
  - i.e. If replica exists somewhere in the world, data should be obtained from the nearest/fastest storage.
  - Faster file transfer is always key issue for us.
    - As always users are **very** sensitive for their IT services
- Attributes for transfer metric, e.g. “Physical location”, “Typical transfer speed”, are helpful for users to find the best storage.

# Metadata Requirements for typical usage

*Especially need ACL and transfer metric*

Attribute	Content
ACL	Access Control List (Grid level) GSI authentication with VOMS extension is desirable to avoid accidental incidents or nasty activities.
Physical Location	e.g. /storage/path/to/file
Transfer metric	e.g. RTT if possible.
Type of entry	Directory or file or junction
Time stamp	Last access Last modification Last status change
Size	File size
# of links	
Access counter	
SURL	Storage URL (e.g. srm://...)
Middleware ID	e.g. SRB, iRODS, gLite, NAREGI
User metadata	"Run #123"; "Calibration Run";
Access Protocol	Gsiftp, rfio, ...

# Required commands for typical usage

Name	Description
rns-ls	List directory or file entries in the RNS
rns-query	Query user specific attributes, e.g. run number, comments and so on
rns-rm	Remove a file/directory in the RNS
rns-chmod	Change access mode of a file/directory in the RNS
rns-chown	Change owner/group of a file/directory in the RNS
rns-chgrp	Change group ownership of a file/directory in the RNS
rns-set/get-acl	Set/Get ACL of a file/directory in the RNS
rns-rename	Rename a file/directory in the RNS
rns-ln	Make a symbolic link to a file/directory in the RNS
rns-mkdir	Make a directory in the RNS
<b>rns-register/unregister</b>	<b>Register/unregister file(s) or directory into/from the RNS</b>
rns-list-replica	List the replicas for a given LFN or GUID
rns-get-guid	Get the GUID(s) for a given LFN, SURL or TURL
rns-get-surl	Get the SURL(s) for a given LFN , GUID or TURL
rns-get-turl	Get the TURL(s) for a given LFN , GUID or SURL
rns-replicate	Replicate a file from SE to another SE, after then new end point is created in the RNS
rns-cp	Copy a file/directory from SE/local to local/SE

# Summary



# Summary Quoted from OGF24



\* perhaps reflecting my bias

sorted by priority order

Requirement	Priority
CLI "rns-register/rns-unregister" enabled bulk option	HIGHEST
RNS keeps SURLs as well as TURLs. RNS has an attribute for TURL.	HIGHEST
Load balancing, redundancy and fail over	HIGHER
Attributes for transfer metric e.g. "Physical location", "Typical transfer speed"	HIGH
GSI authentication with VOMS extension	HIGH

HIGH  
↑  
↓  
LOW

# Corrected Summary in OGF25



\* perhaps reflecting my bias

sorted by priority order

Requirement	Priority
CLI "rns-register/unregister" enabled bulk option	HIGHEST
TURL retrieval mechanism elsewhere if SURL in RNS	HIGHEST
Load balancing, redundancy and fail over	HIGHER
Attributes for transfer metric e.g. "Physical location", "Typical transfer speed"	HIGH
GSI authentication with VOMS extension	HIGH

HIGH  
LOW

*OGF-std-FC is our wish*

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