NG2018 technical meeting notes

*June 2018, Garching*

# Discussion blocks

## Rolling out ARC 6

### Functionalities to test

Content of the first ARC 6 test release (going beyond hello-world scenario) - minimal functionality to be tested, e.g. job management, interface etc. that is tested. Only server-side, client is less important.

To be tested (external services are sometimes required, e.g. storage):

* Job management: GridFTP, EMI-ES, REST and local submission interfaces
* Authorisation: gridmapfile, gridmapless (VOMS attributes only), authrgroups (incl. on queue level), nordugridmap fetching from VOMS
* Data management: cache, data staging (in, out - gridftp, xroot, https)
* LRMS: SLURM (python back-end), fork, HTCondor - all with new configuration
* RTEs: ENV/PROXY
* Infosys: nordugrid-arc, GLUE2; VO info
* Startup scripts: a-rex, gridftp, infosys, data delivery service (metapackages)
* JURA: APEL, SGAS; manual re-publishing
* Server logfiles
* Validator
* Clients: compatibility with ARC5 client, CondorG client, DIRAC client, and eventually with ARC6 client; interpretation of XRSL attributes, esp. units of memory, disk, time etc

Singularity RTE, container support in HTCondor will be tested later

For the future: consider using targets in system.d for startup

A wish: provide “service arc-ce start/stop” ; can be done via arcctl

### Priorities

What are the "standard" or top-priority interfaces of ARC 6, e.g. can it be the REST interface (or EMI-ES), + XRSL + whatever info schema? What are the top priority LRMS systems, build platforms, etc? The Golden Setup.

For a WLCG site priorities are defined by VOs and especially EGI. Specifically:

* *Nordic ARC-CE for WLCG (served by aCT): EMI-ES (but Petter will have to fix monitoring scripts), eventually REST; but for EGI GLUE2 LDAP is also needed. So there’s little use of EMI-ES and this use case is all but obsolete*
* Non-nordic ARC-CE for WLCG (not served by aCT): GridFTP (HTCondor does not work with anything else yet) with nordugrid-arc LDAP and GLUE2; SLURM and HTCondor. CentOS7
	+ Recommendations for:
	+ **Sessiondir**: crossmounted on WNs and frontend. Min 200GB and 2GB for each job, job should run on local disk preferrably.
	+ Cache: 100-200TB for ATLAS
	+ More references from <https://wiki.neic.no/wiki/Running_ARC_CEs_for_NeIC_Tier_1>
* Non-WLCG ARC-CE: EMI-ES (eventually REST), SLURM; CentOS7

### Testing

ARC 6 testing, test plans, test infrastructure, test reports.

Balazs reports outcome of Ljubliana:

#### A list of well-defined test cases

The components to be tested are those listed in “Functionalities to test”

Maiken document: <https://docs.google.com/spreadsheets/d/1BQM2u-C95tDkXhiNEGFoWDcH51nzEel3Lp-lX4lUMPI/edit#gid=0>

Step 1: Balazs requires a “test case template” (see Action Points)

Step 2: developers come with test cases (see Action Points)

Type of tests:

CI on gitlab, manual tests

Level 0: Gitlab CI autodeployed tests

Level 1: Openstack persistent test machines w/log-in access to developers and changeable set-up arc.conf

Level 2: testing on production sites

#### A platform to run the tests

Current (Maiken): 5 machines to run on different distributions in gitlab CI

Best would be to have VMs that testers/developer can fully access, but Maiken is not sure that we can all access these machines as they are part of Oslo infrastructure.

Conclusion: Maiken says it is possible to give her the specs one wants to test and then she can give you access to the machine.

The test system will have a debugging environment which the developer can use to check what is going on

#### Test reports

Manual table will be used for tests runned manually

No formal report will be written

### SW Repositories

NG repo: separate repos for 5 and 6

Distros: new distros will get arc6, but not old ones

Conclusion: main place or ARC is in NG repos, if any change to get into the distro repos we will take it.

### Documentation

* ARC6 arc.conf.reference in the sysadmin guide must be rewritten
* <http://www.nordugrid.org/documents/arc-server-install.html> must be updated, likely be moved to gitlab
* Technical documents for new ARC6 stuff: ARCHERY, event-driven, config parser, Maiken-plugin, RTE
* Sysadmin guide: let’s write the above documents and then take decision what to do with the document.

## Code development ecosystem

### Gitlab and other stuff from Maiken

See presentation from Maiken

* Automatic port of changes from master to next-major is in an experimental phase, it might change in the future
* David: is it possible to change the form to make it easy to pick the labels?
* Aleksandr: is it possible to cleanup some of the labels so that we have less clutter in the labels list?
* Labels that are not in the list on gitlab should be communicated to Maiken and not entered manually before discussing with her
* dev-ARC6 not needed, what is needed is on-request per-feature branches. Aleksander suggests that the developers can create those directly.

### Bugzilla vs gitlab issues

* For the moment we will use bugzilla for the main bugreporting and tracking tool. Issues will be used mostly for git-related issues. We delay the decision to use exclusively one or the other when gitlab will be better developed.
* Bugzilla ticket for arc6: Bug applies to git with target arc6.0, bugzilla form should contain git hashes

### Status of automatic build and testing

* Do a strict comparison with the former build system to understand how different Maiken build environment and Anders build environment. The question is how “clean” is the system where git builds compared to anders’ mock-based system. We keep both because they test different thing. Mainken one is based on a docker image with selected packages.
* Could it be possible to limit the CI builds not to start to each change?
* CI seems good for testing purposes. We should try to define tests using the CI.

### Community, training and outreach

#### Contribute to ARC

* We must write how to contribute to arc as an external
* Github mirror if gitlab

#### Communication channels

* Stay with the current skype chat

#### ISCG WS March2019

Mattias W.: demand for more ARC workshops in Asia. At least 3 ppl needed. Install arc hands-on. Some other people that can give talks and describe experience

Conference in Taiwan end of March 31/March -> 1 Apr

Who goes?

#### ARC developers days for sysadmins

Retreat coupled with sysadmin outreach.

* First part coding
* Second part workshop with sysadmins hands-on
* Location:
* Week: End of september or October 8-12/Oct is Epix that will have most WLCG sysadmin. Will send out a doodle for this.

## Post ARC-6 Part 1

### Data management in ARC - Discussion

Presentation by Vincent

ARC-cache

Suggestion last ng conference: lightweight python clients for the arc data delivery service

Prototype now in place

arex just with just data delivery service

Have now: tool that can communicate directly with the data delivery service (DDS)

DDS component can be packaged outside of ARC

Current arc-cache model: squid model

Current cache tied to the shared fs …

Rucio+aCT

Useful for small vo’s …

Decouple job from data management …

Testing successful?

If you want no storage element, can have ARC data service frontend

Lightweight storage element combined with a transfer service

### REST interface for aCT

Jakob presenting

Client engine exposes API modules, using modules to implement different user interfaces. Last time: CI interface. Now added REST interface.

Send proxy over https (no delegation)

Suggestion: use token instead. Could be very good for future, requires more development, and better support for ARC if several authentication methods are to be added.

Delegation is the part that should maybe be incorporated if to be done “properly”.

## ARC 6 content

### Components to remove

### Defaults, mandatory blocks etc

### ARC 6 and ARC 5 living together

At the moment not supported from packaging point of view

Not needed either since arc6 client should work with arc5-6 server and the other way around

Thread data staging problem: Aleksandr has added commit to svn - Want to roll out test on ARC 5 first - Jens/Oslo

### Backward incompatibility: ARC 5,6 client vs. ARC 5,6 servers

Aleksandr: worried about infosys

Florido: schemas have not changed, information published has not changed, not different than 5.4.2. How API handles things… main changes in VO publication

Data management: interface wise nothing changed - OK

Job management: interfaces standarized, nothing changed, could be bugs on emi-es arc5 client - OK

Job description: walltime fix in job description conversion (?) - could be a problem - must check

Infosys - all OK except: Request to be able to see what VO is running, which jobs for each VO, submit jobs accordingly - only in ARC 6 client

Arc 5 client can not find arc 6 jobs and the other way around?

Syncing gives option to convert database

With upgrade you have to run arcsync -

After update, warning database format is different, please do arcsync

Conclusion: all OK

### ARCHERY “demo”/overview

Archery solves inaccessibility problem

Querying ldap, based on glue2

Each country has static list, push list into appropriate zone

Documentation ready for hosting ARCHERY

Roll out in Nordugrid, then try to push/replace BDII ...?

### Validator

Zero-conf Some blocks should not be required now: common, cluster

Ship developer arc.conf with packaging

If no mapping,

If fork is running as root, run as nobody as default?

If you do not expose your frontend, it is ok to have fork

If actual arc.conf lost, problem if default arc.conf is used and run by root

Something meant for production should not allow this.

Production CE -

Suggestion: separate step to place zero-conf make install arc-conf or somthing

### arc.conf

* arc.conf got somehow broken, Balazs will fix it next Friday
* Some new additions are expected in [cluster] and [queue] blocks
* *mandatory* concept will also change

### Configuration parser

See README in the repository for documented features. Its purpose is to get variables for the startup scripts; set up and export environment variables that are used by LRMS; feed JSON data to the infosys; providing information to arcctl.

Python backend for Slurm uses its own way for parsing the config, at some point we should make it use the config parser, as all others components do.

There is still much to be done.

### Profiles

At the moment only the data delivery service actually uses the profile. Alexandr suggests removing A-REX from the generic profile, because it uses its own way to get the configuration.

It is decided to remove A-REX from the generic profile.

### Configuration blocks and dependencies

Blocks are capturing relevant variables for the service in one place. Also if the block/subblock is defined, it turns on the corresponding service.

The question is how to handle the dependencies. Is it enough to only define a subblock, and not the parent block?

Arc.conf reference clearly states which blocks need to be present in the file to launch ARC. The production configuration will need all parent blocks anyway.

The final decision is that the parent blocks are mandatory before you define the subblock.

The further discussion was about which blocks are mandatory to have in arc.conf for the zero-configuration, and which are optional.

There were long debates about *data-stating* subblock. It’s not mandatory to have it, and we tried to agree on where to reject the job that requires data-staging. Should it be done by the client, or by the server? Alexandr’s point is that the infosys should not advertise the presence of the data-staging enabled, in other words, the job should be rejected on the server, when it comes and it becomes clear there is no data staging.

*[cluster]* block is confusing, since much of it is used by infosys to present information, so probably it’s better to have *[infosys/cluster]* block to clearly show the hierarchy. But before we do it, it has to be verified, that lrms does not use this block to submit jobs (it did before, but it has been claimed lrms is not using it any more).

We have to introduce *[queues]* (or *[queue]*, or *[queue/common]*) block that summarizes information relevant to all queues used by LRMS.

*[infosys/bdii], [infosys/ldap], [infosys/nordugrid]* are mandatory subblocks. *[infosys]* block is (mostly) empty. Might consider to use it for parameters that should go into *[infosys/cluster].*

arex ‘s subblocks introduce lots of dependencies, because enabling an interface in A-REX implicitly enables the corresponding infosys subblocks, with needed schemas and such. Enabling emies interface in A-REX needs *[cluster]* and *[queue]* blocks and also *[glue2]* subblock of the infosys. We have to remove implicit dependencies like those. If there are some needed blocks/subblocks which are not defined -- stop and don’t launch, don’t assume hidden defaults.

### Zero-conf

Most basic config for production CE. Sysadmin installs arc then runs arcctl deploy-config to set up configuration. Can set up temp CA and hostcert if one doesn’t already exist. Requires ansible.

Not really zero-conf but post-install configuration tool or “wizard”. Should install/configure everything needed for a production site like standard CA certs.

Ansible dependency - no agreement on whether this is good, but we finish the current version in ansible and see how it works.

### Management script from Andrii (**arcctl**)

Handling of the RTEs and stuff. Major idea is to eliminate the sharing of the scripts on the working nodes. Now in ARC6 we have one system-defined RTE directory, containing the shipped RTEs like **PROXY** and **RTE**. One can also define a user RTE dir(s). If an RTE is used, it is copied directly into the job script, no need to mount the RTE dir on the working nodes any more.

RTEs can be now enabled/disabled using **arcctl**. Also they can be made default (execute it for all jobs). Enabling/disabling is basically just symlinking to the control dir.

The demo or **arcctl** has been shown. It can manage RTEs and jobs. For jobs it’s basically the wrapper for **gm-jobs**.

The script can possibly be used for on-the-fly environment configuration for the jobs. F.ex. some job can run it to enable RTEs it needs, and disable RTEs after it is done. Possible use case: different versions of **ENV/PROXY** on the site, the job enables the version that best suits it needs (like the one only copying proxy itself, and not certs).

### Configuration example for ARC 6

Andrii showed the configuration file they use at KNU for ARC 6. Concerns were expressed about the case when gridmap file is missing. Then it’s substituted by the default, so extra care has to be taken on what we put in the default grid mapfile.

### Event driven job engine: demo by Aleksandr

30 seconds from the job is submitted until it’s finished. Much less delays in communicating and querying job status. It’s an integral part of ARC6 now, no way back to the old mechanism. The engine also aims to eliminate stuck jobs. Every job is guaranteed to have been attended to at least once during 10 minutes.

### REST interface

Simpel GET/PUT interface. Not based on any framework. Aleksandr tries to keep it compatible with browsers or other web tools like wget, so those can be used to interact with it. There is some docs on it, so everybody interested can explore.

### Runtime dependencies

Specified in a spec file. It’s ok if several packages list the same software, if each needs it. The current file was scrolled on-screen to spot any problems or strangely-looking things. Descriptions in the file is just text, one can write anything in it.

### Meta-packages

Which meta-packages we should have to simplify installation of needed services. Like **yum install arc-ce**. Mattias will create some meta-packages next week.

### Cleanup

Maiken and Balasz will review the packages and ask the authors if they have doubts the package still is needed.

### Next NorduGrid conference

Lund is investigating the possibility to host it next year.

# Action Points

1. Mattias removes EGIIS registration start-up script
2. Andrii writes arc-ce start/stop script
3. Balazs reviews NeIC recommendations
4. Balazs will come with a template for test cases by end of week 24
5. Developers write test cases by the end of week 25
6. Week 26 we review the outcome of the tests and see if it can be implemented on Oslo cloud.
7. Balazs updates configuration reference in sysadmin doc
8. Maiken/Oslo updates ARC6 installation (actually upgrade) instructions at <http://www.nordugrid.org/documents/arc-server-install.html>
9. Balazs will coordinate the technical documents for new ARC6 components
10. Maiken checks if forms for merge request can be changed to simplify label selection
	1. Check if is possible to remove some labels that devs will not use
	2. Remove the dev-arcN branch
11. Anders adds git hash to bugzilla to be able to reference
12. Balazs sends out doodle for ARC Devs & Admins meeting date/location
13. Mattias: bundle cache-clean script together with the data-delivery service package
14. Maiken: prepare branch in svn 5.4.2+data staging fix from Aleksandr for testing in Oslo and Triolith
15. Investigate walltime fix to make sure client 5/6 works with server ⅚
16. Maiken: make sure release notes inform that arc 5 client should work with arc 6 server and the other way around
17. Martin: After update, warning arc client database format is different, please do arcsync - should be implemented in client
18. Someone: write upgrade jobs. Also: suggestion that one should drain system before upgrading. Problematic, can not afford it.
	1. Aleksandr can make care that we have necessary conversion scripts for controldir etc
	2. Recommendation needs to be: set up test-ce to check your ARC 6 configuration etc
19. Some actions on the configuration and zero-conf front were mentioned but not recorded, like:
	1. Balazs fixes broken arc.conf
	2. Florido removes smartness from configparser - no implicit block definitions, all missing blocks must be reported as errors and infoproviders should fail.
	3. Maiken finalises ansible-based config wizard (which is not zero-conf…)
	4. …
20. Check that default path for condor and pbs exists - needs to be specified now in arc.conf to be picked up
21. Florido: update readme with build instructions for debian-based distros
22. Mattias will create some meta-packages next week
23. Lund investigates possibility to host NG2019