

FileXfer

File Transfer Jobs

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Abstract

The FileXfer application is a system for automated file transfer jobs for copying files. “There are 3 applications that make up the usage collection framework: `filexfer`, which does the actual file transfers; `filexfer-jobmonitor`, which is configured to monitor various aspects of jobs and create NMS alarms when necessary; and `filexfer-dataloader`, which bulk-loads file data into database tables. There are also house-keeping scripts called `filexfer-filearchive`, which keeps files in the data directory pruned and compressed, and `filexfer-fileunarchive`, which allows files to be pulled out of the archive so filexfer jobs can work with them again.”¹

¹[Usage Collection Framework \(filexfer\)](#)

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List of Definitions and Abbreviations

- **MOA** - Municipality of Anchorage

1 Introduction

FileXfer is a custom application that GCI OSS built whose primary purpose is to transfer files from point A to point B (most of the time via point C/itself). It can also be used to load the collected data into a database if the data fits within the constraints of MySQL Load Data Infile SQL Syntax. It supports FTP and SFTP for both gets and puts, and it also has limited support for HTTP gets (this feature is used to collect weather camera images off of the Terra mountain top sites for the FAA).²

FileXfer can also be used to prune the source server's target files to a certain number of days. And while the default is to keep the source file time, this feature can be toggle off on a per job basis, resulting in the files having the transfer time instead as some customers prefer to know when the file was dropped off and not when the file was generated. For performance reasons there is a cutoff feature as well which defaults to 5 days for new jobs. FileXfer will not look more than the cutoff days back to see if a file should be collected and/or exported. FileXfer jobs are also capable of running in audit mode, in which FileXfer will log all of the transfers but it won't physically transfer anything. This feature can be useful to get a feed caught up without transferring a bunch of files around if for whatever reason the backlog of files doesn't need to be processed by any customers.

FileXfer logs all file transfers and any errors. However, it is not considered an error if there are no files to collect. FileXfer also supports monitoring of transfer jobs, and can generate an alert for any reason that you can articulate with SQL. Some examples include late and/or missing files, load queue too large, file too small, no files transferred for a certain interval, etc. The monitoring supports internal only alerts, TAC visible alerts, and/or emailing the alerts. The email feature also supports sending of texts to cell phones.

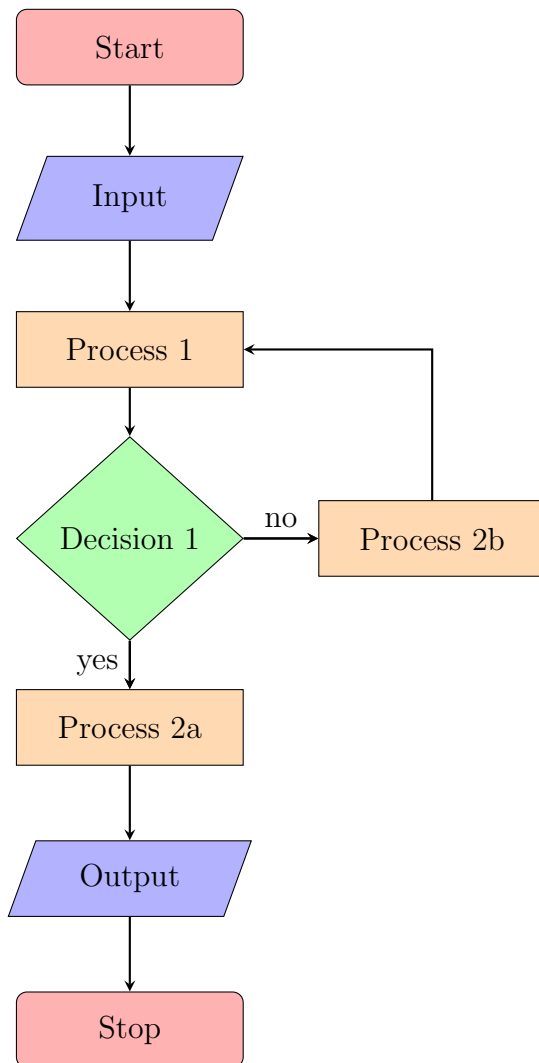
FileXfer will re-transfer a file if either the size and/or source file time changes, as that signals something about the file has changed. Some feeds leverage this concept as they may use a static filename in which the data is simply re-written to same exact file at regular intervals.

The main FileXfer app server is `prod-prov4-cdr1.operations.gci.com` (192.168.161.47). The "ACS" / Project Seward FileXfer app server (which contains only ACS/Project Seward related jobs) is the SPS2 OSS Test app server, `osstest-em-provisioning.operations.gci.com` (192.168.56.4; public IP 66.223.155.33).

²FileXfer.txt:3, GCI Network Services, OSS Mark Blum, Spring 2016

2 Design

[FIXME: Need data here...]



[FIXME: Customize flowchart FileXfer]

3 Schema

The main FileXfer database server is `sadc-cdr-mysql1.operations.gci.com` (192.68.56.189) and the ACS/Project Seward FileXfer database server is the SPS2 OSS Test database server, `osstest-db-provisioning.operations.gci.com` (192.168.69.149). For both database servers the FileXfer database is called `filexfer`.³

Here's a breakdown of the tables:

```
[mblum@development-mark ~]$ mysql -h sadc-cdr-mysql1 -sss \
-e "USE filexfer; SHOW TABLES"
DATABASECHANGELOG
DATABASECHANGELOGLOCK
errors
joblogs
jobs
loadjobs
loadqueue
logs
monitors
```

```
DATABASECHANGELOG
DATABASECHANGELOGLOCK
```

These two tables manage how updates to the database structure of FileXfer are preformed and stored.

3.1 errors

This table stores any errors FileXfer encounters.

3.2 joblogs

This is actually a view. Here's the create statement:

```
CREATE
  ALGORITHM = UNDEFINED
  DEFINER = 'filexfer'@'%'
  SQL SECURITY DEFINER
VIEW 'filexfer'.'joblogs' AS
  SELECT
    'j'.'idJob' AS 'idJob',
    'l'.'idLog' AS 'idLog',
```

³FileXfer.txt:11, GCI Network Services, OSS Mark Blum, Spring 2016


```

    'j'.'jobName' AS 'jobName',
    'j'.'neName' AS 'neName',
    'l'.'srcFileName' AS 'srcFileName',
    'l'.'srcFileSize' AS 'srcFileSize',
    'l'.'srcFileTime' AS 'srcFileTime',
    'l'.'destFileSize' AS 'destFileSize',
    'l'.'destFileName' AS 'destFileName',
    'l'.'dtTransferStart' AS 'dtTransferStart',
    'l'.'dtTransferStop' AS 'dtTransferStop'
FROM
    ('filexfer'.'jobs' 'j'
 JOIN 'filexfer'.'logs' 'l' ON (('j'.'idJob' = 'l'.'idJob')));

```

3.3 jobs

This stores all of the transfer jobs. Transfer jobs utilize a cron like schedule, and their run policy can be set to schedule (i.e. run as per the cron schedule), always, and never. There is also a wantSummary field that can be set to either yes or no. Some customers (mainly StarSolutions MSC Usage jobs) want summaries of the transfer file (number of records etc.) and this feature automatically generates that and transfer it along with the file. Priority is another feature of the FileXfer system. Given a limited amount of resources you can set differing priority levels for jobs (1 - 100 with 1 being the highest priority), so that jobs with higher priorities get preference over lower priority jobs when system resources are constrained. Generally production jobs get high priority (5) and lab/test jobs get low priority (100).

The `neName` field, which stands for Network Element Name, basically defines the directory where the files will be stored. They are stored in `/data/usage/[neName]`. Files are automatically archived if they are older than 2 days (to `/data/usage/[neName]/archive`), and archived files are deleted if they are older than 30 days. There is a script that can be used to unarchive files (say for retransfer purposes) called `/usr/bin/filexfer-fileunarchive`. It takes a file mask to unarchive and supports glob syntax.

The `idSite` field is an incomplete feature and not really used at this time.

3.4 loadjobs

This stores all of the load jobs. Not every transfer job has a corresponding load job, and some transfer jobs may have more than one load job.

3.5 loadqueue

This is the queue for the load jobs. Entries in here have yet to be loaded. The loading is done in order.

Here's a SQL query that can be used to view the loadqueue:

```
# FileXfer Load Queue Status
SELECT idJob, idLoadJob, jobName, neName,
IF( idJob = 0, FROM_UNIXTIME( Count ), Count ) AS 'Count', fileName, fileTime
FROM
(
SELECT 0 AS 'idJob', 0 AS 'idLoadJob', 'Current Time' AS 'jobName',
      'neName', UNIX_TIMESTAMP( NOW() ) AS 'Count', 'fileName', 'fileTime'

UNION

SELECT idJob, idLoadJob, jobs.jobName, jobs.neName, COUNT(*),
      fileName, fileTime
FROM filexfer.loadqueue
JOIN filexfer.loadjobs USING ( idLoadJob )
JOIN filexfer.jobs USING ( idJob )
GROUP BY 'idJob'
ORDER BY ( CASE WHEN 'idJob' = 0 THEN 0 ELSE 1 END ) ASC, 5 DESC
) x;
```

3.6 logs

This is the table where all of the transfer logs are kept. In order to retransfer a specific file that has not changed you will have to delete the corresponding log entry. Log entries are never pruned from this table.

3.7 monitors

This table encompasses all of the job monitors. Like load jobs, not every transfer job has a job monitor, and some transfer jobs may have more than one job monitor.

4 Implementation

[FIXME: Need data here...]

4.1 Dependencies

[FIXME: Need data here...]

4.2 Configuration

[FIXME: Need data here...]

4.3 Relevance

[FIXME: Need data here]

4.4 Scripts

The FileXfer app is made up of several scripts which are crond to run, as follows:⁴

```
[root@prod-prov4-cdr1 ~]# cat /etc/cron.d/filexfer
MAILTO=""
PERL5LIB=/opt

# This script preforms all of the get/collect jobs.
* * * * * filexfer /usr/bin/filexfer -c /etc/filexfer/filexfer-get.conf -t get
# This script preforms all of the put/export jobs.
* * * * * filexfer /usr/bin/filexfer -c /etc/filexfer/filexfer-put.conf -t put

# This script runs all of the job monitor jobs, and generates the relevant alerts and/or
* * * * * filexfer /usr/bin/filexfer-jobmonitor -c /etc/filexfer/jobmonitor.conf

# This script runs all of the data loader jobs.
* * * * * filexfer /usr/bin/filexfer-dataloader -c /etc/filexfer/dataloader.conf
#* * * * * filexfer /usr/bin/filexfer-epg-dataloader.plx -c /etc/filexfer/epg-dataloader

# These scripts take care of the archiving
2 0 * * * filexfer for dir in /data/usage/*; do /usr/bin/filexfer-filearchive $dir >>/va
5 0 * * * filexfer find /data/usage -type f -name \*.sum -mmin +43200 | xargs rm
```

FileXfer also has the concept of userscripts. These are scripts that are run after files are collected and before they are exported (in general).

```
[root@prod-prov4-cdr1 ~]# cat /etc/cron.d/filexfer-userscripts
MAILTO=""
PERL5LIB="/opt"
PV_TEST_PERL=1

* * * * *          filexfer chmod 644 /data/usage/SDE01P/*
* * * * *          filexfer chmod 644 /data/usage/SDE01L/*
0-14 0 * * *       filexfer /usr/lib/filexfer/\
strip-spaces-from-csv.pl >>/var/log/filexfer/strip-spaces-from-csv.log 2>&1
0-14 1 * * *       filexfer /usr/lib/filexfer/\
convert-wps-om-counters-report.pl >>/var/log/filexfer/\
convert-wps-om-counters-report.log 2>&1
0-14 1 * * *       filexfer /usr/lib/filexfer/\
convert-wps-om-counters-report-part2.pl >>/var/log/filexfer/\
convert-wps-om-counters-report-part2.log 2>&1
*/15 * * * *       filexfer /usr/lib/filexfer/\
ericsson-oss-rl-reports-preprocess.sh -v /data/usage/OSS01/preprocess/rl*.out \
```

⁴FileXfer.txt:93, GCI Network Services, OSS Mark Blum, Spring 2016

```

>>/var/log/filexfer/ericsson-oss-rl-reports-preprocess.log 2>&1
20 * * * *          filexfer /usr/lib/filexfer/\
ericsson-oss-sts-reports-preprocess.plx GCIMSC0 \
/data/usage/OSS01/preprocess/*GCIMSC0* >>/var/log/filexfer/\
ericsson-oss-sts-reports-preprocess.log 2>&1
20 * * * *          filexfer /usr/lib/filexfer/\
ericsson-oss-sts-reports-preprocess.plx ANAKB01 \
/data/usage/OSS01/preprocess/*ANAKB01* >>/var/log/filexfer/\
ericsson-oss-sts-reports-preprocess.log 2>&1
*/4 * * * *          filexfer /usr/lib/filexfer/\
stp-rop-logs-preprocess.sh -v /data/usage/{SADC5E,SDC5E}/\
preprocess/stp*.log >>/var/log/filexfer/stp-rop-logs-preprocess.log 2>&1
*/5 1 * * *          filexfer /usr/lib/filexfer/\
teltronics-eos-preprocess.sh -v /data/usage/EOS01/\
preprocess/BR*.IBR.primary >>/var/log/filexfer/teltronics-eos-preprocess.log 2>&1
* * * * *          filexfer /usr/lib/filexfer/\
teltronics-eos-preprocess.sh -v /data/usage/EOS01/\
preprocess/BR*.IBR.primary >>/var/log/filexfer/teltronics-eos-preprocess.log 2>&1
20-25 * * * *          filexfer /usr/lib/filexfer/\
interop-mmsc-preprocess.sh -v /data/usage/IOP01/preprocess/A*.dat \
>>/var/log/filexfer/interop-mmsc-preprocess.log 2>&1
*/5 * * * *          filexfer /usr/lib/filexfer/\
homisco-preprocess.sh -v /data/usage/HMSC01/preprocess/*.txt \
>>/var/log/filexfer/homisco-preprocess.log 2>&1
10,25,40,55 * * * *          filexfer /usr/lib/filexfer/\
ExtractCarrierTurboZoneUsage/ExtractCarrierTurboZoneUsage/\
ExtractCarrierTurboZoneUsage_run.sh --context_param fileMask=acs_15min_*.csv \
--context_param carrierId=ACS --context_param carrierPassphraseFilepath=\
/etc/filexfer/acs-gpg-passphrase.txt \
--context_param carrierFilenameFormat="'wifi-'yyyyMMddHHmm'.csv'" \
>>/var/log/filexfer/ExtractCarrierTurboZoneUsage_ACS.log 2>&1
00 06 * * *          filexfer /usr/lib/filexfer/processLegacyUsage4.plx
30 06 * * *          filexfer /usr/lib/filexfer/loadWispData.plx
20 02 * * *          filexfer /usr/lib/filexfer/aubstats.sh

```

4.5 Logging

Application Logging

The filexfer applications log to the /var/log/filexfer directory on prod-prov4-cdr1.\operations.gci.com. The parent filexfer jobs log to filexfer-get.log and filexfer-put.log. The jobmonitor and dataloader applications log to jobmonitor.log and dataloader.log. The filexfer applications log to the /var/log/filexfer directory on prod-prov4-cdr1.operations.gci.com. The parent filexfer jobs log to filexfer-get.log and filexfer-put.log. The jobmonitor and dataloader applications log to

`jobmonitor.log` and `dataloader.log`, respectively. Each file transfer job is executed as a child process and gets its own log file. The format is `filexfer-{neName}-{idJob}-{get,put}.log`.

By default, the jobs log at the warn level. Adjust the level to info to get a high-level view of the application's state. Adjust log verbosity by modifying the appropriate config file in `/etc/filexfer`. The changes will take effect after the next program execution.

Errors are also logged to a database table which can be browsed in the filexfer web interface under the 'Logs & Errors' view. This view includes messages logged at **warn**, **error**, and **fatal** severity.⁵

File Transfer Logging

Every file transfer is recorded in a database table. There are two reasons for this table: first, it tells **filexfer** which files have already been transferred, and second, it provides an audit trail for SOX compliance. The table is `filexfer.logs` on `sadc-cdr-mysql1.operations.gci.com`. Use the `filexfer.joblogs` view to easily find logs by job name or network element ID.

File transfer logs may also be viewed in the 'Logs & Errors' page of the web interface.⁶

⁵Usage Collection Framework (filexfer)

⁶Usage Collection Framework (filexfer)

4.6 Test

[FIXME: Need data here...]

4.7 Issues

[FIXME: Need data here...]

5 Operation

There is a FileXfer GUI app on Relevance that can be used to create/delete/update transfer/load jobs and monitors, and view logs and errors. It is available on both presenter 4 on presenter 1 (but at this time it is safer to use presenter 4 to update jobs). Also the lab presenter (lab-presenter4) is currently pointed at the production ACS FileXfer instance.⁷

5.1 FileXfer

There are times it is desirable to run FileXfer outside of the FileXfer GUI app on Relevance. Perhaps when it is desirable to execute a single file transfer job. To do this login to GCI Network Services, OSS `prod-prov4-cdr1.operations.gci.com` (192.168.161.47).

The `filexfer` command is available from the command line. It has relative straightforward syntax:

```
[root@prod-prov4-cdr1 usage]# /usr/bin/filexfer
Usage:
    filexfer.plx -c configfile -t {get|put} [options]
```

```
[root@prod-prov4-cdr1 usage]# cd ~
[root@prod-prov4-cdr1 ~]# /usr/bin/filexfer
Usage:
    filexfer.plx -c configfile -t {get|put} [options]
```

```
[root@prod-prov4-cdr1 ~]# /usr/bin/filexfer --help
Usage:
    filexfer.plx -c configfile -t {get|put} [options]
```

Arguments:

- c, --configfile
Specify the configuration file to load. Must be in YAML format.
- t, --transfertype
One of "get" or "put". Get jobs download files and put jobs upload files.

Options:

- d, --piddir
Directory where the pid file will be written. Defaults to `/var/run/filexfer`.

⁷FileXfer.txt:149, GCI Network Services, OSS Mark Blum, Spring 2016

`--db`
Sets the database connection parameters. Valid keys are: server (default localhost), port (default 3306), driver (default mysql), uid, pwd, database, and table. Specify tags as key/value pairs, e.g.:

 `--db server=localhost --db database=filexfer`

`-e, --evegehost`
Address of the Evege web server. Used to send indicators and events to the NMS system.

`--evengetimeout`
Timeout in seconds for communicating with the Evege web server. Defaults to 10.

`-f, --cachefile`
Template cache file location. Defaults to /var/lib/filexfer/filexfer.kch.

`-h, --help`
Output this documentation.

`-m, --maxchildren`
Maximum number of child processes to spawn. Defaults to 50.

`-p, --pidfile`
PID file name. This will be appended with a ".pid" suffix.

`-r, --resource`
Resource name of this application. Used in indicator and event messages sent to the NMS system.

`--verbose, -v`
Log to the screen at increasingly verbose levels. This option may be repeated multiple times to increase the log level. For example, "-v" logs at info level, "-vv" logs at debug level, and "-vvv" logs at trace level.

```
[root@prod-prov4-cdr1 ~]#
```

The files transfered filexfer are under the /data/usage/ directory.

```
$ ssh hnmadm@prod-prov4-cdr1
hnmadm@192.168.161.47's password:
```

Last login: Fri Aug 19 15:36:27 2016 from 10.103.193.217

```
[hnmadm@prod-prov4-cdr1 ~]$ cd /data/usage/
```

```
[hnmadm@prod-prov4-cdr1 usage]$ ls
```

AAA01	GA05	GA23	GA44	GA68	GC28	GC50	HAR01	P810	SPB02
ACS01	GA06	GA24	GA45	GA71	GC30	GC51	HCR01	P811	SPS02
AUB01	GA07	GA26	GA46	GA73	GC31	GC52	HMSC01	RBB01	SWPP01
BAL01	GA08	GA27	GA47	GA76	GC34	GC66	INC01	reports	SYNIVERSE
CAR01	GA09	GA28	GA48	GA77	GC35	GC87	INC02	RXNET01	TAL01
CBM01	GA10	GA29	GA49	GC05	GC36	GC88	INC03	SADC5E	TCS01
CDMA	GA11	GA30	GA50	GC15	GC37	GC89	IOP01	SBC01	TMP01
cdrReports	GA12	GA32	GA51	GC16	GC38	GC90	KUL01	SDC5E	TSUNAMI
CON01	GA13	GA33	GA52	GC17	GC39	GC91	legacy	SDE01	UNG01
CSKY01	GA14	GA34	GA53	GC18	GC41	GC93	LGCBX01	SDE01L	UNK01
CSKY02	GA15	GA35	GA55	GC19	GC42	GC94	MSW01	SDE01P	VORTEX01
DIM01	GA16	GA36	GA56	GC20	GC43	GC95	MTAS01	SDE02	WIFI01
EOS01	GA17	GA37	GA57	GC21	GC44	GC97	MUK01	SDE02L	WISP01
EPG01	GA18	GA38	GA58	GC22	GC45	GC98	Nov-18	SDE02P	WPS01
EPG02	GA19	GA39	GA59	GC23	GC46	GCT1	NRTRADE	SGSN01	
GA01	GA20	GA41	GA65	GC24	GC47	GCT2	OCR01	SHU01	
GA03	GA21	GA42	GA66	GC26	GC48	GGSN01	OSS01	SMSC01	
GA04	GA22	GA43	GA67	GC27	GC49	GSM	P8	SPB01	

```
[hnmadm@prod-prov4-cdr1 usage]$ sudo -s
```

Password:

```
[root@prod-prov4-cdr1 archive]#
```

The directory names under /data/usage/ map to the neName column in the filexfer.jobs table that is displayed in the FileXfer GUI application under the File Transfer Jobs display in the NE ID field.

The filexfer get jobs currently executing can be inspected with:

```
[root@prod-prov4-cdr1 usage]# ps ax | grep get
17585 ?          S          0:00 /usr/bin/filexfer \
-c /etc/filexfer/filexfer-get.conf -t get P8
17586 ?          S          0:00 /usr/bin/filexfer \
-x /etc/filexfer/filexfer-get.conf -t get P811
17588 ?          SN         0:00 /usr/bin/filexfer \
-c /etc/filexfer/filexfer-get.conf -t get SMSC01
17593 ?          SN         0:00 /usr/bin/filexfer \
-c /etc/filexfer/filexfer-get.conf -t get KUL01
17594 ?          SN         0:00 /usr/bin/filexfer \
-c /etc/filexfer/filexfer-get.conf -t get CAR01
24286 ?          S          0:00 /usr/bin/filexfer \
-c /etc/filexfer/filexfer-get.conf -t get GCT2
```

```
[root@prod-prov4-cdr1 usage]#
```

The filexfer put jobs currently executing can be inspected with:

```
[root@prod-prov4-cdr1 usage]# ps ax | grep put
...
 3863 ?      S      0:00 /usr/bin/filexfer \
-c /etc/filexfer/filexfer-put.conf -t put GC93
 3864 ?      S      0:00 /usr/bin/filexfer \
-c /etc/filexfer/filexfer-put.conf -t put GC94
 3866 ?      S      0:00 /usr/bin/filexfer \
-c /etc/filexfer/filexfer-put.conf -t put GC37
 3867 ?      S      0:00 /usr/bin/filexfer \
-c /etc/filexfer/filexfer-put.conf -t put GC95
 3869 ?      S      0:00 /usr/bin/filexfer \
-c /etc/filexfer/filexfer-put.conf -t put GA32
 3870 ?      S      0:00 /usr/bin/filexfer \
...
[root@prod-prov4-cdr1 usage]#
```

The same filexfer syntax displayed in the process list can be using to execute an individual job to transfer files:

```
[root@prod-prov4-cdr1 ~]# /usr/bin/filexfer
```

Usage:

```
filexfer.plx -c configfile -t {get|put} [options]
```

```
[root@prod-prov4-cdr1 ~]
```

```
[root@prod-prov4-cdr1 ~]# /usr/bin/filexfer -c /etc/filexfer/filexfer-put.conf -t put GO
```

5.2 Job Scheduling

Jobs are scheduled using a web interface at nms.operations.gci.com/relevance. Navigate to the “FileXfer” application and click the “File Transfer Jobs” link. Job execution happens on prod-prov4-cdr1.operations.gci.com. A cron job executes every minute from `/etc/cron.d/filexfer` to kick off the various `filexfer` scripts.⁸

New Job

The basic requirements for setting up a transfer new job are as follows:⁹

POC: [for when problems occur]

IP: [source host for collect jobs/destination host for export jobs]

Protocol: [ftp/sftp]

Credentials: [username/password]

File Path:

File Mask: [supports glob syntax]

Schedule: [cron syntax]

Want Summary: [yes/no; generally only for StarSolutions CDR exports]

Job Timing

The parent `filexfer` script is responsible for spawning child processes for each job. Since a large number of jobs can be scheduled at any given interval, the parent process limits how many children can run concurrently. As long as the limit is reached and more jobs need to be spawned, the parent process must stay alive. Since this may take longer than 1 minute, it is possible for `filexfer` to miss certain scheduling intervals.

For example, if 500 jobs are scheduled to run at the top of every hour (`0 * * * *`) and the maximum child process limit is 50, there is a good chance `filexfer` will not execute any jobs scheduled to run at 1 minute past the hour (`1 * * * *`). The best way to avoid this

⁸[Usage Collection Framework \(filexfer\)](#)

⁹`FileXfer.txt:139`, GCI Network Services, OSS Mark Blum, Spring 2016

is to use 0, 15, 30, or 45 in the minute field of the job schedule. These intervals are always executed.^{[10](#)}

5.3 Job Monitoring

The Relevance based FileXfer software has a Job Monitors section where Email notifications can be configured.

5.4 Dataloader

Dataloader jobs are configured using the web interface at `nms.operations.gci.com/relevance`. Navigate to the “FileXfer” application and click the “Data Load Jobs” link. These jobs are executed every minute as long as there are files in the load queue.^{[11](#)}

5.5 Relevance

[FIXME: Need data here]

¹⁰[Job Timing](#)

¹¹[Usage Collection Framework \(filexfer\)](#)

Appendix

Source

There are 3 primary FileXfer perl scripts on prod-prov4-cdr1:¹²

File name	Attributes	Description
filexfer.plx	181 lines	File transfer jobs
filexfer-dataloader.plx	132 lines	Data loader
filexfer-jobmonitor.plx	132 lines	Job Monitor

Table 1: FileXfer perl scripts on prod-prov4-cdr1

¹²prod-prov4-cdr1.operations.gci.com (192.168.161.47, NATed IP: 66.223.199.228), data including CDRs and such under /data/usage/ — Network Services, OSS.

filexfer.plx — File Transfer Jobs

```

1  #!/usr/bin/perl
2
3  use strict;
4  use warnings;
5
6  use Modules::App::FileXfer ();
7  our $VERSION = $Modules::App::FileXfer::VERSION;
8
9  # Core modules
10 use Clone qw( clone );
11 use File::Basename ();
12 use File::Spec ();
13 use POSIX ();
14
15 $SIG{CHLD} = \&Modules::App::FileXfer::REAPER;
16
17 MAIN: {
18     # Process and merge command-line and config file options
19     my $getopt = Modules::App::FileXfer::
20         ↪ get_command_line_options();
21     my $fileconf = Modules::App::FileXfer::read_config_file(
22         ↪ $getopt->get_configfile );
23     Modules::App::FileXfer::merge_options( $getopt, $fileconf );
24
25     # Make sure we're the only instance running
26     Modules::App::FileXfer::check_pid_file( $Modules::App::
27         ↪ FileXfer::Options->{pidfile} );
28
29     # Get logger and evenge objects
30     Modules::App::FileXfer::create_evenge_obj();
31     my $logger = Modules::App::FileXfer::create_logger_obj(
32         ↪ $Modules::App::FileXfer::Options->{logger}, $Modules::App
33         ↪ ::FileXfer::Program );
34
35     # Get the ready jobs
36     my $fx = Modules::App::FileXfer::create_filexfer_obj(
37         ↪ $Modules::App::FileXfer::Program );
38     my $jobs = Modules::App::FileXfer::get_jobs( $fx );
39     my $loadjobs = Modules::App::FileXfer::get_jobs_with_load_jobs
40         ↪ ( $fx );
41     undef $fx;
42 }

```



```

37     for my $job ( @{ $jobs } )
38     {
39         # Enforce the "max children" constraint
40         $logger->info( 'Max child processes reached. Waiting for
    ↪ one to complete before starting job.' )
41         if ( scalar keys %Modules::App::FileXfer::Children
42             >= $Modules::App::FileXfer::Options->{maxchildren
    ↪ } );
43
44         sleep 1 while ( scalar keys %Modules::App::FileXfer::
    ↪ Children
45                       >= $Modules::App::FileXfer::Options->{
    ↪ maxchildren} );
46
47         # Fork a child process for this job
48         $logger->info( sprintf( 'Spawning child process for job "%s".', $job->jobName ) );
49
50         my $pid = fork;
51         defined $pid or Modules::App::FileXfer::log_event(
52             5, sprintf( "Can't fork for job \"%s\": %s", $job->
    ↪ jobName, $! ), 'logdie' );
53
54         if ( $pid == 0 ) # child
55         {
56             # Set random seed for this child
57             srand();
58
59             # Lower the OS scheduling priority based on job
    ↪ priority
60             POSIX::nice( Modules::App::FileXfer::pri_to_nice( $job
    ↪ ->priority ) );
61
62             # Add the NE name to our command line string
63             $0 .= " @ARGV " . $job->neName;
64             my $jobtag = Modules::App::FileXfer::get_jobtag( $job
    ↪ );
65
66             # Set the subresource for this job in the evenge
    ↪ object
67             $Modules::App::FileXfer::Evenge->subresourceName( $job
    ↪ ->jobName );
68
69             # Create a logger specific to this child process

```

```

70         my $logopt = clone( $Modules::App::FileXfer::Options
71             ↪ ->{logger} );
72         my ( undef, $logdir ) = File::Basename::fileparse(
73             ↪ $logopt->{file}{filename} );
74         $logopt->{file}{filename} = File::Spec->catfile(
75             ↪ $logdir, "$jobtag.log" );
76
77         $logger->delete();
78         my $logger = Modules::App::FileXfer::create_logger_obj
79             ↪ ( $logopt, $job->jobName );
80         Log::Log4perl::MDC->put( 'idJob', $job->idJob );
81
82         # Make sure another instance isn't still running
83         Modules::App::FileXfer::check_pid_file( $jobtag );
84
85         # Create a FileXfer object for database updates
86         my $fx = Modules::App::FileXfer::create_filexfer_obj(
87             ↪ $jobtag );
88
89         # Execute the job
90         Modules::App::FileXfer::run_job( $fx, $job, $loadjobs
91             ↪ );
92
93         $logger->info( 'Child exiting.' );
94         exit 0;
95     }
96     else # parent
97     {
98         $logger->debug( sprintf( 'Spawned child process %d for
99             ↪ job "%s".', $pid, $job->jobName ));
100         $Modules::App::FileXfer::Children{ $pid } = $job->
101             ↪ jobName;
102     }
103 }
104
105 $logger->info( 'Main application exiting.' );
106 }
107
108 # Safely exit
109 $SIG{CHLD} = 'IGNORE';
110
111 __END__
112
113 =head1 NAME

```

```
106
107 filexfer — Move a file from point A to point B over an IP network
108
109 =head1 VERSION
110
111 0.51
112
113 =head1 SYNOPSIS
114
115 filexfer.plx -c configfile -t {get|put} [options]
116
117 =head1 ARGUMENTS
118
119 =over 4
120
121 =item -c, --configfile
122
123 Specify the configuration file to load. Must be in YAML format.
124
125 =item -t, --transfertype
126
127 One of "get" or "put". Get jobs download files and put jobs upload
    ↪ files.
128
129 =back
130
131 =head1 OPTIONS
132
133 =over 4
134
135 =item -d, --piddir
136
137 Directory where the pid file will be written. Defaults to /var/run
    ↪ /filexfer.
138
139 =item --db
140
141 Sets the database connection parameters. Valid keys are: server (
    ↪ default
142 localhost), port (default 3306), driver (default mysql), uid, pwd,
    ↪ database,
143 and table. Specify tags as key/value pairs, e.g.:
144
145     --db server=localhost --db database=filexfer
```

```
146
147 =item -e, --evengehost
148
149 Address of the Evenge web server. Used to send indicators and
    ↪ events to the NMS system.
150
151 =item --evengetimeout
152
153 Timeout in seconds for communicating with the Evenge web server.
    ↪ Defaults to 10.
154
155 =item -f, --cachefile
156
157 Template cache file location. Defaults to /var/lib/filexfer/
    ↪ filexfer.kch.
158
159 =item -h, --help
160
161 Output this documentation.
162
163 =item -m, --maxchildren
164
165 Maximum number of child processes to spawn. Defaults to 50.
166
167 =item -p, --pidfile
168
169 PID file name. This will be appended with a ".pid" suffix.
170
171 =item -r, --resource
172
173 Resource name of this application. Used in indicator and event
    ↪ messages sent to the NMS system.
174
175 =item --verbose, -v
176
177 Log to the screen at increasingly verbose levels. This option may
    ↪ be repeated
178 multiple times to increase the log level. For example, "-v" logs
    ↪ at info level,
179 "-vv" logs at debug level, and "-vvv" logs at trace level.
180
181 =back
```

filexfer-jobmonitor.plx — Job monitor

```

1  #!/usr/bin/perl
2
3  use strict;
4  use warnings;
5
6  use Modules::App::FileXfer::JobMonitor ();
7  our $VERSION = $Modules::App::FileXfer::JobMonitor::VERSION;
8
9  MAIN: {
10     # Process and merge command-line and config file options
11     my $getopt = Modules::App::FileXfer::JobMonitor::
        ↪ get_command_line_options();
12     my $fileconf = Modules::App::FileXfer::JobMonitor::
        ↪ read_config_file( $getopt->get_configfile );
13     Modules::App::FileXfer::JobMonitor::merge_options( $getopt,
        ↪ $fileconf );
14
15     # Make sure we're the only instance running
16     Modules::App::FileXfer::JobMonitor::check_pid_file(
17         $Modules::App::FileXfer::JobMonitor::Options->{pidfile} );
18
19     # Get logger and evenge objects
20     Modules::App::FileXfer::JobMonitor::create_evenge_obj();
21     my $log = Modules::App::FileXfer::JobMonitor::
        ↪ create_logger_obj(
22         $Modules::App::FileXfer::JobMonitor::Options->{logger},
23         $Modules::App::FileXfer::JobMonitor::Program
24     );
25
26     # Get a list of job monitors
27     my $jm = Modules::App::FileXfer::JobMonitor::
        ↪ create_jobmonitor_obj();
28     my $mons = Modules::App::FileXfer::JobMonitor::get_monitors(
        ↪ $jm );
29
30     for my $mon ( @{ $mons } )
31     {
32         Log::Log4perl::MDC->put( 'idJob', $mon->idJob );
33         $log->info( sprintf( 'Executing monitor "%s".', $mon->
        ↪ monitorName ));
34

```

```

35      # Set the subresource for this monitor in the evenge
      ↪ object
36      $Modules::App::FileXfer::JobMonitor::Evenge->
      ↪ subresourceName( $mon->monitorName );
37
38      # Execute the job monitor
39      eval { Modules::App::FileXfer::JobMonitor::run_monitor(
      ↪ $jm, $mon ) };
40      $@ and $log->error( "$@" );
41  }
42
43      $log->info( 'Main application exiting.' );
44 }
45
46 __END__
47
48 =head1 NAME
49
50 jobmonitor — Monitor filexfer jobs for any condition and generate
      ↪ alerts
51
52 =head1 VERSION
53
54 0.51
55
56 =head1 SYNOPSIS
57
58 jobmonitor.plx -c configfile [options]
59
60 =head1 ARGUMENTS
61
62 =over 4
63
64 =item -c, --configfile
65
66 Specify the configuration file to load. Must be in YAML format.
67
68 =back
69
70 =head1 OPTIONS
71
72 =over 4
73
74 =item -a, --mailhost

```

```
75
76 Address of the mail server. Used to send email notifications.
    ↪ Defaults to localhost.
77
78 =item -d, --piddir
79
80 Directory where the pid file will be written. Defaults to /var/run
    ↪ /filexfer.
81
82 =item --db
83
84 Sets the database connection parameters. Valid keys are: server (
    ↪ default
85 localhost), port (default 3306), driver (default mysql), uid, pwd,
    ↪ database,
86 and table. Specify tags as key/value pairs, e.g.:
87
88     --db server=localhost --db database=filexfer
89
90 =item -e, --evengehost
91
92 Address of the Evenge web server. Used to send indicators and
    ↪ events to the NMS system.
93
94 =item -f, --cachefile
95
96 Template cache file location. Defaults to /var/lib/filexfer/
    ↪ jobmonitor.kch.
97
98 =item -h, --help
99
100 Output this documentation.
101
102 =item -i, --mailinterval
103
104 Minimum time, in seconds, before repeat emails may be sent for the
    ↪ same monitor. Defaults to 3600 (1 hour).
105
106 =item -l, --mailfrom
107
108 Sender's email address in email notifications. Defaults to [
    ↪ username]@[hostname].
109
110 =item -m, --mailstatfile
```

111
112 Mail status file location. Defaults to /var/lib/filexfer/
 ↪ jobmonitor-mailstat.kch.
113
114 =item -o, --mailport
115
116 Port on which the mail server is listening for SMTP traffic.
 ↪ Defaults to 25.
117
118 =item -p, --pidfile
119
120 PID file name. This will be appended with a ".pid" suffix.
121
122 =item -r, --resource
123
124 Resource name of this application. Used in indicator and event
 ↪ messages sent to the NMS system.
125
126 =item --verbose, -v
127
128 Log to the screen at increasingly verbose levels. This option may
 ↪ be repeated
129 multiple times to increase the log level. For example, "-v" logs
 ↪ at info level,
130 "-vv" logs at debug level, and "-vvv" logs at trace level.
131
132 =back

filexfer-dataloader.plx — Data Loader

```

1  #!/usr/bin/perl
2
3  use strict;
4  use warnings;
5
6  use Modules::App::FileXfer::DataLoader ();
7  our $VERSION = $Modules::App::FileXfer::DataLoader::VERSION;
8
9  MAIN: {
10     # Process and merge command-line and config file options
11     my $getopt = Modules::App::FileXfer::DataLoader::
        ↪ get_command_line_options();
12     my $fileconf = Modules::App::FileXfer::DataLoader::
        ↪ read_config_file( $getopt->get_configfile );
13     Modules::App::FileXfer::DataLoader::merge_options( $getopt,
        ↪ $fileconf );
14
15     # Make sure we're the only instance running
16     Modules::App::FileXfer::DataLoader::check_pid_file(
17         $Modules::App::FileXfer::DataLoader::Options->{pidfile} );
18
19     # Get logger and evenge objects
20     Modules::App::FileXfer::DataLoader::create_evenge_obj();
21     my $logger = Modules::App::FileXfer::DataLoader::
        ↪ create_logger_obj(
22         $Modules::App::FileXfer::DataLoader::Options->{logger},
23         $Modules::App::FileXfer::DataLoader::Program
24     );
25
26     # Get the load jobs with pending files
27     my $dl = Modules::App::FileXfer::DataLoader::
        ↪ create_dataloader_obj();
28     my $jobs = Modules::App::FileXfer::DataLoader::get_load_jobs(
        ↪ $dl );
29
30     for my $job ( @{ $jobs } )
31     {
32         next if 414 == $job->idJob;
33         Log::Log4perl::MDC->put( 'idJob', $job->idJob );
34         $logger->info( sprintf( 'Executing job "%s".', $job->
        ↪ jobName ));
35

```

```

36     eval {
37         # Get the list of pending load files
38         my $files = Modules::App::FileXfer::DataLoader::
            ↪ list_load_files( $dl, $job );
39         next unless scalar @{ $files };
40
41         # Import the class for this job's files
42         Modules::App::FileXfer::DataLoader::import_file_class(
            ↪ $files->[0]->{fileclass} );
43
44         # Bulk load the data from each file
45         for my $file ( @{ $files } )
46         {
47             Modules::App::FileXfer::DataLoader::load_file_data
                ↪ ( $dl, $job, $file );
48             Modules::App::FileXfer::DataLoader::
                ↪ dequeue_load_file( $dl, $job, $file );
49         }
50     };
51
52     $@ and $logger->error( "$@" );
53
54     # Close the external db handle
55     $dl->close_ext_dbh();
56 }
57
58 $logger->info( 'Main application exiting.' );
59 exit;
60 }
61
62 __END__
63
64 =head1 NAME
65
66 filexfer-dataloader — Bulk load file data from filexfer into a
    ↪ database table.
67
68 =head1 VERSION
69
70 0.51
71
72 =head1 SYNOPSIS
73
74 filexfer-dataloader -c configfile [options]

```

```
75
76 =head1 ARGUMENTS
77
78 =over 4
79
80 =item -c, --configfile
81
82 Specify the configuration file to load. Must be in YAML format.
83
84 =back
85
86 =head1 OPTIONS
87
88 =over 4
89
90 =item -d, --piddir
91
92 Directory where the pid file will be written. Defaults to /var/run
    ↪ /filexfer.
93
94 =item --db
95
96 Sets the database connection parameters. Valid keys are: server (
    ↪ default
97 localhost), port (default 3306), driver (default mysql), uid, pwd,
    ↪ database,
98 and table. Specify tags as key/value pairs, e.g.:
99
100     --db server=localhost --db database=filexfer
101
102 =item -e, --evegehost
103
104 Address of the Evenge web server. Used to send indicators and
    ↪ events to the NMS system.
105
106 =item --evengetimeout
107
108 Timeout in seconds for communicating with the Evenge web server.
    ↪ Defaults to 10.
109
110 =item -f, --cachefile
111
112 Template cache file location. Defaults to /var/lib/filexfer/
    ↪ dataloader.kch.
```

```

113
114 =item -h, --help
115
116 Output this documentation.
117
118 =item -p, --pidfile
119
120 PID file name. This will be appended with a ".pid" suffix.
121
122 =item -r, --resource
123
124 Resource name of this application. Used in indicator and event
    ↪ messages sent to the NMS system.
125
126 =item --verbose, -v
127
128 Log to the screen at increasingly verbose levels. This option may
    ↪ be repeated
129 multiple times to increase the log level. For example, "-v" logs
    ↪ at info level,
130 "-vv" logs at debug level, and "-vvv" logs at trace level.
131
132 =back

```

[FIXME: Need data here]

Table 2 – FileXfer directories and files on prod-prov4-cdr1

Directory	File(s)
/etc/filexfer/	*.conf
/usr/bin/	filexfer-dataloader filexfer-dataloader.plx filexfer-dataloader.plx.mbak filexfer-epg-dataloader.plx filexfer-filearchive filexfer-filearchive.sh filexfer-fileunarchive filexfer-fileunarchive.sh filexfer-jobmonitor filexfer-jobmonitor.plx filexfer.plx
/usr/lib/filexfer/	*.gz, *.sh, *.plx ExtractCarrierTurboZoneUsage*
/usr/share/filexfer/	filexfer.changelog-*.xml
Continued on next page	

Table 2 – continued from previous page

Directory	File(s)
	filexfer.changelog-master.xml
	liquibase.sh
	.gnupg/pubring.gpg
	.gnupg/random_seed
/var/cache/yum/build/packages/	filexfer-0.52-1.el5.centos.noarch.rpm
/var/lib/filexfer/	dataloader.kch
	dataloader_temp.kch
	filexfer-aaa01-13-get.kch
	...
	filexfer-wps01-706-get.kch
	filexfer.kch
	jobmonitor-mailstat.kch
	jobmonitor.kch
/var/log/filexfer	*.log
	ExtractCarrierTurboZoneUsage_ACS.log
	archive
	convert-wps-om-counters-report-part2.log
	convert-wps-om-counters-report.log
	dataloader.log
	dataloader_temp.log
	dataloadinsert.log
	datarecovery.log
	epg-dataloader.log
	ericsson-oss-rl-reports-preprocess.log
	ericsson-oss-sts-reports-preprocess.log
	filearchive.log
	filexfer-aaa01-13-get.log
	filexfer-aaa01-14-put.log
	...
	/var/log/filexfer/filexfer-wps01-706-get.log

L^AT_EX - Examples and Formatting

Comments

COMMENTS Comment — *Sean Weems, Spring 2003*

We should get the COMMENTS column searchable via the landrecords application before we do much anything else – shouldn't be too hard.

Errata: Plats spanning multiple sections

A few anomalies can be observed in the AKPLATS table. Specifically plats exist that span multiple sections. Since the table only has a single column, SCODE, that accepts a single section code, SGU (Status Graphics Unit) has handled this problem by entering multiple rows in the table, each with a different section that point to the same plat or file. Multiple section plats are indicated by setting the TCODE column to the value 37, and making an appropriate notation like *Section 24-25-26-27* in the REMARKS column.

[FIXME: Perhaps the SCODE column should accept an array of sections?]

Links

A Guide to L^AT_EX

<http://www.astro.rug.nl/~kuijken/latex.html>

L^AT_EX - From Wikibooks, the open-content textbooks collection

<http://en.wikibooks.org/wiki/LaTeX>

L^AT_EX Notes

http://luke.breuer.com/time/item/LaTeX_Notes/180.aspx