



Enabling Grids for E-scienceE

EGEE-II Review Interoperability: ARC

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Representing EGEE-II partner: UKBH

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www.eu-egee.org

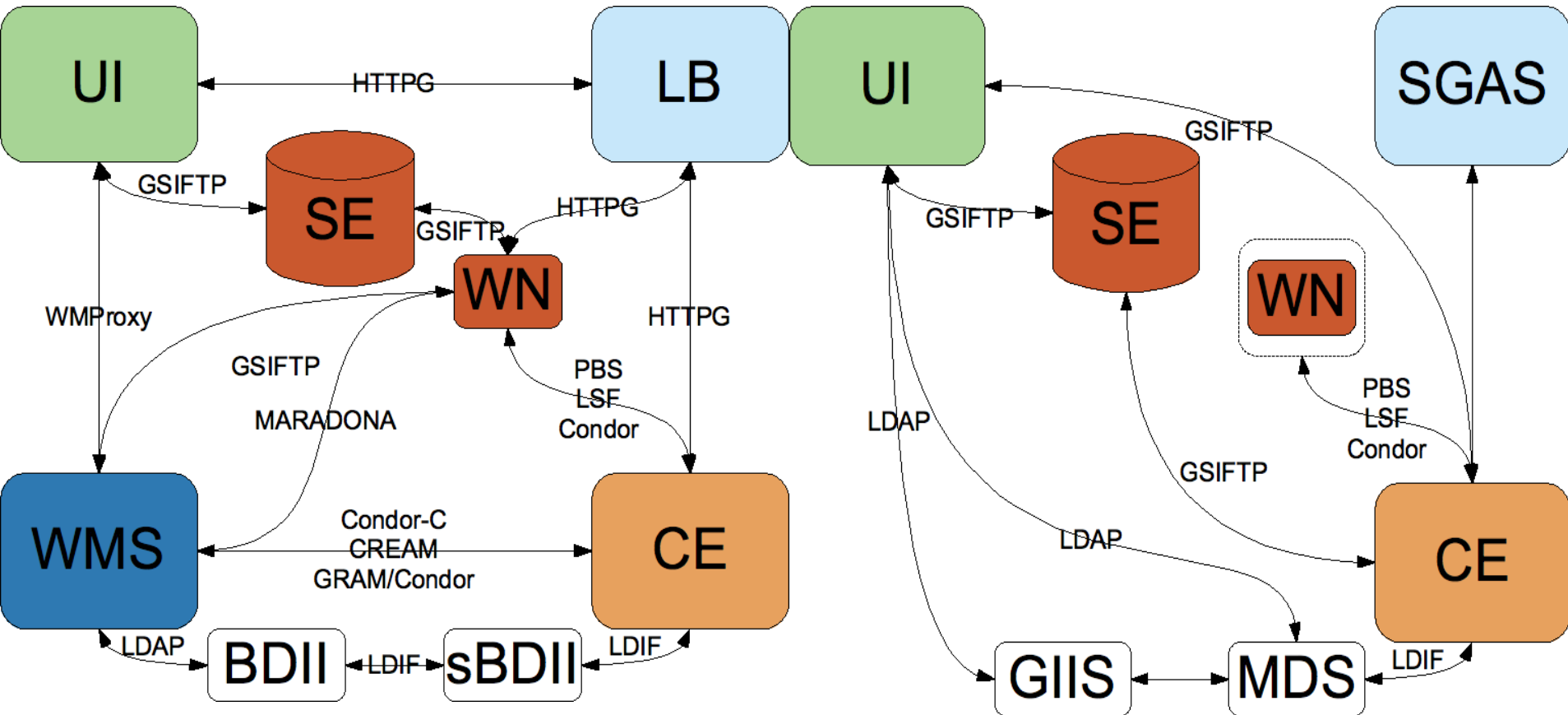


Information Society
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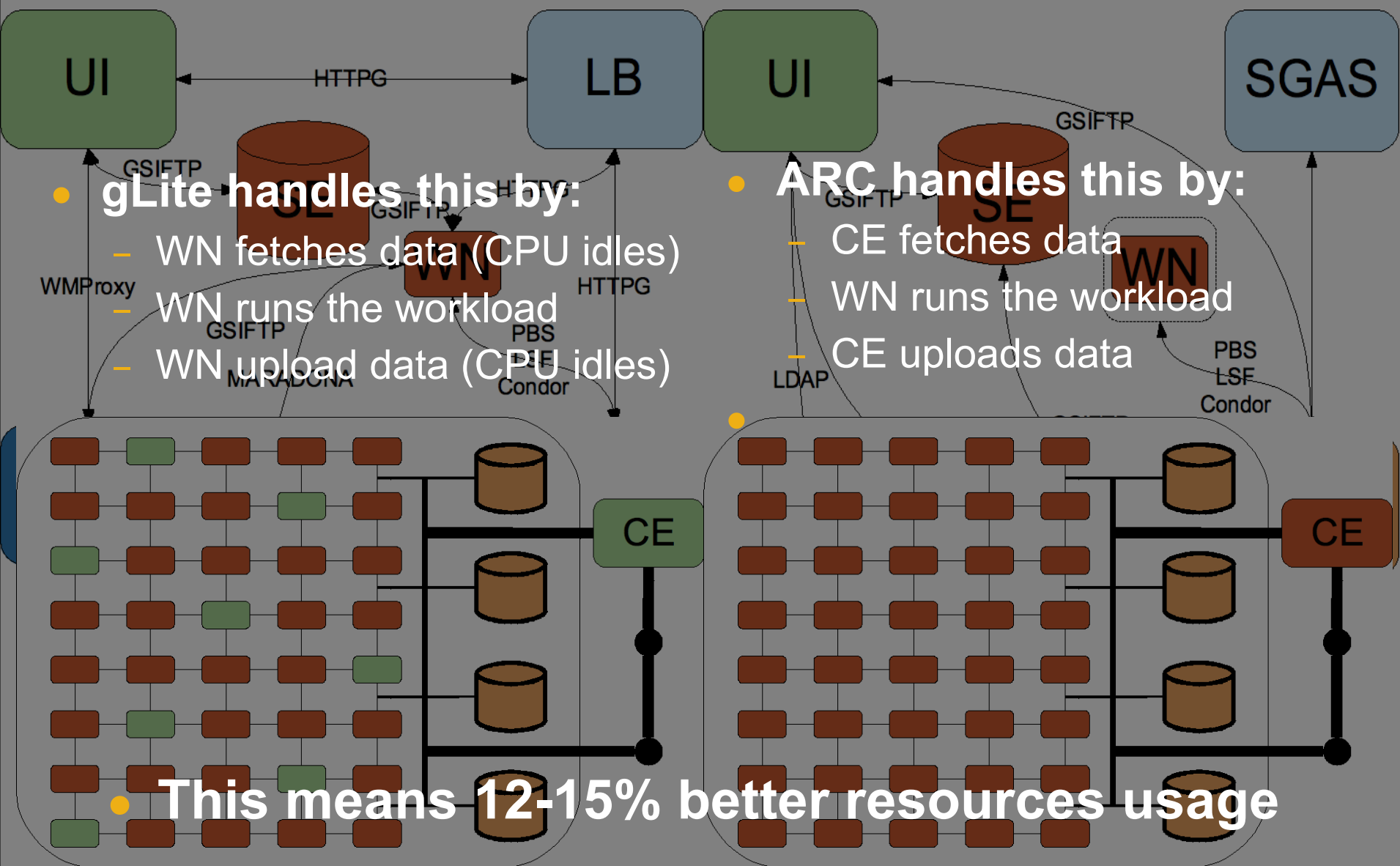
- **Motivation and goal**
- **ARC/gLite comparison**
- **Interoperability**
- **Interoperation**
- **Status and results**

- **Why not just install gLite ?**
 - ARC is deployed at >70 sites (~35000CPUs)
 - ARC runs on several OS'es
 - ARC work for other HPC users too
 - ARC resource usage 15% better
- **Why not use ARC directly ?**
 - ATLAS can - and also through PanDa...
 - Hard for smaller VOs to integrate a new grid
- **Be an integral part of the European grid !**
 - Operation, Monitoring, Accounting



- **A typical grid-job consists of:**

- Fetching data
- Running the workload
- Uploading data



- **gLite handles this by:**
 - WN fetches data (CPU idles)
 - WN runs the workload
 - WN upload data (CPU idles)

- **ARC handles this by:**
 - CE fetches data
 - WN runs the workload
 - CE uploads data

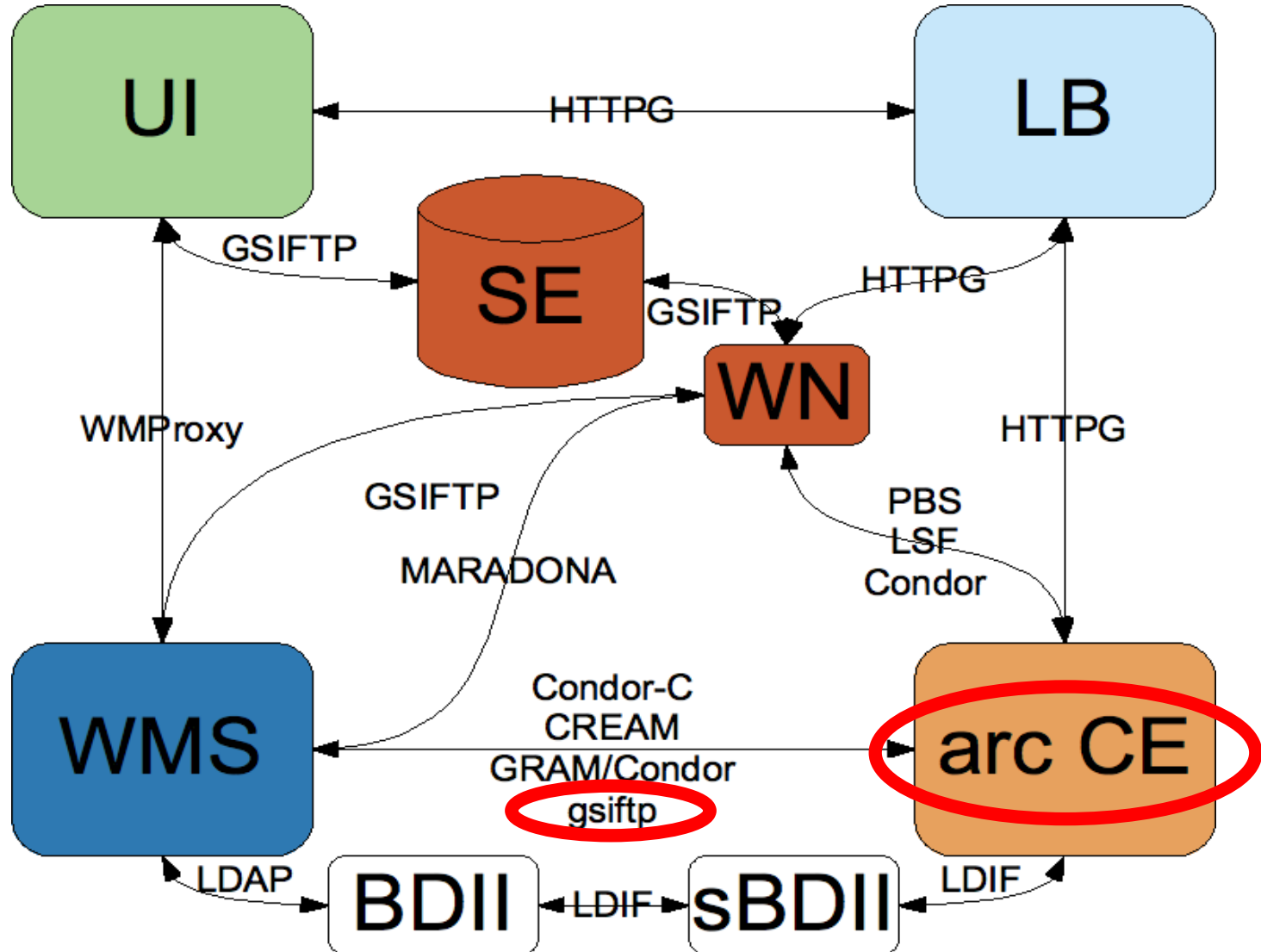
• This means 12-15% better resources usage

- **Protocol**
 - Unify protocols
- **WMS**
 - Implement ARC submission in gLite-WMS
- **Gateway**
 - Introduce a gateway between gLite and ARC
- **Co-installation**
 - deploy ARC and gLite simultaneous
- ***All exploited within SA3***

- **Current candidate: OGSA BES**
 - Implemented by INFN for CREAM CE v.1
 - Implemented by KnowARC for ARC v.1

- **HOWEVER:**
 - handles only small part of the job cycle
 - (still LB, Maradona, staging...)
 - no unification of data handling
 - will work for “hello world”
 - a lot more work needed

- ***Will not be the suitable approach for the next many years to come***



Support for ARC-CE in WMS

- **Initiated in 2006 – stalled for 6-9 month**

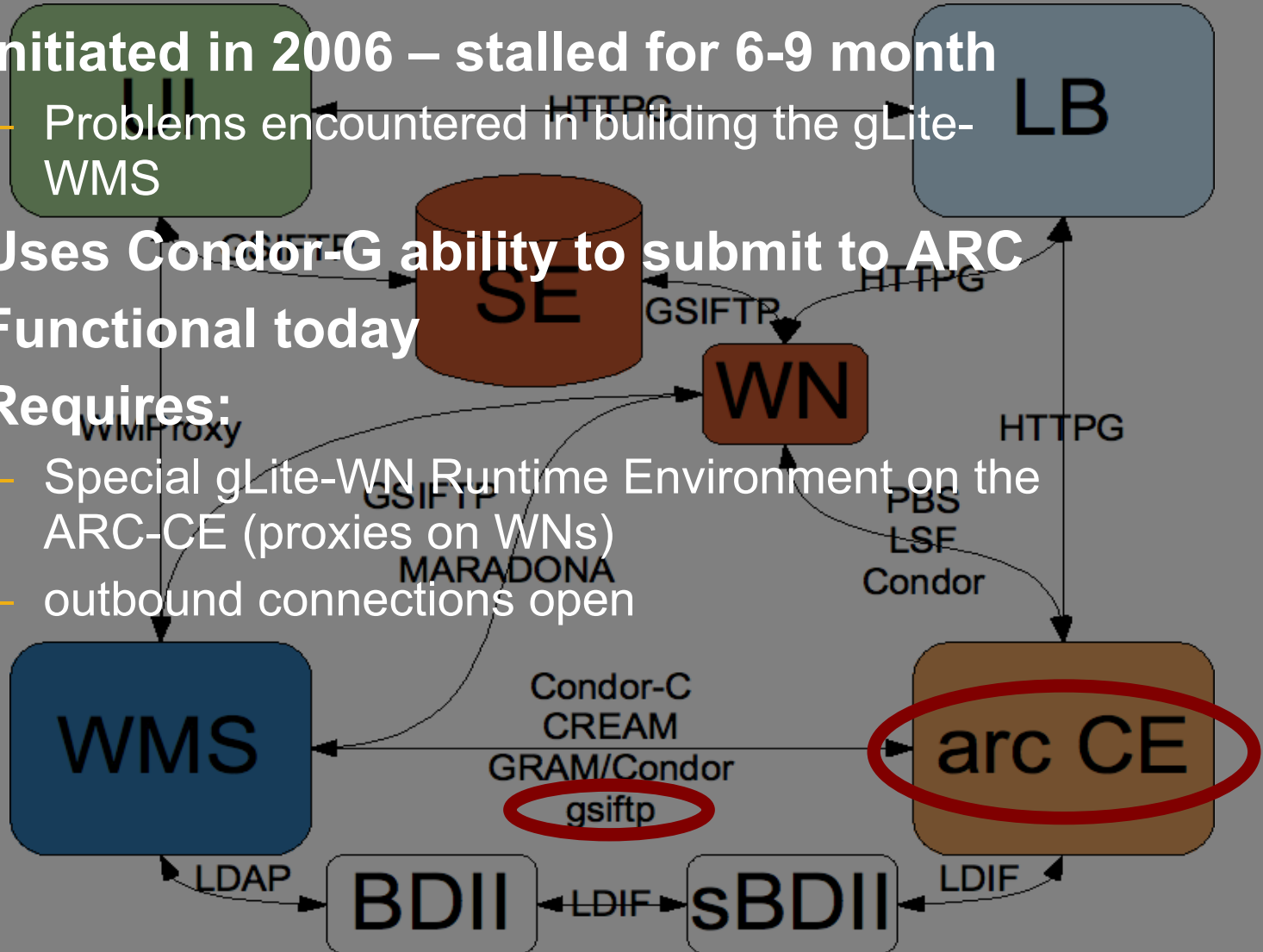
- Problems encountered in building the gLite-WMS

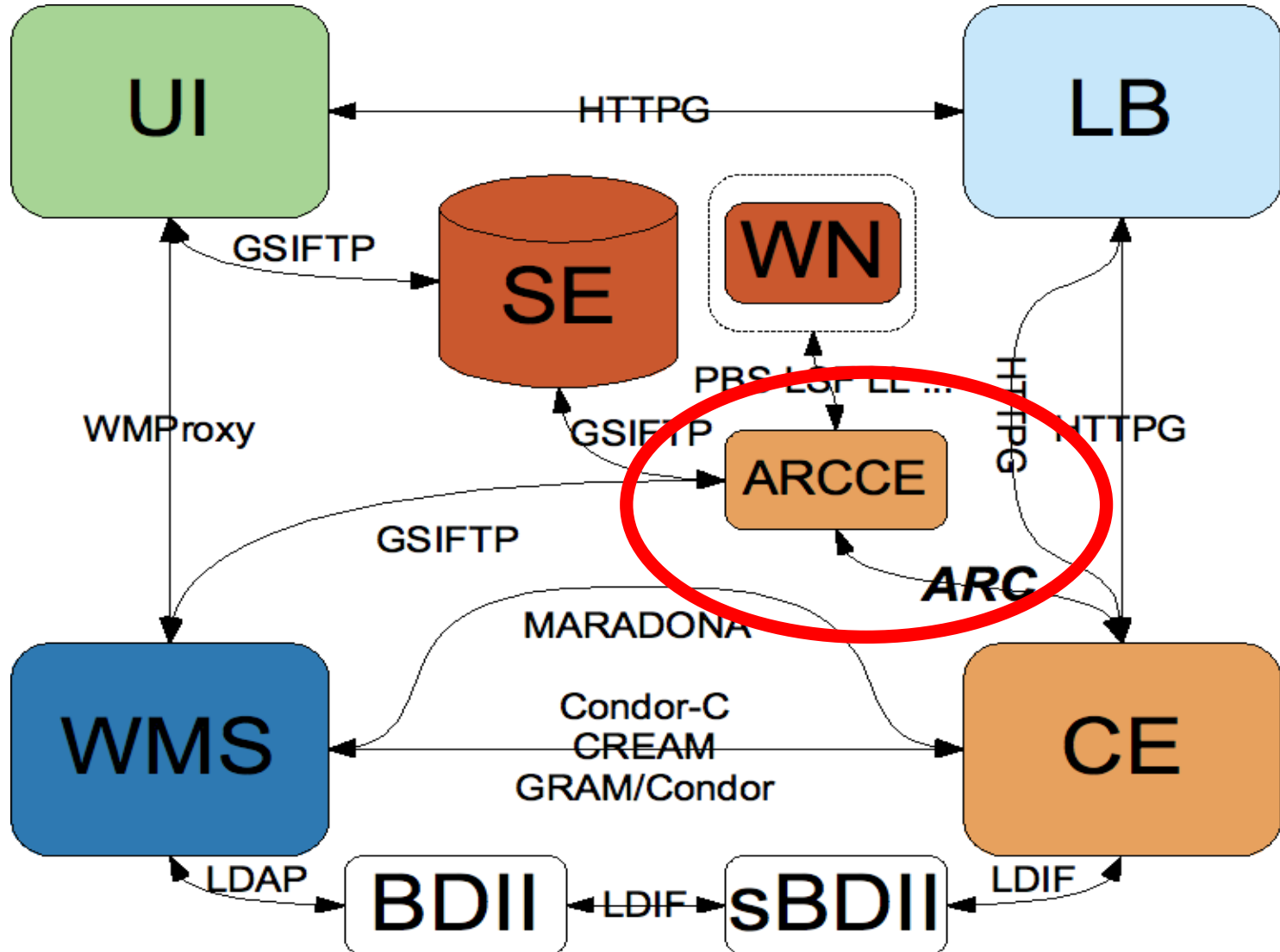
- **Uses Condor-G ability to submit to ARC**

- **Functional today**

- **Requires:**

- Special gLite-WN Runtime Environment on the ARC-CE (proxies on WNs)
- outbound connections open





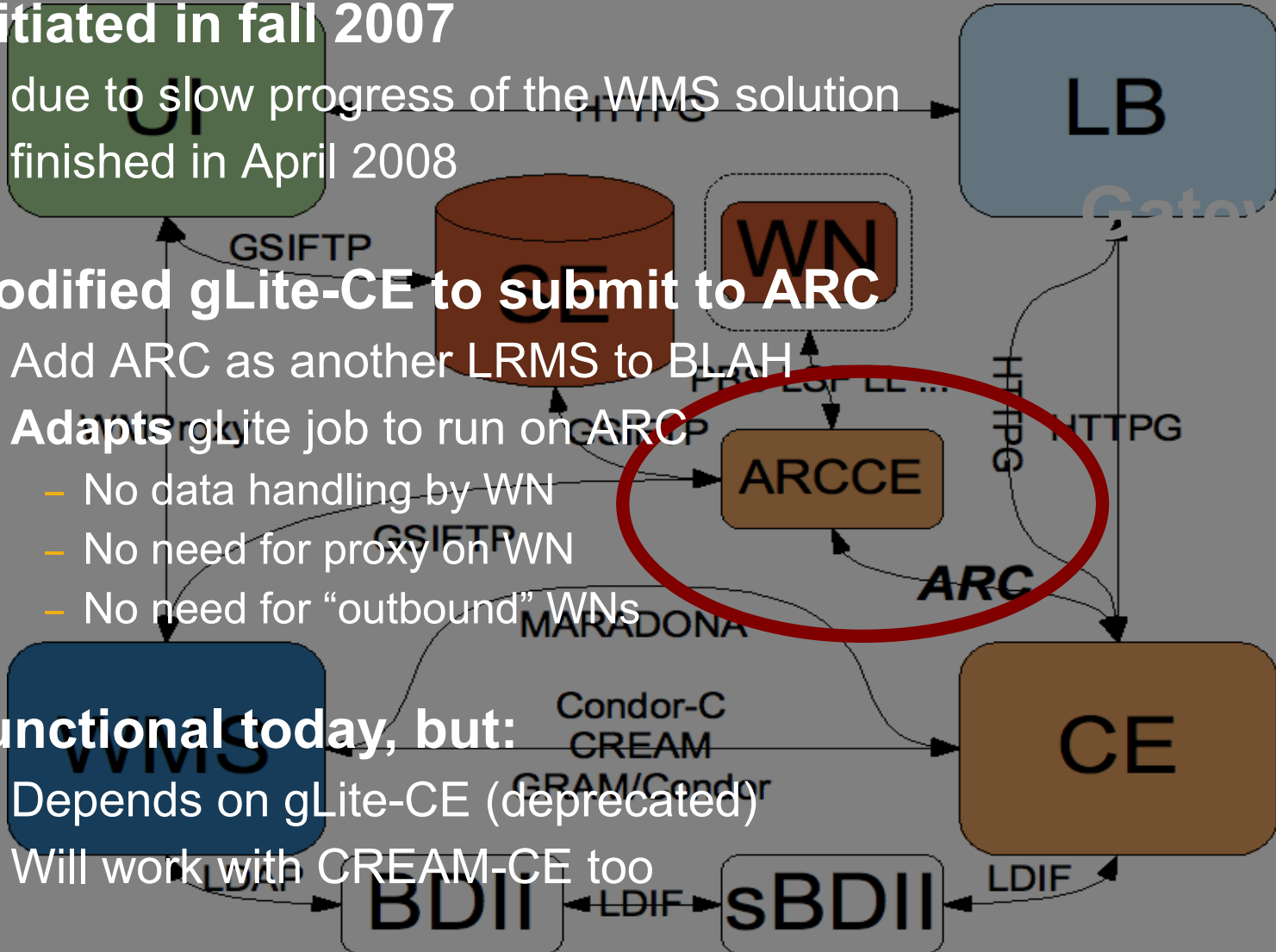
- **Initiated in fall 2007**
 - due to slow progress of the WMS solution
 - finished in April 2008

- **Modified gLite-CE to submit to ARC**

- Add ARC as another LRMS to BLAH
- **Adapts** glite job to run on ARC
 - No data handling by WN
 - No need for proxy on WN
 - No need for "outbound" WNs

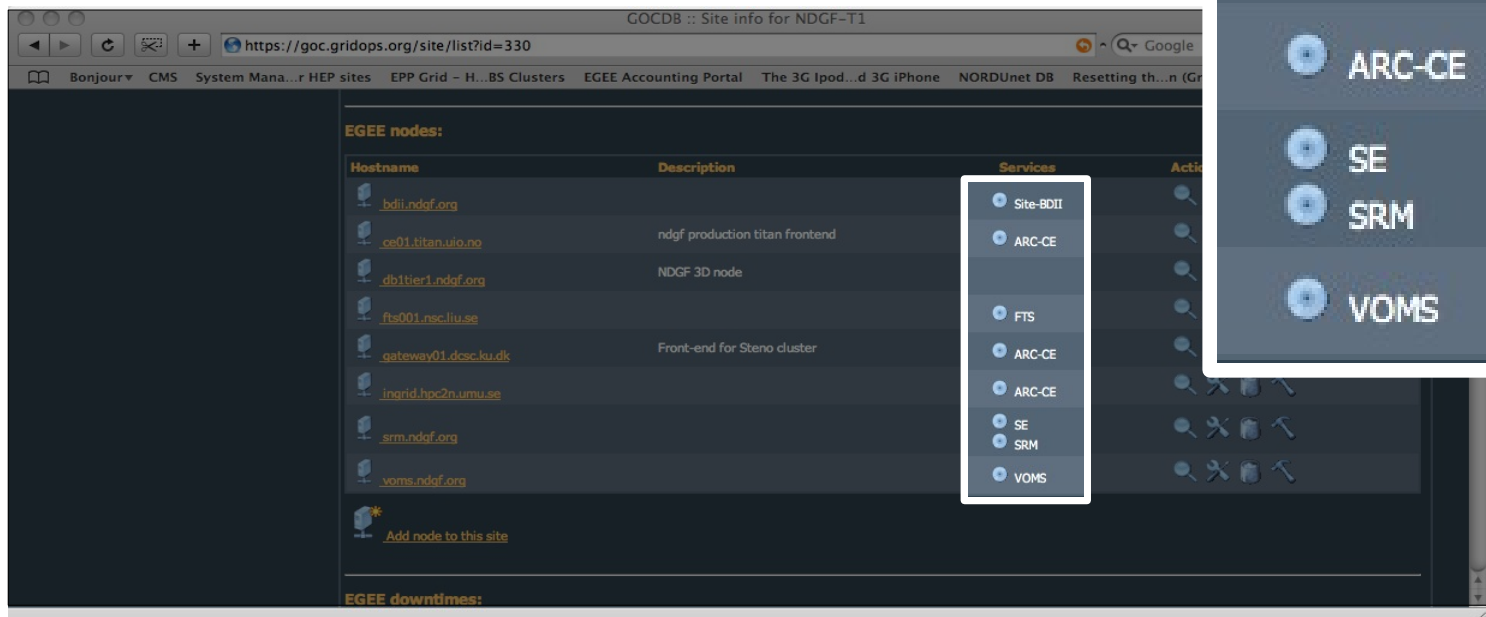
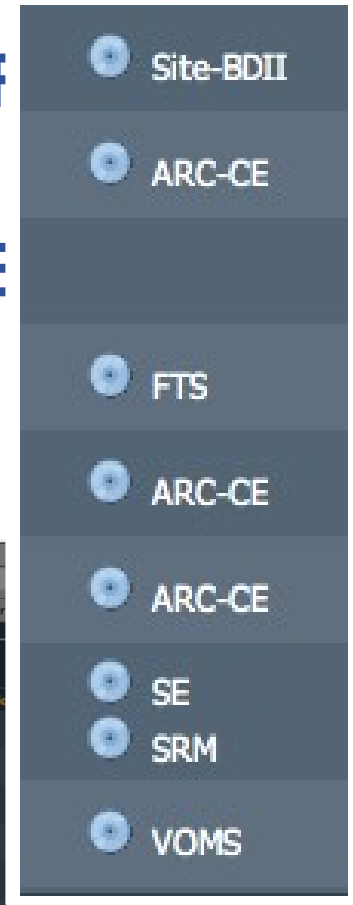
- **Functional today, but:**

- Depends on gLite-CE (deprecated)
- Will work with CREAM-CE too

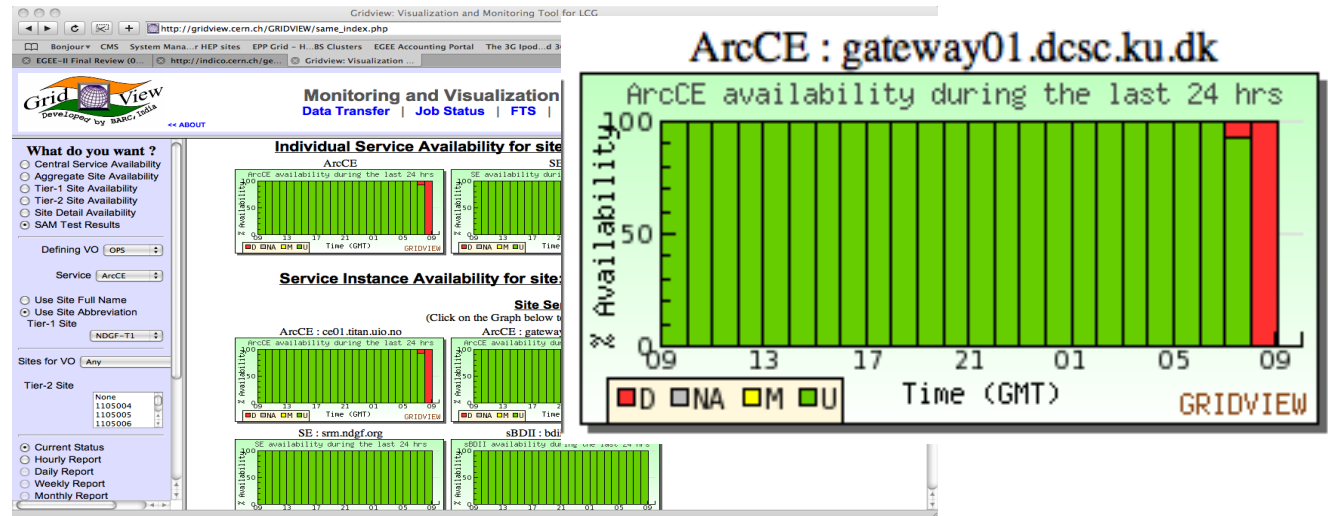


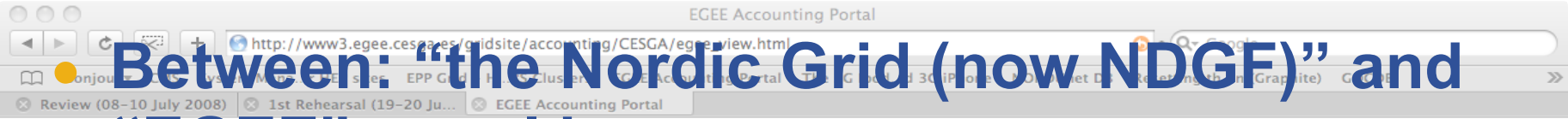
- **Between: “the Nordic Grid (now NDGF)” and “EGEE” - goal is:**
- **To integrate NDGF fully into the EGEE infrastructure**

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- Registered ARC-CEs in the GOCDB
- Enabled SAM tests for ARC-CEs





● Between: “the Nordic Grid (now NDGF)” and “EGEE” - goal is:

● To integrate NDGF fully into the EGEE infrastructure

Hierarchical	alice	atlas	biomed	cms	dteam	esr	geant4	lhcb	ops	Other VO's	Total	%
BEgrid-KULeuven	0	0	0	0	11	0	0	0	14	9,127	9,152	0.09%
BEgrid-UGent	0	0	0	29	14	0	0	0	12	254,267	254,322	2.54%
BEgrid-UB-VL	0	0	0	40	17	28	0	0	37	42,216	445,428	4.45%
BG-Grid-CL	0	0	0	24	83	2	0	0	1	0	241,886	2.41%
CSC	0	0	0	0	63	224	0	0	73	8,415	8,775	0.09%
EENet	0	0	0	6,198	97	0	0	2,025	110	19,828	28,258	0.28%
HP-Grid	875	0	0	0	0	0	0	17,004	158	0	89,942	0.90%
IM-Grid	0	0	0	0	0	0	0	0	12	5,183	10,050	0.10%
IMCSUL-INF	0	0	0	1,508	5	0	0	0	22	25,335	26,870	0.27%
ITPA-LCG2	0	0	0	31	69	0	0	4,437	59	20,561	25,157	0.25%
KTU-Grid	0	0	0	0	0	0	0	0	63	3,856	3,948	0.04%
KT-FELIX	0	0	0	33	3	0	0	48	127	25,111	25,524	0.25%
LSG-AMC	0	0	0	0	0	0	0	0	39	1,842	1,881	0.02%
LSG-AMS	0	0	0	0	0	0	0	0	47	179	226	0.00%
LSG-KUN	0	0	0	0	0	0	0	0	49	1,096	1,145	0.01%
LSG-NKI	0	0	0	0	0	0	0	0	38	319	357	0.00%
LSG-WUR	0	0	0	0	0	0	0	0	35	1,581	1,616	0.02%
NDGF-T1	1,230,314	2,618,708	0	0	0	0	0	0	7	0	3,849,029	38.43%
NIKHEF-ELPROD	460,091	887,648	135,539	46	116	7,601	472	887,788	0	662,880	3,042,181	30.37%
NSC-BLUESMOKE	0	2,240	0	0	10	0	0	0	17	0	2,267	0.02%
PDC	857	7,979	53,789	156	33	0	0	14,955	31	31,406	109,206	1.09%
RTUETF	0	0	0	136	0	0	0	48,607	51	30,972	79,766	0.80%
RUG-CIT	0	5,962	0	0	16	31,998	0	727	21	107,208	145,932	1.46%
SARA-MATRIX	23,438	44,951	126,114	179	2,370	1,827	49	20,834	40	235,607	455,409	4.55%
T2_Estonia	0	0	0	467,955	0	0	0	8,714	41	18,967	495,677	4.95%
VICTI-Grid	0	0	0	404	0	0	0	8,600	60	4,424	43,407	0.43%

● Registered ARC-CEs in the GOCDB

● Enabled SAM tests for ARC-CEs

● Enabled Accounting for NDGF

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Enabled SAM tests for ARC-CEs

Enabled Accounting for NDGF

The ARC-CE Based NDGF infrastructure is the biggest NE site and contributed (2007) with 4% of all EGEE Computation!

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LSG-KN	0	0	0	0	0	0	0	0	0	1,145	1,145	0.01%	
LSG-NK	0	0	0	0	0	0	0	0	0	357	357	0.00%	
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- **The ARC-CE is now fully compatible with the gLite suite**
- **Sites running the ARC-CE integrate seamlessly into the EGEE infrastructure**
- **All infrastructure components are there:**
 - WMS, GOCDB, SAM, APEL
- **NDGF participates in the EGEE Operation**

The ARC-CE is now fully compatible with the gLite tools

Sites running the ARC-CE integrate seamlessly into the EGEE infrastructure

All infrastructure components are there:

GOcdb, SAM, APEL

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The WMS solution was used in production for the CMS CCRC08 (CSA08) for Finnish ARC sites

sepele.csc.fi

