

ARCHERY

The new ARC index system

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Overview

- History
- Idea
- Specification
- Examples



With thanks to Dmytro Karpenko for a previous version of these slides



Pre-ARC6 resource indexing

- Index services (EGIIS), a built-in feature of ARC
- Requires installation and configuration of ARC (only specific packages)
- Bottom-to-top registration
 - The index owner needs to whitelist a resource
- Registration does not guarantee availability
 - The infosystem can register even if A-REX is down
- Not really used by the communities
 - Real grid users pretty much prefer to maintain own static lists of available endpoints



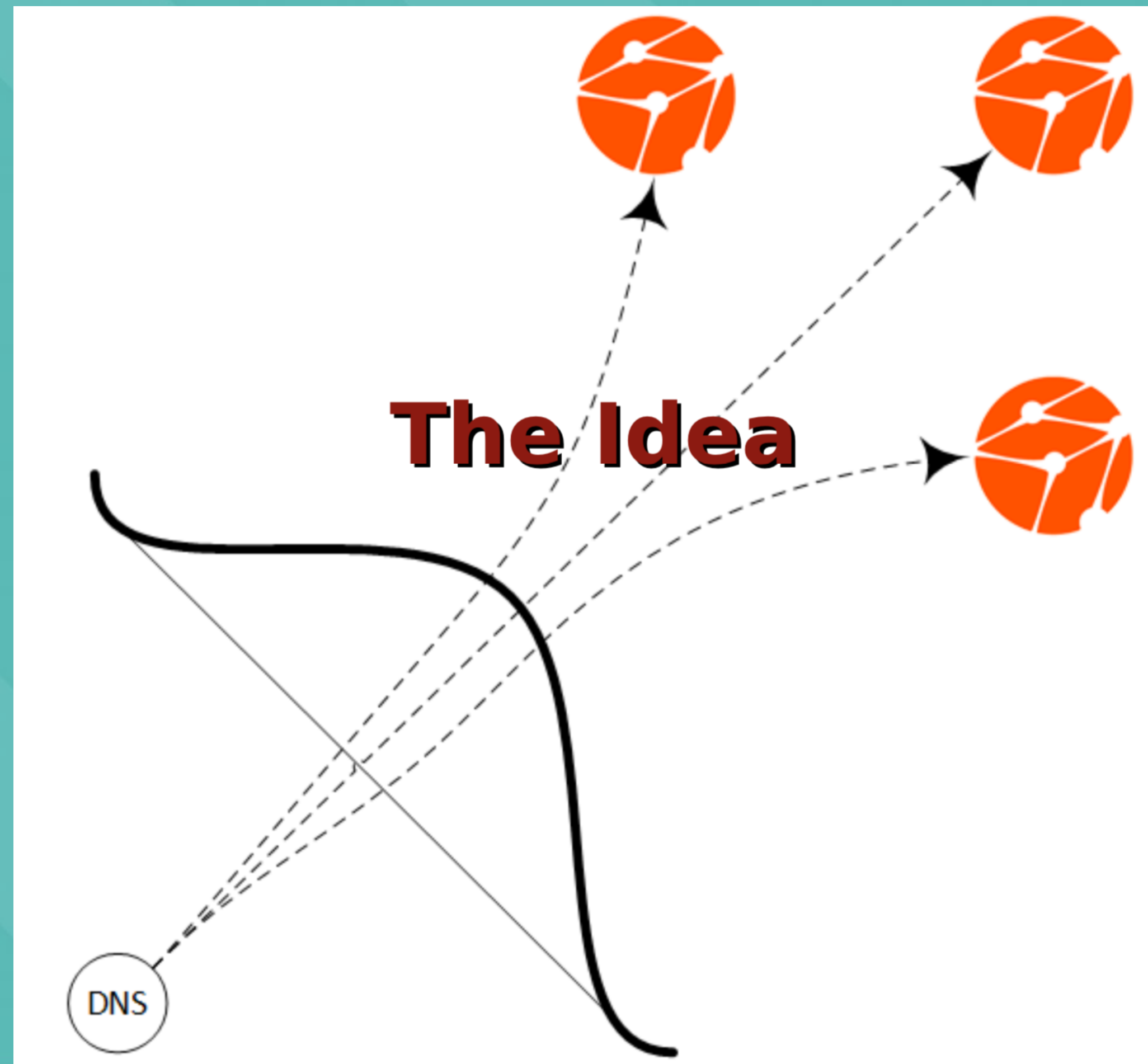
ARCHERY: The Idea

Let the communities have their static lists

...and provide them with a robust technology to distribute, cache, and access these lists...

Sounds like DNS?

Enter: ARC Hierarchical Endpoints Registry - ARCHERY



ARCHERY: The DNS Idea

- Create a DNS zone
- Insert TXT RRs into the zone
- Now the DNS will take the burden of delivering those RRs
 - Just query the DNS for TXT records to get available resources

```
arc@arc-ce $ host -t TXT 560de49781._archery.atlas.archery.ndgf.org
560de49781._archery.atlas.archery.ndgf.org descriptive text
    "u=gsiftp://ce03.grid.uio.no:2811/jobs t=org.nordugrid.gridftpjob"
560de49781._archery.atlas.archery.ndgf.org descriptive text
    "u=https://ce03.grid.uio.no:443/arex t=org.ogf.glue.emies.resourceinfo"
560de49781._archery.atlas.archery.ndgf.org descriptive text
    "u=https://ce03.grid.uio.no:443/arex t=org.ogf.glue.emies.activitymanagement"
...
```



ARCHERY: Specification

- _archery TXT RR as an entry point
- RR format for each endpoint is
 - u=<uri> t=<type> [t=<type>...] [s=<status>]
 - o=group [t=<group type>] [id=<group id>]
 - o=service t=<service type> id=<service id>
- Examples of endpoint types
 - org.nordugrid.Idapng
 - org.nordugrid.Idapglue2
 - org.ogf.glue.emies.resourceinfo
- Examples of endpoint registries types
 - archery.group
 - archery.service
- Links to the detailed docs and specs:
<http://www.nordugrid.org/documents/arc6/admins/archery>



Hierarchy: Ukraine example

```
$ORIGIN nordugrid.org.
```

```
_archery TXT "u=ua.archery.nordugrid.org t=archery.group"
```

```
$ORIGIN ua.archery.nordugrid.org.
```

```
_archery TXT "u=dns://304fb16a79._archery.ua.archery.nordugrid.org. t=archery.service"
```

```
_archery TXT "u=dns://66ae15cebe._archery.ua.archery.nordugrid.org. t=archery.service"
```

```
$ORIGIN _archery.ua.archery.nordugrid.org.
```

```
304fb16a79 TXT "u=ldap://felix.iap.sumy.org:2135/Mds-Vo-Name=local,o=grid t=org.nordugrid.ldapng"
```

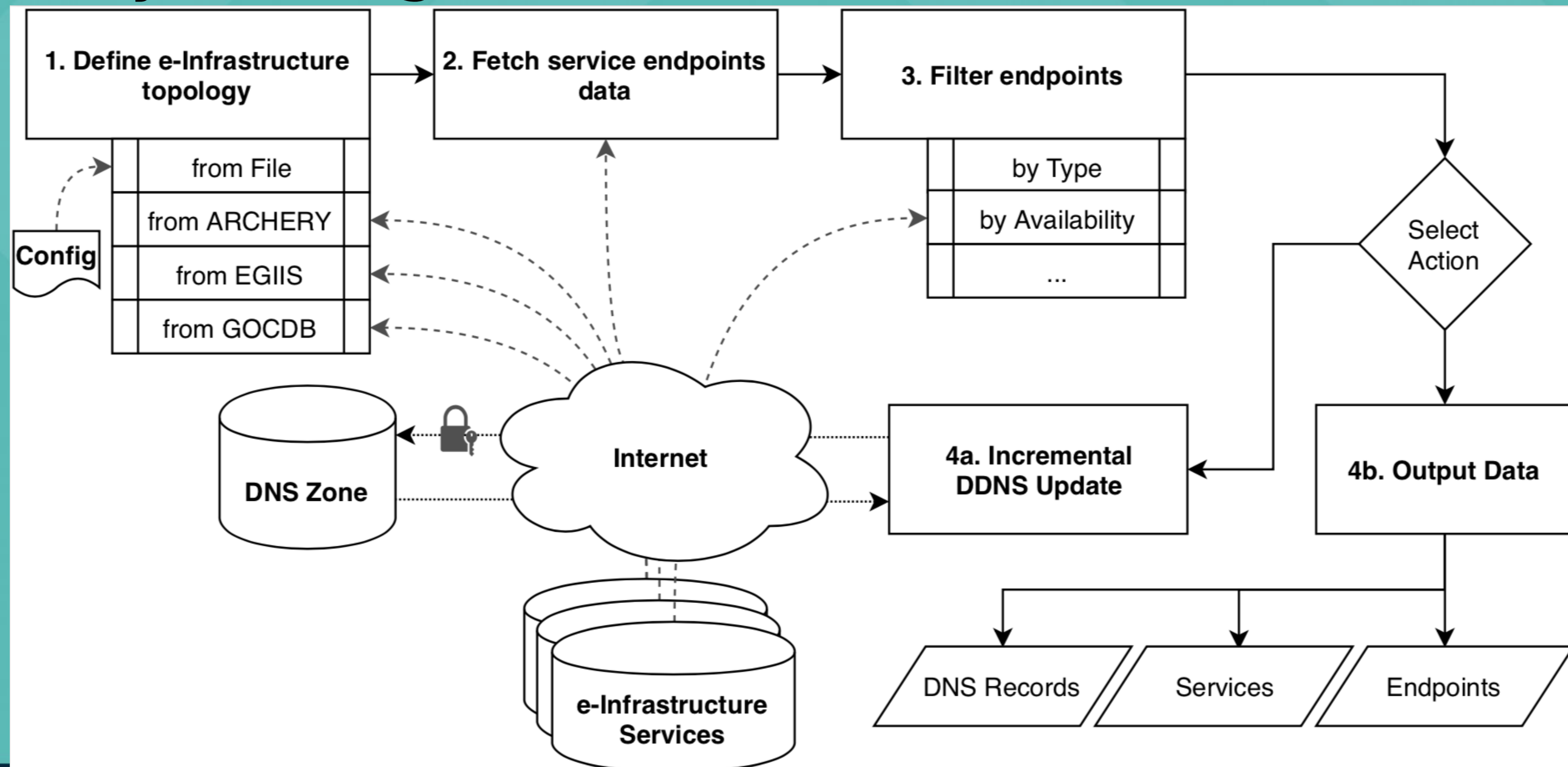
```
304fb16a79 TXT "u=gsiftp://felix.iap.sumy.org:2811/jobs t=org.nordugrid.gridftpjob"
```

```
66ae15cebe TXT "o=service t=org.nordugrid.arex id=arc.immsp.kiev.ua"
```



ARCHERY: so how do you index?

- Manual RR creation in the zone file
- archery-manage tool (much more recommended!)



Filter as you index

- archery-manage can be picky
 - portscan
 - drop endpoints that do not answer to queries to service ports
 - vo:<voname>[,<voname>...]
 - drop endpoints that do not support specified VOs
 - type:<endpoint type>[,<endpoint type>...]
 - drop endpoints that do not provide the specified service types (f.ex. Gridftp interface)
- For extra pickiness: combine the filters

```
[dmytrok@gridadm grid]$ archery-manage -f portscan -f  
vo:atlas,atlas.ops -s arcce-list:/tmp/archery.txt
```



atlas.archery.ndgf.org

- A real ARCHERY usecase: a CE-list for ATLAS, hosted by NDGF (maintains ndgf.org zone)

```
zone "atlas.archery.ndgf.org" IN {  
    type master;  
    file "/var/lib/bind/atlas.archery.ndgf.org";  
    notify yes;  
    allow-update {  
        key archery_key;  
    };  
};
```



atlas.archery.ndgf.org

- Contains the hosts ATLAS wants to see indexed
 - <http://aipanda404.cern.ch/data/releases/atlasregistrants.txt>
- A cron job dumps that list to the archery twice a day via Ansible

- **name:** download the list of ATLAS servers
local_action: get_url
url=<http://aipanda404.cern.ch/data/releases/atlasregistrants.txt>
dest=/tmp/archery.txt
force=yes
- **name:** update Archery registry on ndgf.org
local_action: "shell /usr/sbin/archery-manage -s arcce-list:/tmp/archery.txt -f portscan --ddns-update -domain atlas.archery.ndgf.org --ddns-master-ip <our_shy_nameservers_ip> --ddns-tsig-keyfile /etc/arc/archery-manage.key"



atlas.archery.ndgf.org results

- Due to portscan and the need for the CEs to register themselves, the ARC5 and archery ATLAS indices differ.
- Please note, that the hashes in the text to the left are replaced with real domain names to make comparison possible.
- Data from March 2019

```
dmytrok@ladon:~$ host -t TXT
_archery.atlas.archery.ndgf.org
u=dns://abisko-ce.hpc2n.umu.se
    # Don't register to arcgiis.grid.uio.no
u=dns://arc-1-kit.gridka.de
    # Present only in Archery
u=dns://arc-2-kit.gridka.de
u=dns://arc-3-kit.gridka.de
u=dns://arc-ce-condor.pleiades.uni-wuppertal.de
u=dns://arc-ce.pleiades.uni-wuppertal.de
u=dns://arc-ce01.gridpp.rl.ac.uk
u=dns://arc-ce02.gridpp.rl.ac.uk
u=dns://arc-fdr2.grid.sinica.edu.tw
u=dns://arc-grid.uaic.ro
u=dns://arc-htc.nipne.ro
u=dns://arc-it4i.farm.particle.cz
u=dns://arc-node.itim-cj.ro
```

```
dmytrok@ladon:~$ ldapsearch -xLLL -h
arcgiis.grid.uio.no -p 2135 -b "mds-
vo-name=Atlas,o=grid" -s base | grep
nordugrid-cluster-name | sort
arc-ce-condor.pleiades.uni-wuppertal.de
arc-ce.pleiades.uni-wuppertal.de
arc-ce01.gridpp.rl.ac.uk
arc-ce02.gridpp.rl.ac.uk
arc01.hpc.ku.dk
    # Had problems during portscan
arc01.lcg.cscs.ch
    # Present only in arcgiis's index
arc02.lcg.cscs.ch
arc03.lcg.cscs.ch
arc04.lcg.cscs.ch
arc07.lcg.cscs.ch
aurora-grid.lunarc.lu.se
c2pandata2.lrz.de
```

atlas.archery.ndgf.org in use

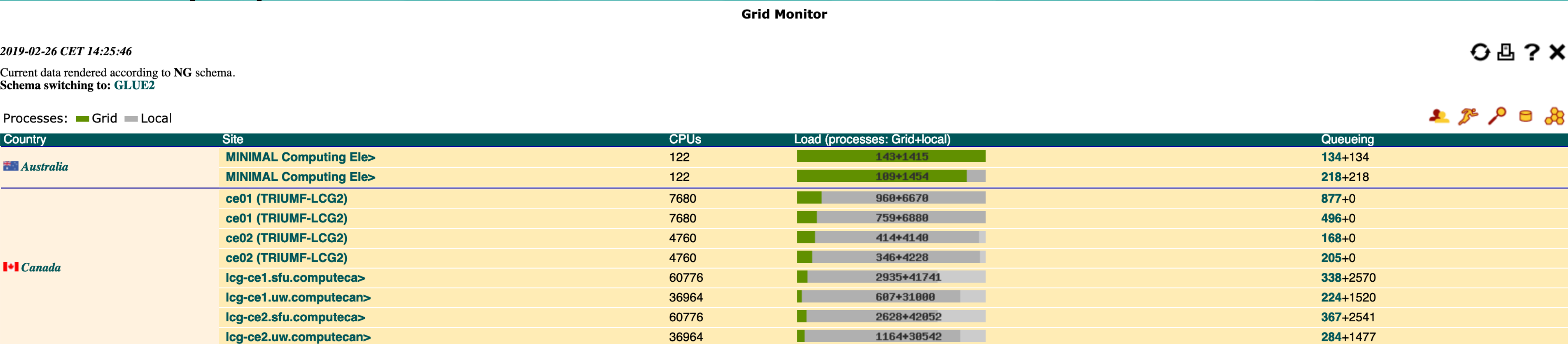
- To submit a job, resource discovery for brokering

```
[dmytrok@gridadm grid]$ arclsub -g atlas.archery.ndgf.org xrsl
```

Job submitted with jobid:

<gsiftp://arc03.lcg.cscs.ch:2811/jobs/cCFMDm3voctndvtlepYPV1GmABFKDmABFKDmAvfKDmABFKDmRFFdrn>

- To populate the monitor



archery-manage as client

```
[user ~]$ archery-manage -s archery:moldyngrid.org -o arc-CEs
```

```
golowood.mao.kiev.ua
```

```
arc.imbg.org.ua
```

```
arc.univ.kiev.ua
```

```
uagrid.org.ua
```

```
grid.isma.kharkov.ua
```

```
[user ~]$ archery-manage -s archery:egi.grid.org.ua -o services
```

```
glue:sehn02.atlas.ualberta.ca/data : org.dcache.storage
```

```
glue:lcg-se1.sfu.computecanada.ca/data : org.dcache.storage
```

```
urn:ogf:ComputingService:lcg-ce1.sfu.computecanada.ca:arex : org.nordugrid.arex
```

```
urn:ogf:ComputingService:lcg-ce2.sfu.computecanada.ca:arex : org.nordugrid.arex
```

```
neutsrv1.triumf.ca_bdii-site_497425383 : bdii_site
```

```
[...]
```

```
[user ~]$ archery-manage -s archery:nordugrid.org -o endpoints --json | jq .
```

```
[
```

```
{
```

```
  "t": "org.nordugrid.gridftpjob",
```

```
  "u": "gsiftp://deckard.dcsc.ku.dk:2811/jobs",
```

```
  "rr_data": "u=gsiftp://deckard.dcsc.ku.dk:2811/jobs t=org.nordugrid.gridftpjob"
```

```
},
```

```
[...]
```

ARCHERY: Country indexes

- Nordugrid has had a set of country-level indexes
- Migrating these to ARCHERY instead of GIIS, WIP:

```
dig -t TXT _archery.nordugrid.org
[...]
_archery.nordugrid.org. 1617IN TXT "u=ee.archery.nordugrid.org t=archery.group"
_archery.nordugrid.org. 1617IN TXT "u=dk.archery.nordugrid.org t=archery.group"
_archery.nordugrid.org. 1617IN TXT "u=si.archery.nordugrid.org t=archery.group"
_archery.nordugrid.org. 1617IN TXT "u=atlas.archery.ndgf.org t=archery.group"
_archery.nordugrid.org. 1617IN TXT "u=hu.archery.nordugrid.org t=archery.group"
_archery.nordugrid.org. 1617IN TXT "u=fi.archery.nordugrid.org t=archery.group"
_archery.nordugrid.org. 1617IN TXT "u=uk.archery.nordugrid.org t=archery.group"
_archery.nordugrid.org. 1617IN TXT "u=it.archery.nordugrid.org t=archery.group"
_archery.nordugrid.org. 1617IN TXT "u=sk.archery.nordugrid.org t=archery.group"
_archery.nordugrid.org. 1617IN TXT "u=ua.archery.nordugrid.org t=archery.group"
_archery.nordugrid.org. 1617IN TXT "u=ch.archery.nordugrid.org t=archery.group"
_archery.nordugrid.org. 1617IN TXT "u=se.archery.nordugrid.org t=archery.group"
_archery.nordugrid.org. 1617IN TXT "u=pt.archery.nordugrid.org t=archery.group"
_archery.nordugrid.org. 1617IN TXT "u=no.archery.nordugrid.org t=archery.group"
[...]
```



Further reading

- The Manual

- <http://www.nordugrid.org/documents/arc6/admins/archery/index.html>

- The Monitor

- <http://www.nordugrid.org/monitor/atlas/>





Questions?