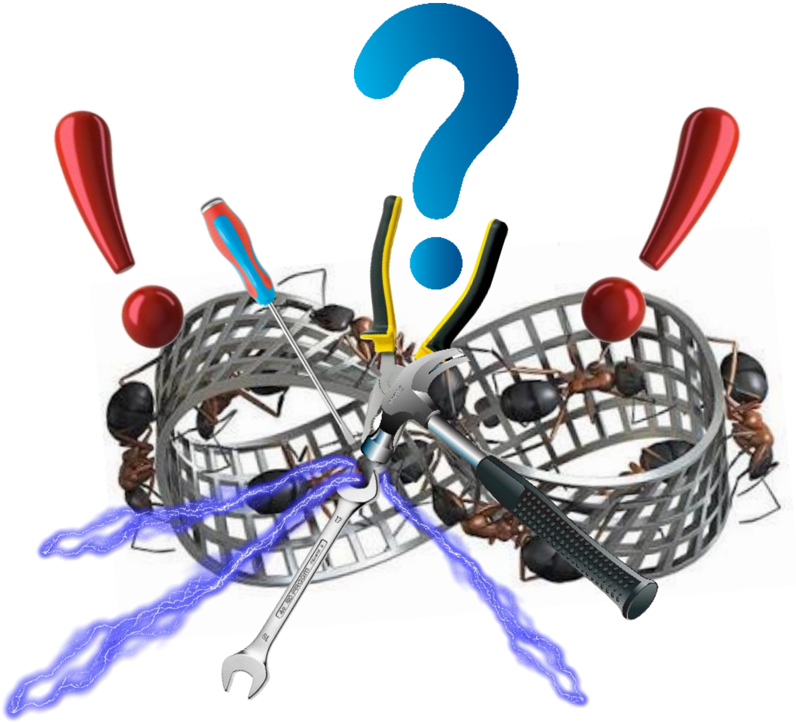
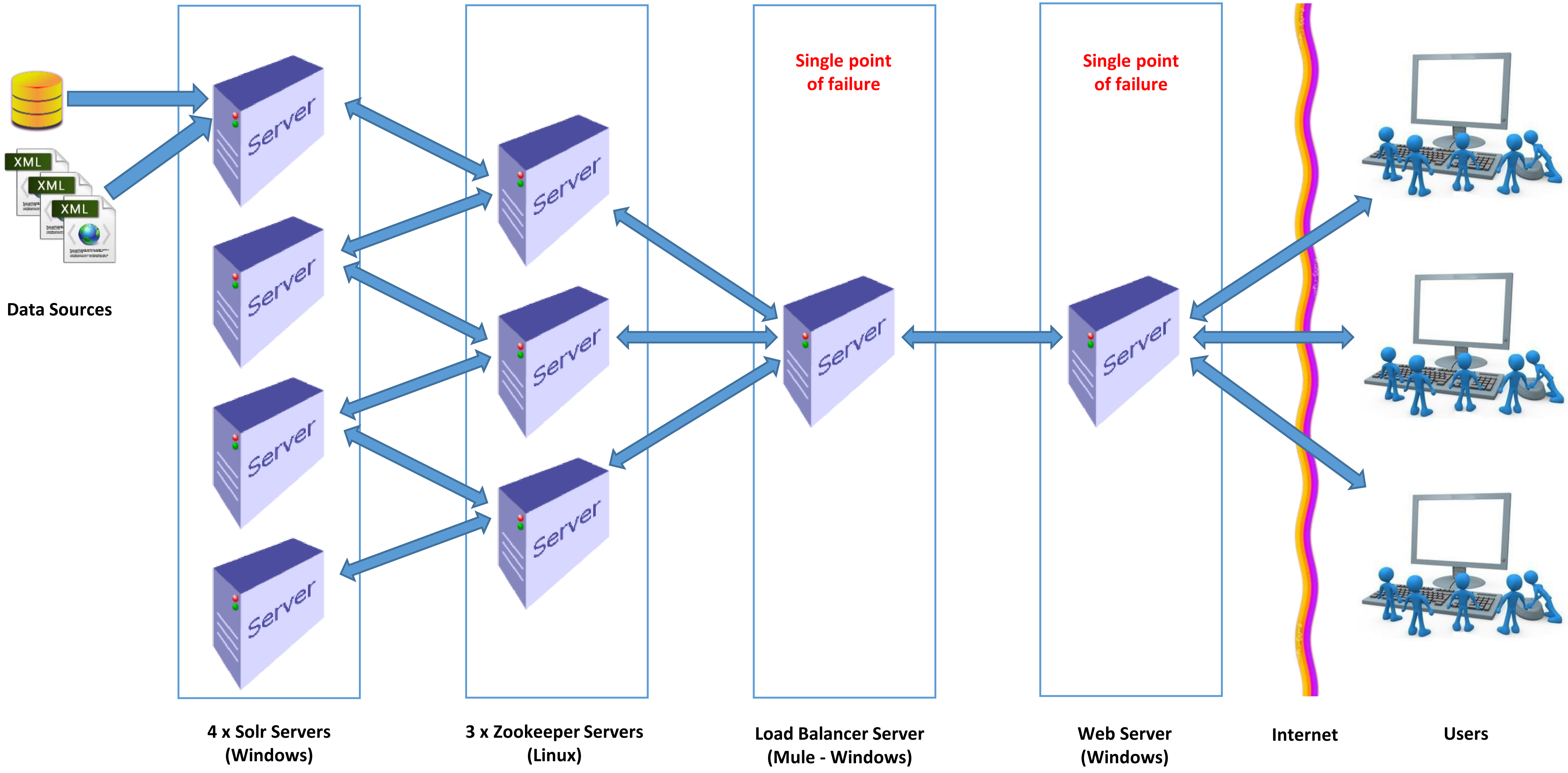
Solr Cloud vs Replication



vs

Solr Cloud implementation



Solr Cloud implementation

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- A Solr Cloud implementation would typically consist of (x) number of Solr servers, (x – 1) number of Zookeeper servers and a load balancer.
- **The Zookeepers deal with the replication of configuration files and indexes across the Solr server ensemble and report the server state to the load balancer.**

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    - **The Live environment had FOUR Solr servers, THREE Zookeepers and a ‘Mule’.**
    - **The Staging environment had TWO Solr servers, ONE Zookeeper and a ‘Mule’.**
    - **The Integration environment had ONE Solr server, NO Zookeeper and a ‘Mule’.**

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        - The Integration environment had ONE Solr server, NO Zookeeper and a ‘Mule’.
    - **The Live environment suffered from a maintenance issue (the ‘C-drive’ on the Master Solr server ran out of space). This brought the entire system down! We had to switch Live to the simplified Staging environment to provide service to our users.**

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  - **The Zookeeper notion was unreliable, with indexes getting out of synchronisation daily, hence the maintenance overhead was huge in order to simply try and provide a stable and reliable service for our users.**

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    - **Scalability**
      - **The ability to grow or shrink the number of servers in an environment should be made as simple as possible.**
      - **One should be able to easily change which is the ‘master’ server and which are to be the ‘slaves’.**

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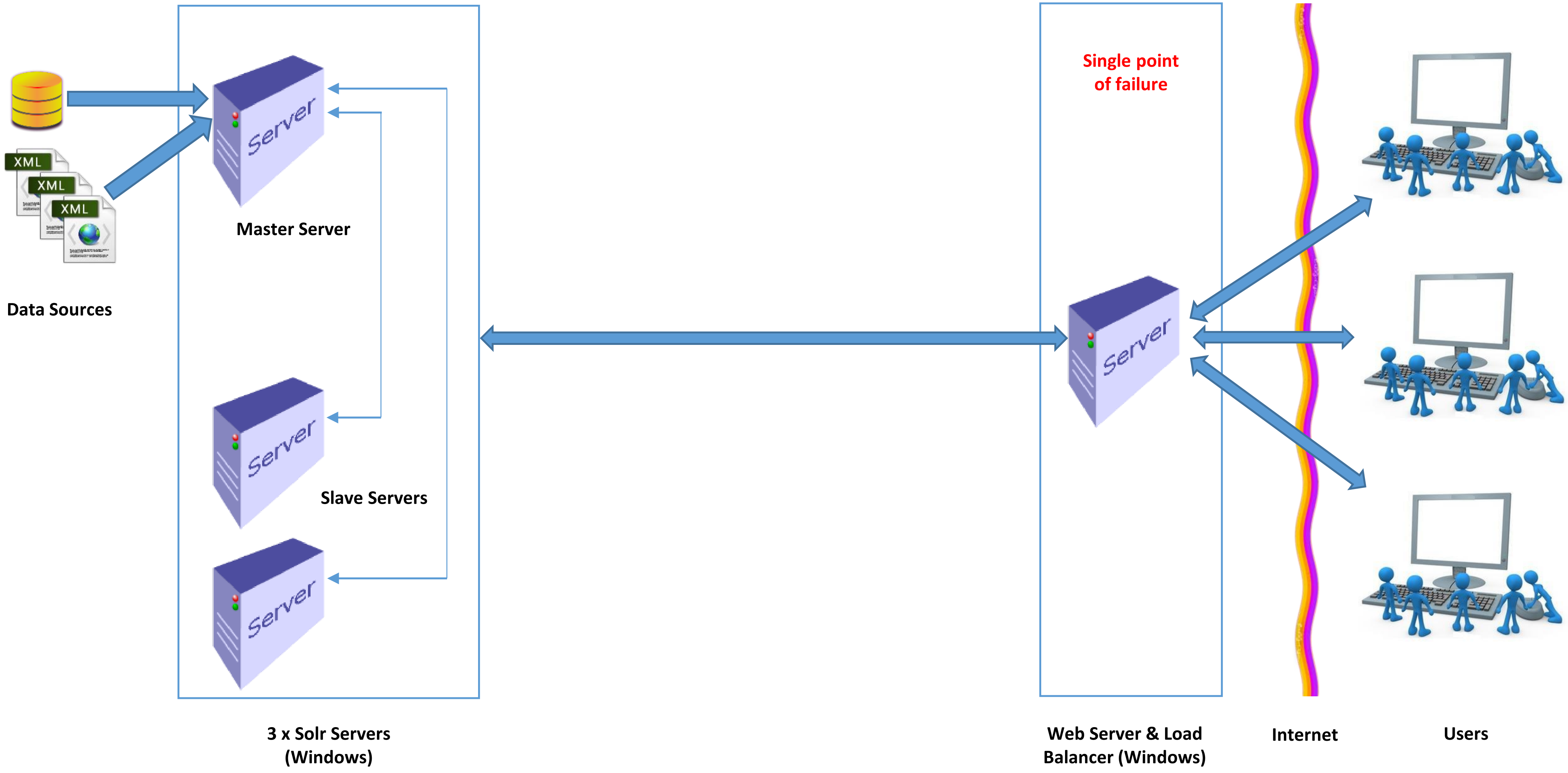
    - **Easily Configurable**
      - **A simple system for uploading the Solr configuration files across the different environments, with the ability of allowing different behaviours for each Core within them.**

Solr Replication implementation



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  - The single points of failure have been reduced to just one, which is in the actual Web Server and is where the load balancer now resides.
  - **Everything is now easily configurable, scalable, almost maintenance-free and above all is ultra-reliable.**

Solr Replication implementation

- Disadvantages…
  - **A slight delay, barely noticeable in a Web UI, may be experienced if a request to a given Solr server fails and the load balancer has to redirect the request to the other available server.**

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  - **As there is no Zookeeper component to replicate the indexes to the other servers, the onus is now on the ‘slave’ servers to poll the ‘master’ periodically and update their indexes from the ‘master’ copies. This is a built-in feature of Solr and the location of the ‘master’ server and the polling time is easily configurable.**

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  - **Unlike the ‘Mule’ in Cloud working, the extremely lightweight in-house load balancer does not know the state of the servers in the Solr ensemble. It knows the last server it tried so for the next query it will try another server it knows about. If it is unable to process the query then it will switch to another one, until there are no more servers to try, whereupon it will send an error email to concerned parties (ADM).**

Solr Replication implementation

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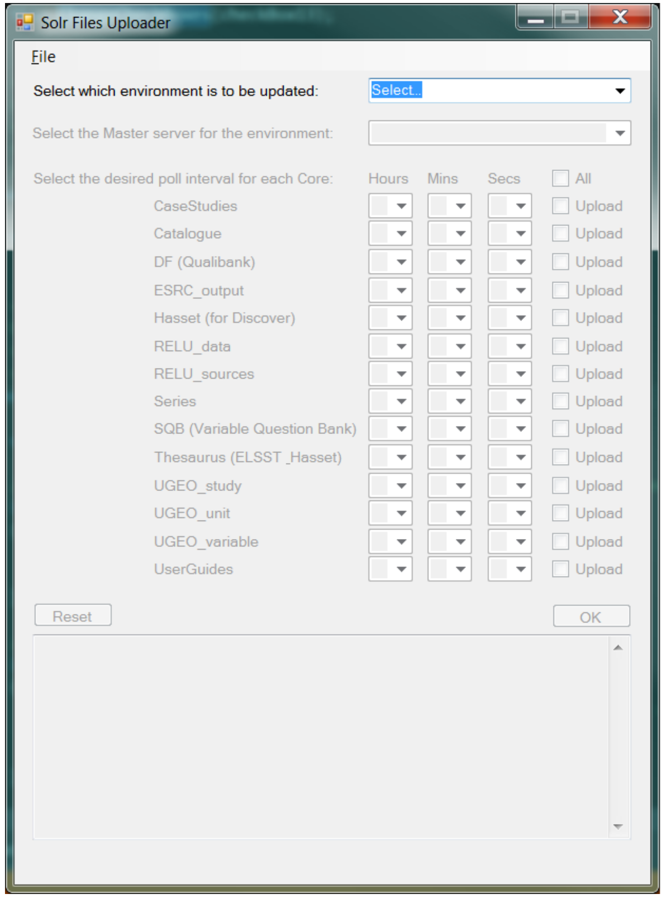
  - We could however put the ‘master’ server as a server used for Solr searches too, if required.
  - **We could easily add in another ‘slave’ server if required, it’s all in the configuration files.**

Solr Replication implementation

- Configuration
  - There is a new in-house tool that has been built for easily changing and uploading configuration files:



Solr Files Uploader

File

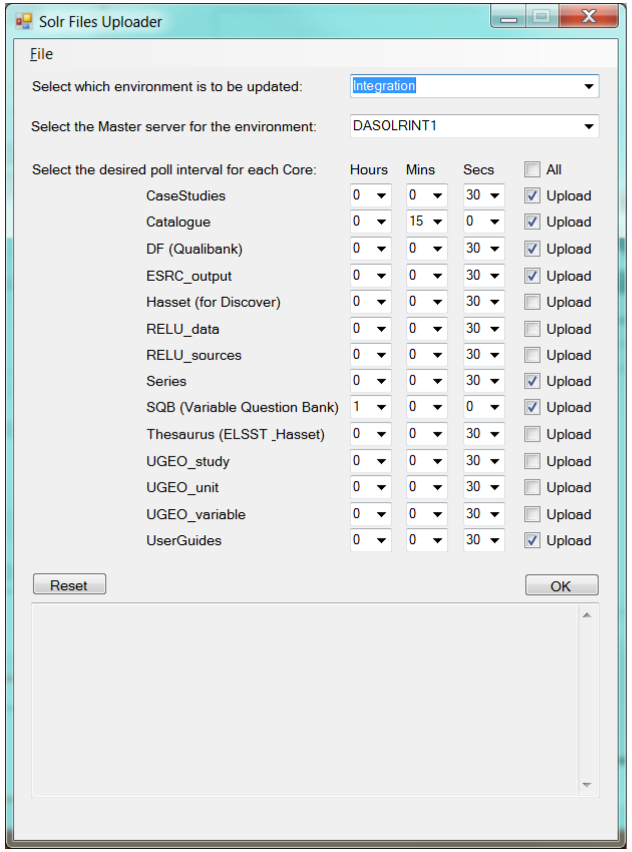
Select which environment is to be updated: Select..

Select the Master server for the environment:

Select the desired poll interval for each Core:	Hours	Mins	Secs	□ All
CaseStudies				□ Upload
Catalogue				□ Upload
DF (Qualibank)				□ Upload
ESRC_output				□ Upload
Hasset (for Discover)				□ Upload
RELU_data				□ Upload
RELU_sources				□ Upload
Series				□ Upload
SQB (Variable Question Bank)				□ Upload
Thesaurus (ELSST_Hasset)				□ Upload
UGEO_study				□ Upload
UGEO_unit				□ Upload
UGEO_variable				□ Upload
UserGuides				□ Upload

Solr Replication implementation

- Configuration
  - Environments, ‘master’ servers, Cores and replication polling times can easily be configured:



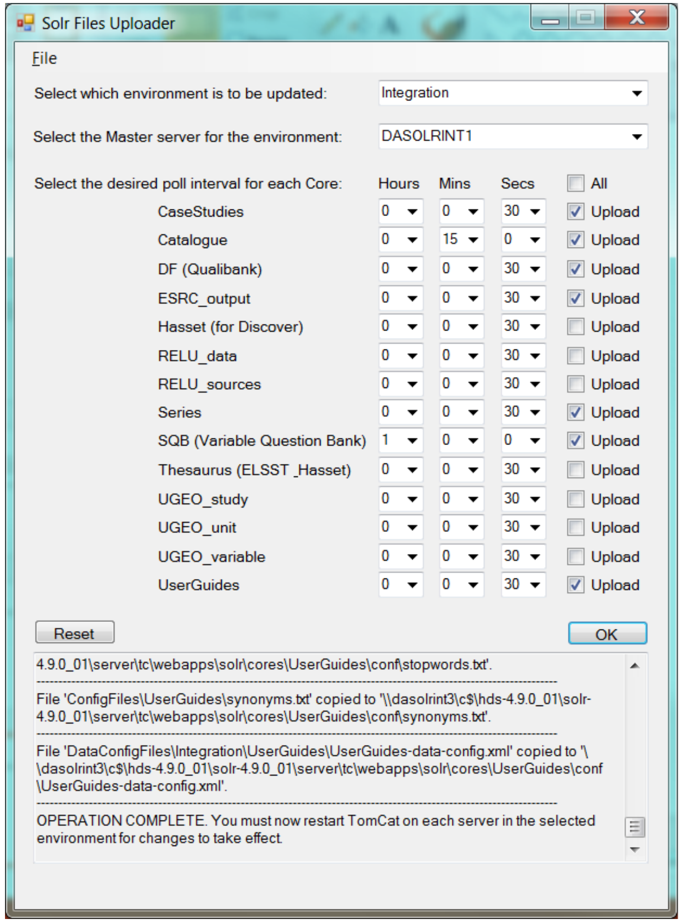
Select which environment is to be updated: Integration

Select the Master server for the environment: DASOLRINT1

Select the desired poll interval for each Core:	Hours	Mins	Secs	□ All
CaseStudies	0	0	30	☑ Upload
Catalogue	0	15	0	☑ Upload
DF (Qualibank)	0	0	30	☑ Upload
ESRC_output	0	0	30	☑ Upload
Hasset (for Discover)	0	0	30	□ Upload
RELU_data	0	0	30	□ Upload
RELU_sources	0	0	30	□ Upload
Series	0	0	30	☑ Upload
SQB (Variable Question Bank)	1	0	0	☑ Upload
Thesaurus (ELSST _Hasset)	0	0	30	□ Upload
UGEO_study	0	0	30	□ Upload
UGEO_unit	0	0	30	□ Upload
UGEO_variable	0	0	30	□ Upload
UserGuides	0	0	30	☑ Upload

Solr Replication implementation

- Configuration
  - Progress and event logging is presented clearly:



Select which environment is to be updated: Integration

Select the Master server for the environment: DASOLRINT1

Select the desired poll interval for each Core:	Hours	Mins	Secs	□ All
CaseStudies	0	0	30	☑ Upload
Catalogue	0	15	0	☑ Upload
DF (Qualibank)	0	0	30	☑ Upload
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Series	0	0	30	☑ Upload
SQB (Variable Question Bank)	1	0	0	☑ Upload
Thesaurus (ELSST_Hasset)	0	0	30	□ Upload
UGEO_study	0	0	30	□ Upload
UGEO_unit	0	0	30	□ Upload
UGEO_variable	0	0	30	□ Upload
UserGuides	0	0	30	☑ Upload

```
4.9.0_01\server\tc\webapps\solr\cores\UserGuides\conf\stopwords.txt'.
--------------------------------------------------------------------------------
File 'ConfigFiles\UserGuides\synonyms.txt' copied to '\\dasolrint3\c$\hds-4.9.0_01\solr-
4.9.0_01\server\tc\webapps\solr\cores\UserGuides\conf\synonyms.txt'.
--------------------------------------------------------------------------------
File 'DataConfigFiles\Integration\UserGuides\UserGuides-data-config.xml' copied to '\
\dasolrint3\c$\hds-4.9.0_01\solr-4.9.0_01\server\tc\webapps\solr\cores\UserGuides\conf
\UserGuides-data-config.xml'.
--------------------------------------------------------------------------------
OPERATION COMPLETE. You must now restart TomCat on each server in the selected
environment for changes to take effect.
```

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  - **The Web application should be pointed at the load balancer.**

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- Conclusion