EDpCloud Cross Platform File Replication and File Synchronization

Eden Prairie, April 29 2019

EDpCloud Manual Revision Sheet

Release No.	Date	Revision Description
Rev. 0	10/01/2008	User's Manual v 0
Rev. 1	11/10/2010	User manual v1
Rev. 2	12/10/2011	Revision 1: To Reflect all platforms
Rev. 3	09/10/2012	Support for EDpCloud new names
Rev. 4	15/09/2017	Revamp to add more UI and Linux examples
Rev. 5	19/10/2018	Add references to man pages/pdf, add more screen shots. Moved to document to word.
Rev. 6	8/3/2019	Document https port changes
Rev. 7	4/29/2019	Fixes to edlicense
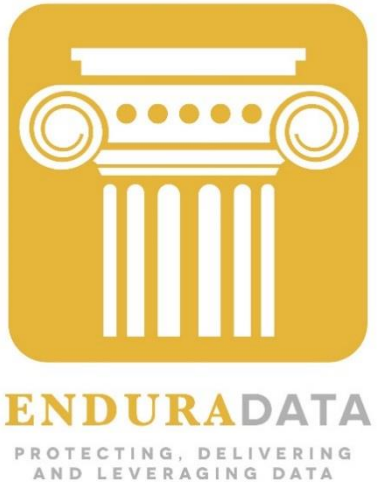
EnduraData™ EDpCloud™ User's Manual

Authorization Memorandum

I have carefully assessed the User's Manual for EnduraData EDpCloud. This document has been completed in accordance with the requirements.

MANAGEMENT CERTIFICATION - Please check the appropriate statement.

_x_____ The document is accepted.

_____ The document is accepted pending the changes noted.

_____ The document is not accepted.

We fully accept the changes as needed improvements and authorize initiation of work to proceed. Based on our authority and judgment, the continued operation of this system is authorized.

_____A. El Haddi_____ _____April/29/2019_____

NAME   DATE

Project Leader

Please report any errors, omissions or suggestions to: support@enduradata.com

EDpCloud USER'S MANUAL

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1.0 GENERAL INFORMATION

1. EnduraData EDpCloud™

1.1 System Overview

EDpCloud is a cross platform software suite. The software is used for data protection, data replication, and automated data movement between systems, operating systems, storage appliances, cloud providers and between remote national and international geographic locations.

The software can be configured and managed using either a command line interface (CLI), a web browser or both.

1.2 Supported Operating Systems

EDpCloud is available for the following operating systems:

- Linux on intel (32 and 64 bit) and on Power 7 and above (64 bit)
- Solaris x86
- Solaris Sparc
- Mac
- AIX
- OpenBSD 6.2 (32 bit and 64 bit)
- Windows7 32 bit & 64 bit
- Windows 8,10 32 bit & 64 bit
- Windows 2008 and 2012, 201632 bit and 64 bits.
- Windows XP 32 bit
- Windows 2003 32 bit
- Other platforms as requested.

All platforms support on demand and scheduled replication. Windows and Linux support on demand, scheduled and real time replication.

Please contact EnduraData if you need support for other Operating systems.

1.3   System requirements

The following are the minimum requirements to run EDpCloud™:

- 8 GB of RAM
- 2 GB of available disk space
- Network with TCP/IP
- Root or Administrator access or ability to mount file systems and use network ports
- Availability of network ports to communicate to remote or local backup systems.

1.4   EDpCloud information & software updates

Additional information about EDpCloud can be found at www.enduradata.com

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3. You agree to comply with all applicable export and import laws and regulations.

4. You agree to allow EnduraData, Inc or its successor to store and use your contact information for the purpose of providing you assistance, product updates, security alerts, support and billing. You

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7. You agree not to use EnduraData Inc. demo software to conduct any business without paying EnduraData for every copy used.

8. EnduraData Inc. Contact Information

EnduraData Inc.

6440 Flying Cloud drive

Suite 210

Eden Prairie, MN 55344

952-746-4160

support@enduradata.com

1.6   Points of Contact & Support Access Codes:

 Please write down the following information so it is handy for license renewal, updates and support:

These are the authorized people to manage EDpCloud in your company and they are authorized to contact EnduraData for support:

- Contract ID(s) required for support:

- Contact Name:

- Contact Email:

- Contact ID:

Additional authorized contacts:

- Contact Name:

- Contact Email:

- Contact ID:

1.6.1 Coordination

When deploying EDpCloud in large companies, with many nodes that span many countries, cities or data centers, it is important to keep some information very handy for coordination.

This is the list of all division contacts that may be affected by EDpCloud operation. This information and the level of coordination vary from company to company.

Coordination Contact list:

- Operations:
    - ○
- DevOps
    - ○
- System Admin:

o

- Network admin:

    o

- Storage and file system mangers:

    o

- Security and firewall managers:

- Other stake holders

1.6.2 EnduraData Help Desk & Contacts

- When you purchase support, EnduraData assigns an ID and emergency contact information to your organization. Use your emergency assigned phone number for your support contract.
    o 952-746-4160: General support routing number
    o [support@enduradata.com: General support](mailto:support@enduradata.com)
    o yourcontact@enduradata.com: specific support

1.7 Terminology, Acronyms and Abbreviations

We will use the following terms:

- **edlicense**: The license file you received after purchasing the software or the demo license
- **sender**: The host or computer that sends data to another computer
- **receiver**: A destination computer that receives data from another computer (sender). A server or node can be both a sender and a receiver. The receiver can also be a local machine
- **link**: A short character name to identify the logical association between one sender and one or many receivers. This is also known as a replication set. Each link has only one sender
- **storepath**: The path where the receiver will store any data received from a sender. Each link or sender may have a different or the same path
- **journal**: A database that keeps track of replication activity

- **statdb**: A database that keeps track of the status of replication and its history
- **basedir**: The path where you installed EDpCloud. This is the top directory. Under Linux/Mac/Unix the default is /usr/local/enduradata/edpcloud. Under Windows, the default basedir is c:\enduradata\edpcloud
- **archivedir**: A directory where archives of modified or deleted files are located
- **etcdir**: A directory where configuration files are located:
  This is $edpcloud/etc under UNIX and %ED_BASE_DIR\etc under Windows
- **$edpcloud**: An environment variable that represents edpcloud basedir under Linux/Unix/Mac
- **$ED_BASE_DIR**: an environment variable like $edpcloud under Linux/Mac/Unix
- **%ED_BASE_DIR%**: an environment variable for basedir under Windows
- **Unidirectional replication**: Replication from one place to one or more
- **Bi-directional replication**: replication back and forth between two hosts
- **One to many**: replicating from one server to many servers
- **Many to one**: replication from many servers to one
- **Cascaded replication**: replicating from one to many and then to others.

Please read the eddist.cfg manual page for more information.

1.8   List of commands and utilities

- ***edstat***: Shows status of replication
- ***edq***: Queue jobs for replication
- **edmfq**: A more advanced queuing of files for synchronization. This also shows modified files between time periods.
- ***edjob***: List of jobs that have run so far and their execution times, cancel jobs, manage job priorities …
- ***edpause***: Pause replication
- ***edresume***: Resume replication
- ***edpcloud.sh startall*** : Start EDpCloud under Linux/Unix
- **edpcloud.sh stopall**: Stop EDpCloud under Linux/Unix
- ***edstart***: Start all EDpCloud services under Windows command line
- ***edstopall***: Stop all EDpCloud services under Windows command line.

1.9   List of configuration files

All configuration files are located under:

- $edpcloud/etc for Linux and Unix

- %ED_BASE_DIR%\etc for Windows

The following are some of the core configuration files:

- eddist.cfg: The core file replication file which lists the links/resets, the senders, the receivers and various parameters

- edpassword: Management password

- edfsmonitor.cfg: Real time file replication which lists the directories to monitor in real time

- trace: log levels.

We will see more details in the next sections.

2.0   SYSTEM SUMMARY

2. EDpCloud SUITE SUMMARY

EDpCloud is a software suite that, when installed and configured on a computer, synchronizes data between one or more systems located in one or more locations or clouds.

2.1 EDpCloud Uses

You can use EDpCloud for the following:

- Data protection
- Automated data distribution
- Automated data aggregation
- Automated replication and backup
- Mirror data between systems
- Workflow automation
- Data synchronization between clouds
- Data migration between systems, locations and clouds
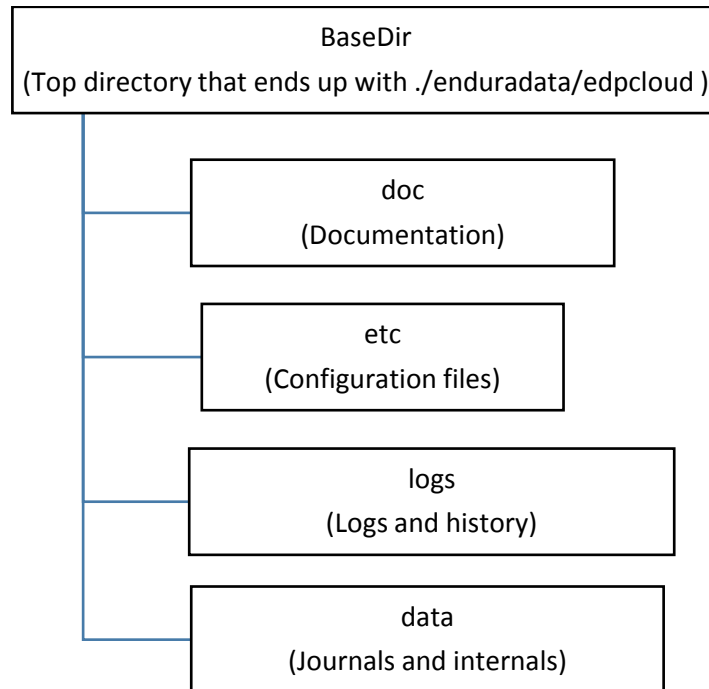- Automated data delivery on demand.

2.2 EDpCloud operating modes

EDpCloud has multiple operating modes:

- Real Time for Linux and for Windows (Any file changes that take place are sent to one or more remote locations
- Scheduled: You create a schedule and data is synced at a pre-determined time and date
- On Demand and Ad hoc: Data is synchronized as needed

You can combine all of these three modes to create a synchronization process that suites your needs.

2.2 Directory structure

```
┌─────────────────────────────────────────────────────┐
│                    BaseDir                           │
│ (Top directory that ends up with ./enduradata/edpcloud ) │
└─────────────────────────────────────────────────────┘
        │
        │       ┌─────────────────────────────────┐
        │       │              doc                │
        ├───────│        (Documentation)          │
        │       └─────────────────────────────────┘
        │
        │       ┌─────────────────────────────────┐
        │       │              etc                │
        ├───────│       (Configuration files)     │
        │       └─────────────────────────────────┘
        │
        │   ┌─────────────────────────────────┐
        │   │              logs               │
        ├───│        (Logs and history)       │
        │   └─────────────────────────────────┘
        │
        │   ┌─────────────────────────────────┐
        │   │              data               │
        └───│      (Journals and internals)   │
            └─────────────────────────────────┘
```

2.3 System Configuration Files

EDpCloud configuration files are located in etc subdirectory of EDpCloud basedir, where basedir is the directory where EDpCloud was installed.

Basedir has several sub directories. The etc directory contains the following configurations that can be edited using a browser (using https) or a plain text editor (vi for Linux/Mac/Unix or notepad for Windows for example):

- **eddist.cfg:** This is the main configuration file that defines the links (replication sets). It should have at least one link with a sender and a receiver. It can have more than one link.
  Each link has only one sender and one or more receivers. Although you can have multiple receivers per link, it is better to create a separate link for each receiver.

This configuration file must exist on both the sender and on the receiver. The link section on the source must have a matching link section on the sender. It is best to configure on one machine and drop eddist.cfg on the remote machine.

- **includes:** This file if it exists (it is optional), restricts the file patterns that can be replicated. If it does not exist or if it is empty, everything will be "considered" for replication if it is not in the excludes list. The sender and the receiver can have different include patterns to control what can be sent and what can be received.
- **excludes:** This file if it exists, has a list of file and directory patterns that are excluded from replication. If it does not exist, then nothing will be excluded from replication. The excludes can be different between the sender and the receiver

  Both the includes and excludes use POSIX regular expressions to match directory and file name patterns to include or to exclude from replication.

  To be included, a file or directory pattern must match the includes and must not match the excludes. We refer to these as regex patterns.

- **edfsmonitor.cfg:** This file controls what can be replicated in real time. It consists of one directory name per line. The content of edfsmonitor.cfg cannot be regular expressions. It must be a list of absolute path names of existing directories
- **edscheduler.cfg:** This file has a list of tasks to execute on a regular schedule.
- **trace**: This file contains a list of characters and numbers that control the log levels.
- **edpasswd**: A password used to control access to replication commands and management.

2.4 Logs and History Files

EDpCloud generates log and history files that are used to track EDpCloud replication progress, failures and history of the file synchronization. These files are located in the logs subdirectory of EDpCloud basedir. The logs and history files get compressed when they exceed a certain size. This threshold size can be changed in enduradata_env (Linux) or in the registry or a batch file (Windows). Compressed files have ".edz" as an extension. Compressed files can be decompressed using edzdump utility which is part of EDpCloud software suite.

 The following are some examples of the logs and history files:

- **eddist.log:** This file contains information about replication errors and progress. Its compressed counterparts are named eddist.log.1.edz ... eddist.log.nn.edz

- ***ed_sender_L_linkname_R_receivername.log:*** This is the log of the sender side for the particular link and receiver
- ***ed_receiver.log:*** This is the log for the receiver. This has the information & generic errors
- ***ed_receiver_L_link_R_receiver.log:*** This has specific errors for a link and a receiver
- ***history_sender*log***: this has the history of files sent by the sender. Each sender has its own log.
- ***history_receiver.log:*** this log file has information about all files received by the receiver for all links and all senders
- ***wafs*log:*** this is the log for a particular file system monitored in real time under Linux
- ***edfsmonitor*log:*** this is the log file for file system change monitor.

Additional history is kept in statdb database located under the data subdirectory. This file uses SQLite. Use edjdb to examine the file. statdb continues to grow until it is zeroed or removed. Do not remove this file unless there are not files in the journal. Statdb can be removed only after EDpCloud is stopped and there are no pending jobs.

2.5   EDpCloud File Permissions and File Ownership

Since EDpCloud needs to monitor all file systems activity for all users. It is important that EDpCloud file permissions are restricted to the system administrator. The permissions should allow only the super user/Administrator to read, write and execute. Others should be denied access. The installer takes care of this. Please ensure this does not change without intent.

2.6 Immediately after you install

If you plan to use a different port for the web GUI, do the following immediately after you install on each machine:

1) edit nginx.conf to change the port number (change the listen parameter)
2) edit edguiports under edpcloud etc directory to add the https ports for each host that you will use
   example:
   localhost:8080
   Restart services.

2.7 How does EDpCloud work?

EDpCloud has the following main subcomponents

- A real time file system monitor (edfsmonitor for Windows and eduwfs for Linux). It monitors all file operations (writes, renames, ownership change, permissions, …)
- A transport layer (ed_sender, ed_receiver) which is responsible for all data communications and file storage management
- An orchestrator and super manager process (eddist) responsible for:
    - Journaling file changes
    - Coordinating the transport layer (ed_sender and ed_receiver)
    - History log manager
    - Authenticators
- EDpCloud I/O analytics and machine learning modules
- EDpCloud super systems monitors (eddistd, edrcvrd)
- A scheduler responsible for scheduling tasks (edscheduler)
- Command line tools used to manage replication

EDpCloud journals files first then sends them to the receiver(s). In case of a network failure or any other errors the system will keep retrying until a maximum retry limit is reached or the file transfer and synchronization succeeds. In the case of Windows, if a file is locked then a VSS snapshot is used to deal with open files.

If a file is modified during a previous transit, it is resynchronized.

EDpCloud sends only deltas (portion of file changes) but can also be configured to resend entire files. EDpCloud uses adaptive compression to reduce the amount of data sent over the network. By default, the communications between the sender and the receiver are encrypted using AES128. This behavior can be changed (see eddist.cfg manual page). Files can remain encrypted at rest as well (however beware that EnduraData cannot help anyone to decrypt data if keys are lost. So keep your keys somewhere safe).

3.0   INSTALLATION FOR LINUX/UNIX

3. INSTALL AND CONFIGURE FOR LINUX/MAC/UNIX

Before starting the installation and configuration:

a. Download a copy of EDpCloud
b. Get a license file (Demo licenses are free and must be downloaded).

Paying customers must contact EnduraData to get a permanent license.

3.1 Downloading EDpCloud

a. Verify your operating system and make sure it supports 32 bit or 64 bit programs and the package bits matches your machine and OS architecture.
b. Browse to www.enduradata.com
c. Register and download the software, paying attention to the OS and the OS bits in the file name(x86 for 32 bits and x64 for 64 bits on Intel). Use uname –a to figure out if your OS is a 32 bit or a 64 bit.

   Example:
   - *edpcloud_LINUX_x64_v4_3_8_E.tar.gz is for 64 bit (x64)*
   - *edpcloud_LINUX_x86_v4_3_8_E.tar.gz is for 32 bit (x86)*

d. Download the package
e. Download a temporary license file

3.2 Installing EDpCloud for Linux/Mac/Unix

In this section we will assume that you are downloading version 4.3.8 of EDpCloud for Linux 64 bit running on Intel.

Therefore we assume that you downloaded two files:
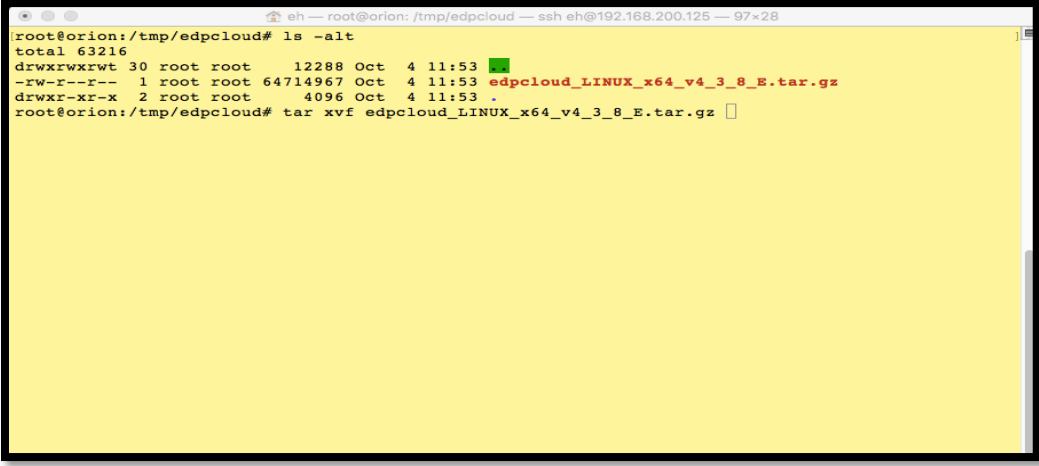
   - *edpcloud_LINUX_x64_v4_3_8_E.tar.gz*

- *edlicense.gz*

We will also assume that you installed edpcloud **in: */usr/local/enduradata***

- Verify the md5 for the files
- Extract the file content and install:

> *tar xvzf edpcloud_LINUX_x64_v4_3_8_E.tar.gz*
> *cd enduradata_edpcloud*
> *./install.sh*

```
root@orion:/tmp/edpcloud# ls -alt
total 63216
drwxrwxrwt 30 root root    12288 Oct  4 11:53 ..
-rw-r--r--  1 root root 64714967 Oct  4 11:53 edpcloud_LINUX_x64_v4_3_8_E.tar.gz
drwxr-xr-x  2 root root     4096 Oct  4 11:53 .
root@orion:/tmp/edpcloud# tar xvf edpcloud_LINUX_x64_v4_3_8_E.tar.gz
```

- Read the license agreement (hit q to quit)
- Press Y when prompted to accept as shown below

  For the rest, accept the defaults or change them as needed

```
● ● ●                 ⌂ eh — root@orion: /tmp/edpcloud/enduradata_edpcloud — ssh eh@192.168.200.125 — 113×40
Accept the entire agreement [YES/NO] :    yes

 Configuring ...

 ***********************************************************
  Installing EnduraData content distribution.
  Please enter the top directory name only. We will append edpcloud to the path get ED_BASE_DIR
 ***********************************************************
Enter install path name  [/usr/local/enduradata] :
/ /tmp/edpcloud/enduradata_edpcloud
/tmp/edpcloud/enduradata_edpcloud
 Fixing environment scripts ...
Using ED_BASE_DIR = /usr/local/enduradata/edpcloud
Making directory  /usr/local/enduradata/edpcloud ...
Copying content of edpcloud
Verifying EDpCLOUD directory structure ...
Management port:  [9000] :
Content receiver port:  [8888] :
Run the WEB/browser based GUI. (y|n):  [Y] :
Start running the services now. (y|n):  [Y] :
Installing to /usr/local/enduradata...
Enter management password  [\*] :
Enter expression for allowed host patterns [\*] :
creating /usr/local/enduradata/edpcloud/etc/edpasswd
 Editing startup scripts ...
 Editing /usr/local/enduradata/edpcloud/bin/edpcloud.sh
 Relocating /usr/local/enduradata/edpcloud/bin/edpcloud.sh.tmp
 Checking for auto start ...
/ /tmp/edpcloud/enduradata_edpcloud
/tmp/edpcloud/enduradata_edpcloud
Creating SysV type startup script
/ /tmp/edpcloud/enduradata_edpcloud
/tmp/edpcloud/enduradata_edpcloud
Building env /usr/local/enduradata/edpcloud/tmp/enduradata_env.tmp ...
Building /usr/local/enduradata/edpcloud/tmp/enduradata_startcd ...
Installation complete.
Now cd to /usr/local/enduradata/edpcloud/etc and create eddist.cfg, get a valid license
To have a good demo free to call EnduraData or email support. Will be glad to help.
------------------------------------------------
Thu Oct  4 12:08:38 CDT 2018
```

Once the installation is finished source in the environment (Notice the dot!!!):

> *. /usr/local/enduradata/edpcloud/bin/enduradata_env*

Once you source in the environment, you now have access to some shortcuts:

- $edpcloud: this is the base dir
- $ED_BASE_DIR: this is another basedir (historical)
- Man pages
- Documentation under $edpcloud/doc

3.3 Configuring EDpCloud using a command line editor

All configuration files are located under $edpcloud/etc (In our case here:

/usr/local/enduradata/edpcloud/etc.)

We will create a simple configuration that replicates from localhost to a host called orion:

3.3.1 Configure eddist.cfg

- *cd $edpcloud/etc*
- *Use vi eddist.cfg to edit the file. Enter the following content:*

```
1    <?xml version="1.0" encoding="UTF-8"?>

2    <config name="enduradata" password="1234" >

3     <link name="linoffice" isrealtime="1">

4            <sender hostname="localhost" alias="*" />

5                 <receiver hostname="orion" storepath="/backup/linux1"  />

6    </link>

7    </config>
```

The configuration above replicates from any localhost to orion and puts the data on host orion:/home/edpcloud_data.

The following is another example of any localhost replicating to a host orion and piling data in /backup/linux1. Line numbers are shown on the left for annotation purposes:

- Line 1: A string to show XML version and encoding. Do not change this line.
- Line 2: A configuration name and a password. Change the configuration name and password
- Line 3: Link name, and if real time set to 1.
- Line 4: Sender hostname. In this case the sender is localhost but the alias="*" can make it match any other host. Leaving us with a password and link name only for authentication.
- Line 5: Receiver hostname and the path where data will be stored
- Line 6: is a termination tag for the link section
- Line 7: is a termination tag for the configuration section

The following is another example replicating from a machine called Tokyo to another called London. Notice how we dropped the alias. Hence it will match only Tokyo as a sender. Any others will fail.

This configuration will thus run only if the hostname matches Tokyo(sender) and london(receiver).

Incoming data from Tokyo has been configured to be stored under **/data/incoming/tokyo**

```
<?xml version="1.0" encoding="UTF-8"?>

<config name="enduradata" password="1234" >

 <link name="linoffice" isrealtime="1">

     <sender hostname="tokyo"  />
     <receiver hostname="london" storepath="/data/incoming/tokyo"  />

 </link>

</config>
```

Create and save the file in eddist.cfg
Run the following to verify eddist.cfg:

edverify

See the manual page eddist.cfg or the html page called eddist.cfg.html for more information about other parameters.

Now that you have configured replication you need to create the store path (You can have the system do that automatically by editing $edpcloud/bin/enduradata_env

You will need to configure the sender and the receiver. Do not configure the real time on the receiver unless you want it to replicate somewhere else (cascaded replication).

After editing eddist.cfg, run edpcloud.sh startall (Linux and UNIX)

 DO NOT ATTEMPT TO CREATE BI-DIRECTIONAL REPLICATION UNTIL YOU BECOME VERY FAMILIAR WITH EDPCLOUD (OTHER WISE YOU MAY CHANGE SYSTEM FILES!)

3.3.2 edpasswd: Management password

edpasswd controls management. The format of the file is:
hostname:password

edpasswd entries on the sender must match entries on the receiver.

Example:

: allows you to manage it from any host without a password.

Example:

192.168.200.*:foo   all hosts on the 192.168.200 network can manage by providing foo as a password.

So let's create $edpcloud/etc/edpasswd and put in it:

localhost:foo

The above line will match localhost only. "foo" must be supplied as a password

EDpCloud commands consults $edpcloud/etc/edpasswd if no password is supplied. All services consult edpasswd and other configurations.

3.3.3 edfsmonitor.cfg: Real time configuration

edfsmonitor.cfg consists of one directory name per line. As of version 4.3.8, EDpCloud supports real time only for Windows and Linux.

Example: cat $edpcloud/etc/edfsmonitor.cfg

> /home
>
> /data1
>
> /data2

Every file and subdirectory under /home, /data1 and /data2 (and their sub … sub directories and their contents) will be monitored in real time. Any file changes (creates, renames, writes, symlinks, chmod, chown, etc) that take place on the localhost under /home, /data1 or /data2 will be propagated to the remote receiver.

Remember to restart EDpCloud: edpcloud.sh startall

3.3.4 includes: What to include in replication

$edpcloud/includes contains the regular expressions. Multiple expressions can be assembled in one line or in multiple lines. Expressions for each line are "ored" together.

By default includes does not exist. If the includes file does not exist or is empty, EDpCloud assumes the includes contains ".*" which means everything is included.

> a. ***Example 1 of an includes file:***

(^/home/.*)|(^/data1/.*)|(^/data2/.*)

> b. ***Example 2 of an includes file:***

^/home/data1/.*

^/home/data2/.*

^/home/parts/.*

There are multiple ways to specify other file names or inline expressions. Check eddist.cfg syntax.

3.3.5 excludes: What to exclude from replication

$edpcloud/excludes has the same format as $edpcloud/includes. However any file that matches the regular expressions specified in excludes will not get replicated.

The sender and receiver(s) may create different includes and excludes. So even if the sender allows a file to be replicated, the receiver must also allow it to be replicated.

A file or directory will get replicated only if it matches the includes and does not match the excludes.

Example of an "excludes" file:

.*core$

.*\.tmp$

.*\.log$

The previous regular expressions will exclude any file or directory name that ends up with core, any file or directory name that ends up with ".tmp" and any file or directory name that ends up with ".log"

3.3.6 Install a new license file

Copy your new demo or permanent license to $edpcloud/etc

Verify that the license is valid by running:

ed_is_license_valid $edpcloud/etc/edlicense eddist

3.4   Starting EDpCloud

Once you are done creating the configurations on both the sender and on the receiver you can start EDpCloud services on both the sender and receiver by running the following on each machine:

$edpcloud/bin/edpcloud.sh startall

3.5   Stopping EDpCloud

To stop Edpcloud:

$edpcloud/bin/edpcloud.sh stopall

3.6 To start EDpCloud automatically after a reboot

To start EDpCloud at boot time:

cd $edpcloud/autostart

Run the auto start script for your operating system.

For example, Linux users should run sys5debian_autostart.

3.7 Verify EDpCloud status

After starting EDpCloud, you can verify that it is running on the sender side by typing:

edstat

edstat runs only if the server is a sender. You should see something similar to the following figure:

```
● ● ●            eh — root@orion: /usr/local/enduradata/edpcloud/bin — ssh eh@192.168.200.125 — 91×33
root@orion:/usr/local/enduradata/edpcloud/bin# edstat
_____
        Thu Oct  4 16:11:11 2018 edpcloud v(4_3_8)
        Information for link lorion
*********************************************|**********************************************
Variable                                     | Value
*********************************************|**********************************************
 Sender name                                 | localhost
 Receiver                                     | orion | IsScheduled(Yes) | IsRealtime(Yes)
 Receiver Storage Path                        | "/home/edpcloud_data"
 Link status                                  | Running
 Alternate receiver name                      | alt not used
 Number of files in journal (EMPTY)           |         0
 Number of files in transit                   |         0
 Number of files with failures                |         0
 Number of  files with zero failures          |         0
 Total size of all files(Bytes)               |         0
 Size of files in transit(Bytes)              |         0
 Size of files NOT in transit(Bytes)          |         0
 Update avg transfer rate(BPS)                |         0
 Estimated time to finish (eta)               |    0h:00m:00s
_____
        Thu Oct  4 16:11:11 2018 edpcloud(4_3_8)
        Current active jobs for lorion receiver orion
*****|********************|********************|********************|********************
**|********************|********************************
Jobid| Link              | Receiver           | start              | last
  | T(sec)               | Path
*****|********************|********************|********************|********************
**|********************|********************************

Thu Oct  4 16:11:11 2018 : Took 0.007517 seconds
root@orion:/usr/local/enduradata/edpcloud/bin# ▊
```

3.8   Troubleshooting on the sender side

If edstat fails, it is highly likely that you have one of the following issues:

- An error in the configuration
- An invalid or expired license
- A mismatch between the binaries installed and the architecture (i.e installed 64 bit package on a 32 bit OS)

In case of a failure we will need to proceed as follows:

- Examine $edpcloud/logs/eddist.log
- Run edverify to make sure eddist.cfg does not have any errors.

- ***ed_is_license_valid $edpcloud/etc/edlicense eddist***

3.9 Troubleshooting on the receiver side

The following are some of the issues that may cause the receiver to fail:

- Invalid, expired or missing $edpcloud/etc/delicense
- Missing storepath
- Errors or wrong key terms in $edpcloud/etc/eddist.cfg
- Non resolvable sender address
- Non authorized sender address
- Mismach of passwords in eddist.cfg or edpasswd
- Make sure you can ping the receiver from the sender

Please use the following to fix the errors

- Examine $edpcloud/logs/ed_receiver*log
- Run ***edverify*** to make sure that eddist.cfg is correct
- Verify that the license is valid using: ***ed_is_license_valid $edpcloud/etc/edlicense eddist***
- Make sure you can ping the sender from the receiver.

3.10 Using the GUI with Linux and UNIX

Please see UI in the Windows configuration section. The only thing different are the pathnames.

4.0   INSTALLATION FOR WINDOWS

4. INSTALL AND CONFIGURE FOR WINDOWS

Before starting the installation and configuration:

a. Download a copy of EDpCloud for windows
b. Download a demo license (Beware that some firewalls may rename the file or zip it). Make sure the file is called delicense and is unzipped and is in edpcloud\etc directory.

Paying customers must contact EnduraData to get a permanent license.

4.1 Download EDpCloud Software for Windows

- Browse to www.enduradata.com/downloads

- Register for downloads

- Then download the package for your windows OS, paying attention to both the OS and the whether your OS is 32 or 64 bits.

Once you have downloaded the package follow these steps to install. The yellow markings on various items show where you need to click or enter required inputs.

4.2   Install

4.2.1   Double click to unzip
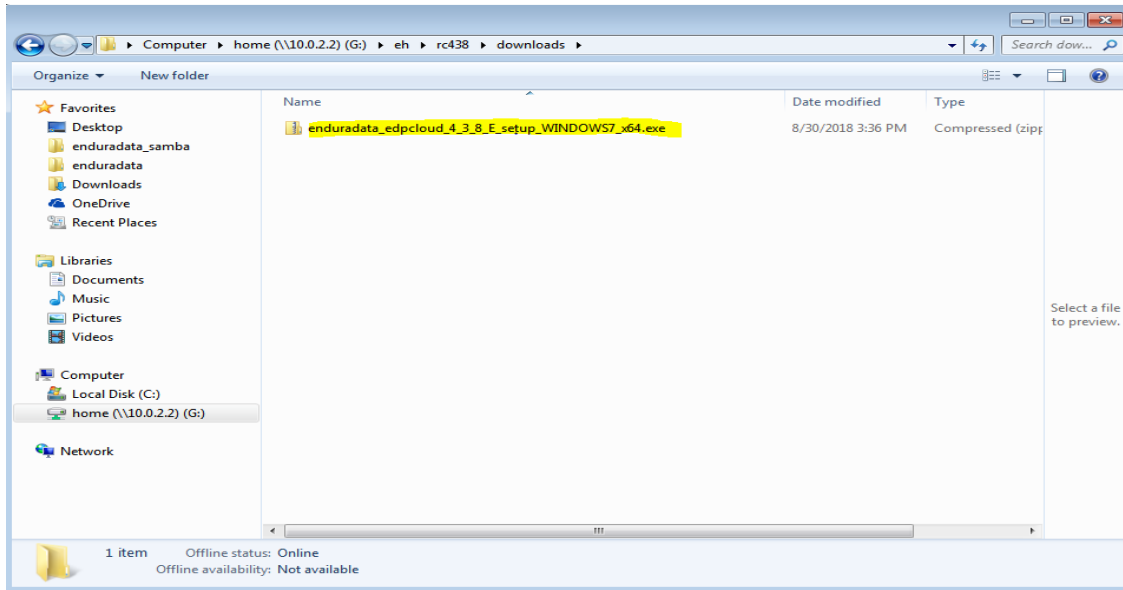
4.2.2   Double click to run the installer
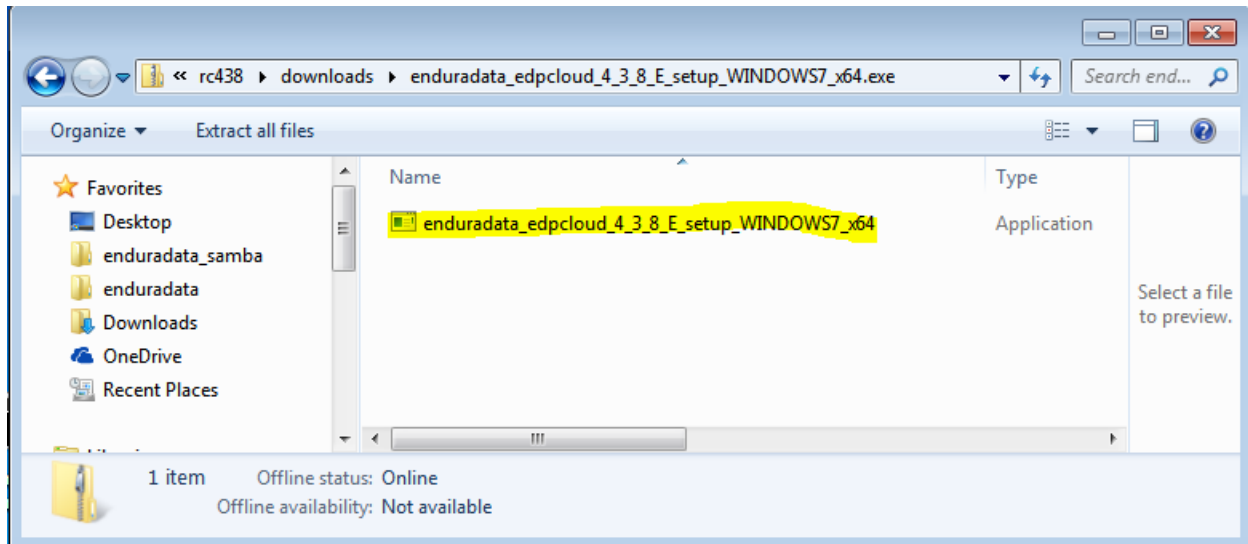
4.2.3 Click "ok" to start the installation
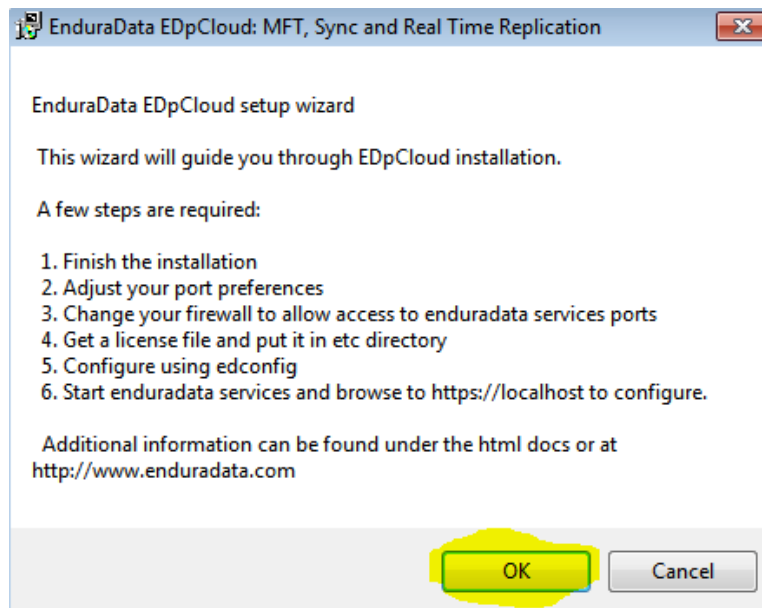
4.2.4   Enter the installation path and hit Next

Do not use spaces in the directory name. We suggest using the default.
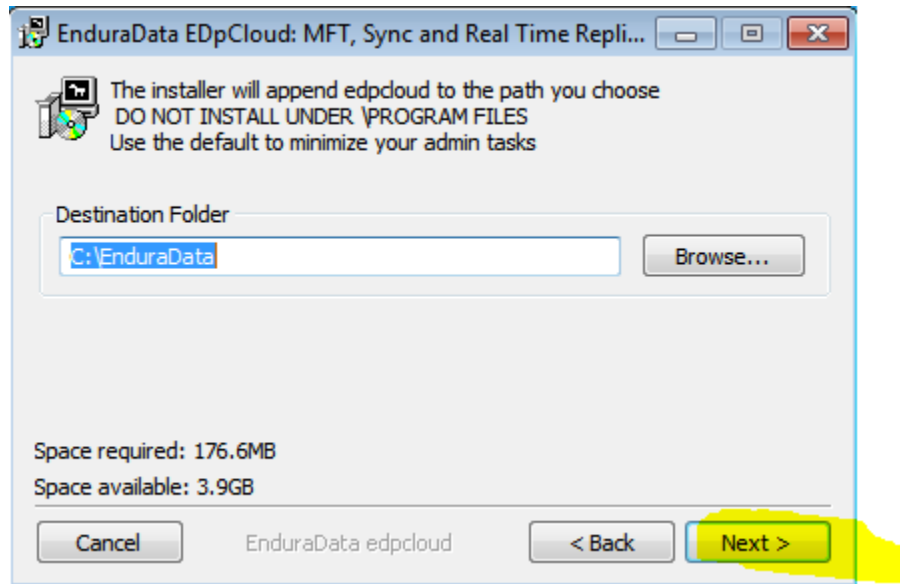
4.2.5 Read and press "I Agree" accept the license agreement
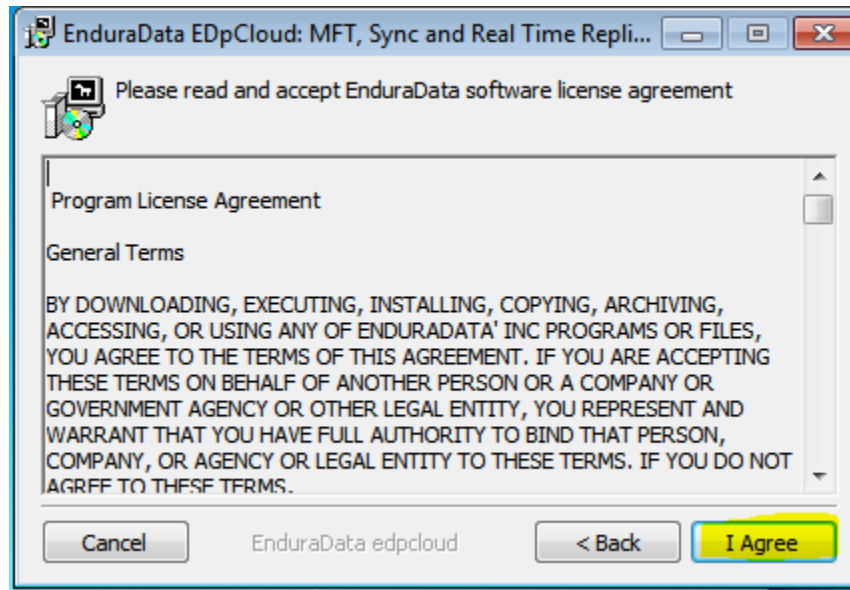
4.2.6 Press "Install"
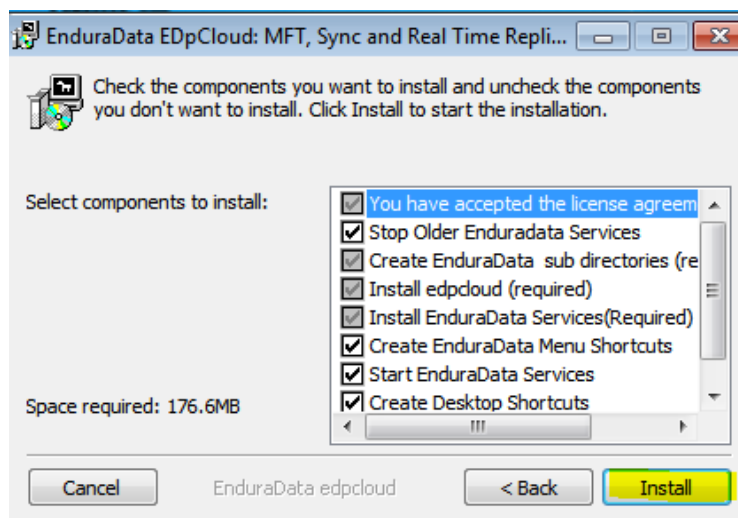
After you press install, you will see a series of windows opening, executing various parts of the installation and closing. Wait until you see the "close" to do anything.

4.2.7 Press "Close" when the installation is done
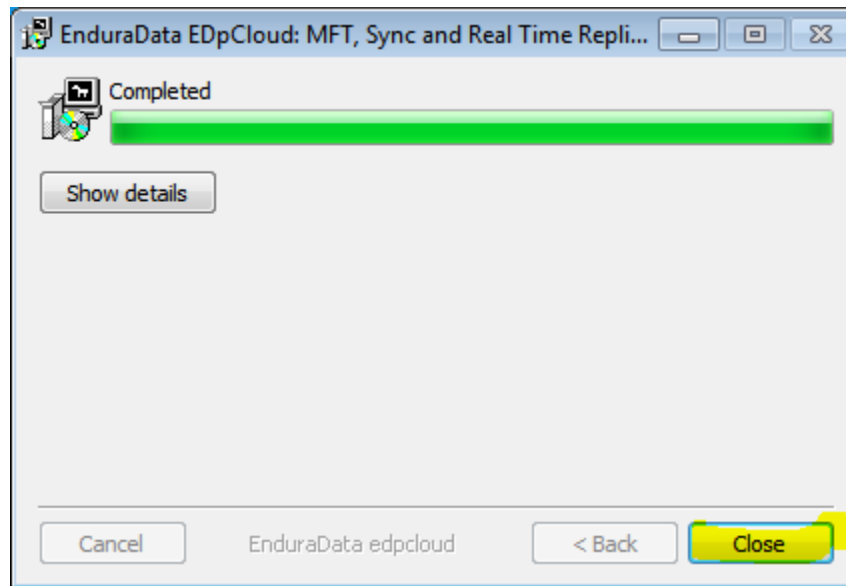
You will see a series of configuring services, wait for them to finish and to close.

4.2.8 Browse to the host using https://hostname

Browse to the hostname or IP address (localhost if you are on the host itself) using the chrome or Firefox browser.
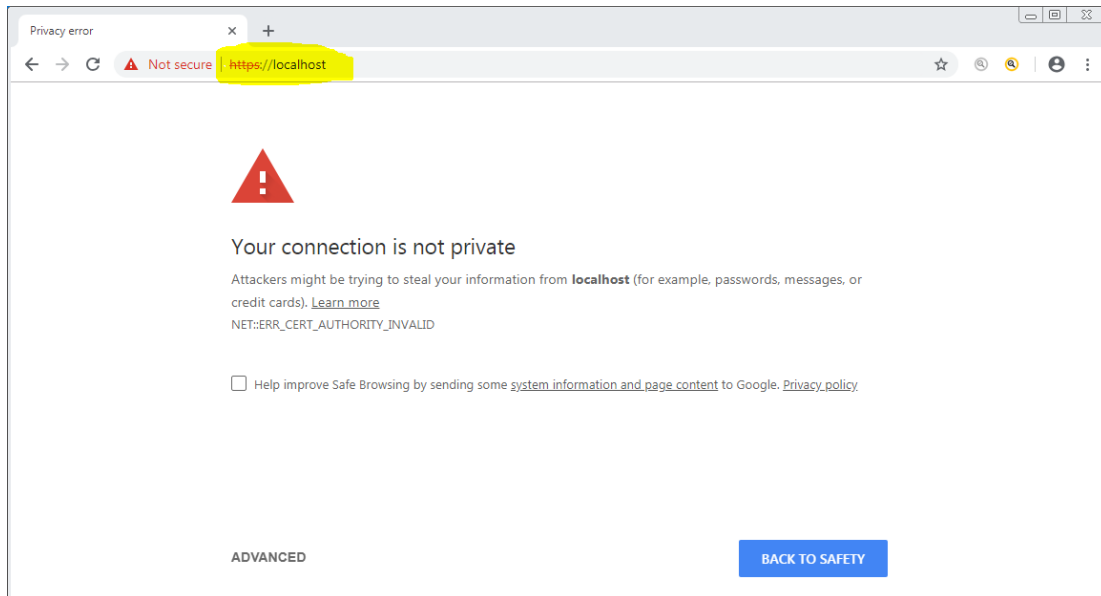
Because the certificate that shipped with EnduraData is self-signed you will see the warning that your connection is not private. You can replace the certificate later. You may see a different message depending on the browser that you are using.

4.2.9 Press "Advanced" or other Key to proceed
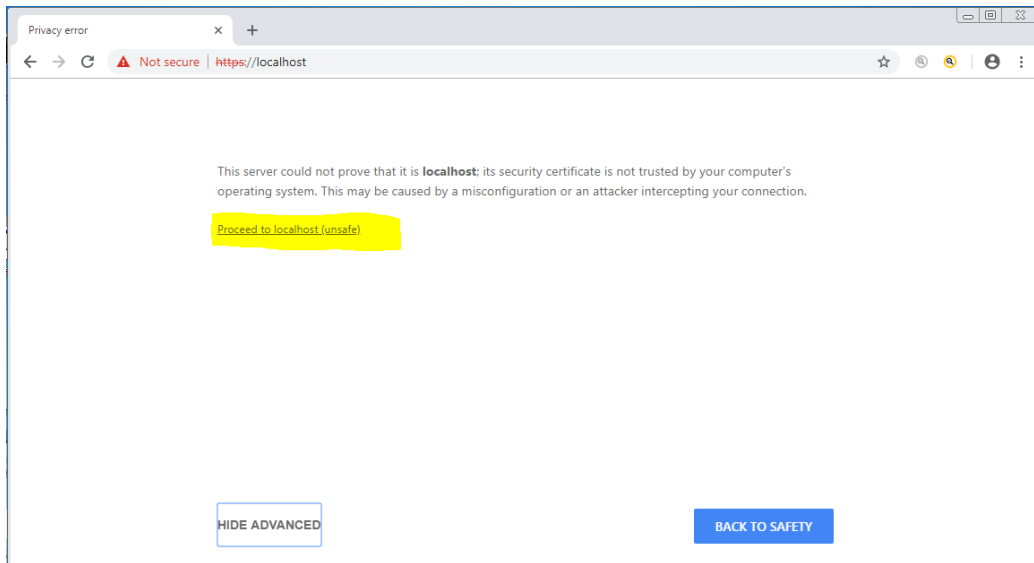
4.2.10 Click "OK"

You will need to change the default password immediately.
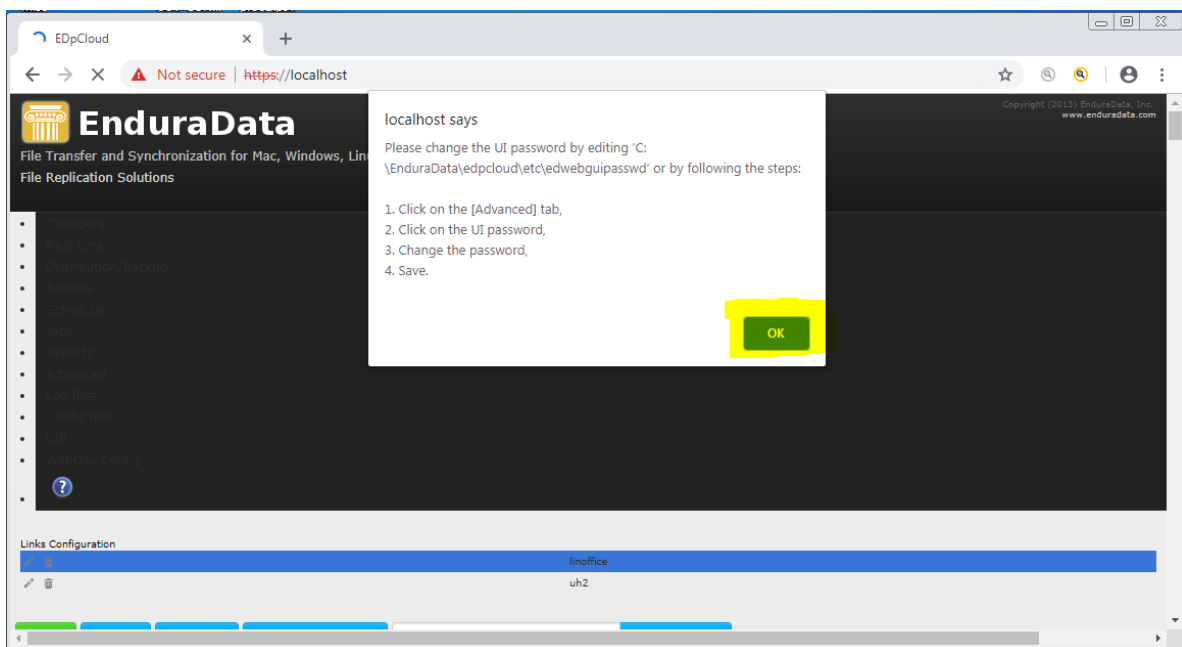
4.2.11 Click "Advanced" to change the UI/GUI password
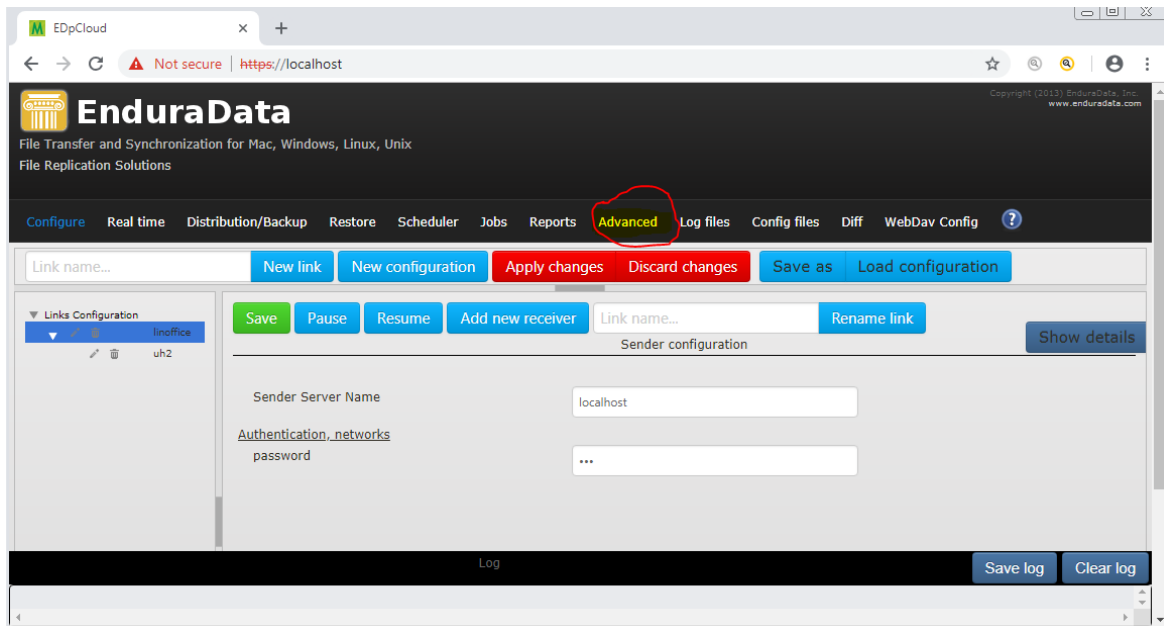
4.2.12 "UI password"
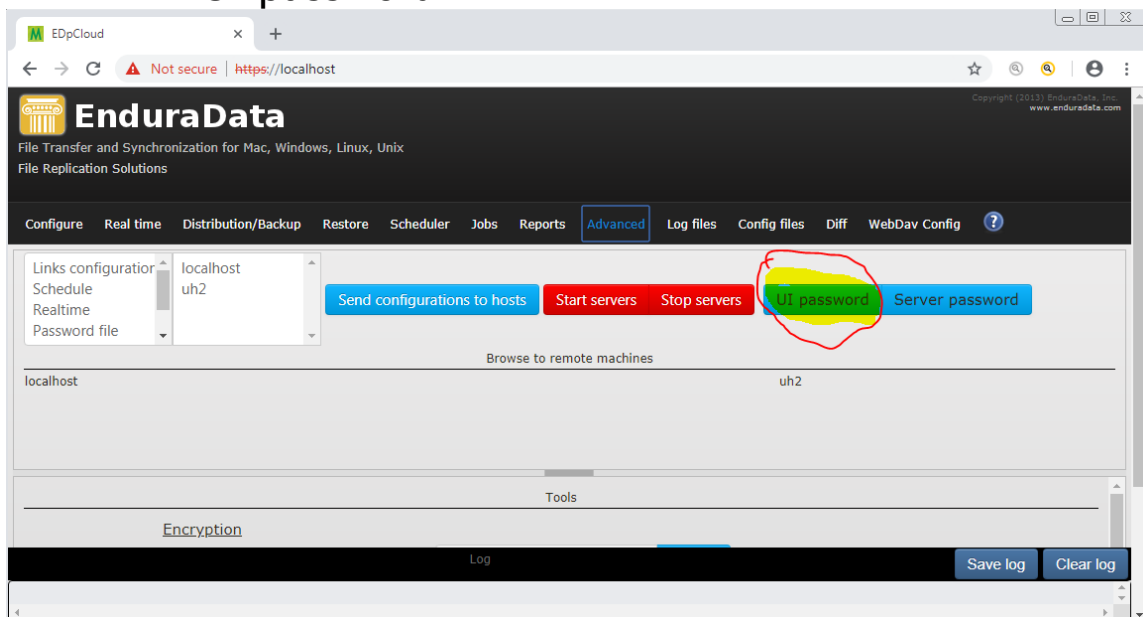
4.2.13 Enter a new password in the field and press "Save"
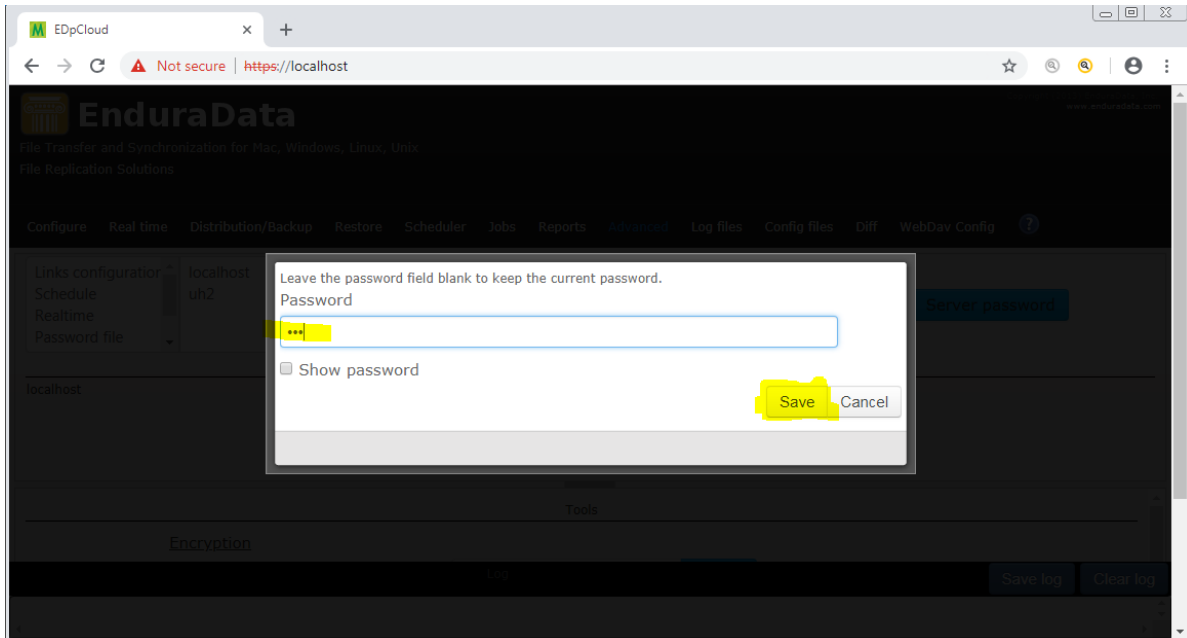
You are done with the installation for this machine.

Repeat the installation steps on other servers and start the configuration or copy the configuration to the destinations/receiver.

4.3 Configuring EDpCloud replication

During this step we will configure the localhost to replicate data to a remote machine called orion (IP 192.168.200.125). You can use hostnames or the IP addresses. Please make sure that you can ping the hostname and addresses from each other first. If you cannot, do not proceed until you make sure the two hosts can communicate between each other.

4.3.1 Change management password (edpasswd)

edpasswd file contains the list of hosts that can manage replication and the password.

Having a star (*) for the hostname allows you to configure from any host.

Having a * for a password allows authorized hosts to manage without a password.
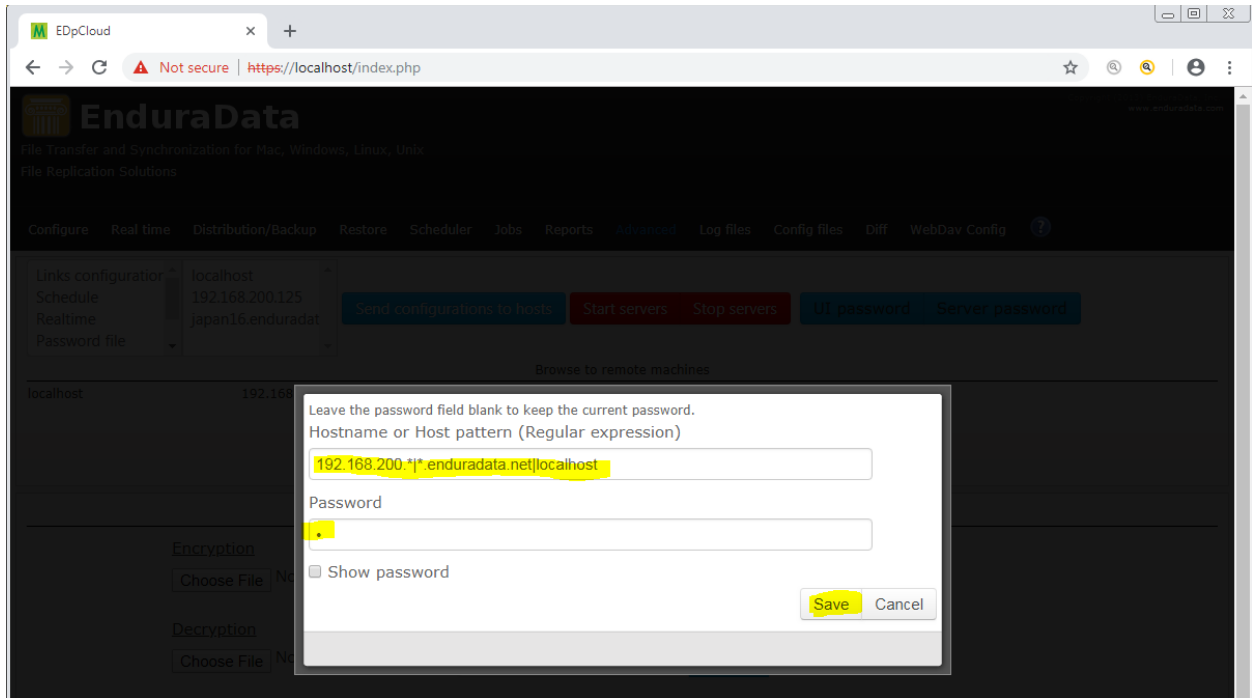
Separate the list of hosts with a pipe (vertical bar) "|"

Click "Save" when done.

4.3.2 Click on "Configure"
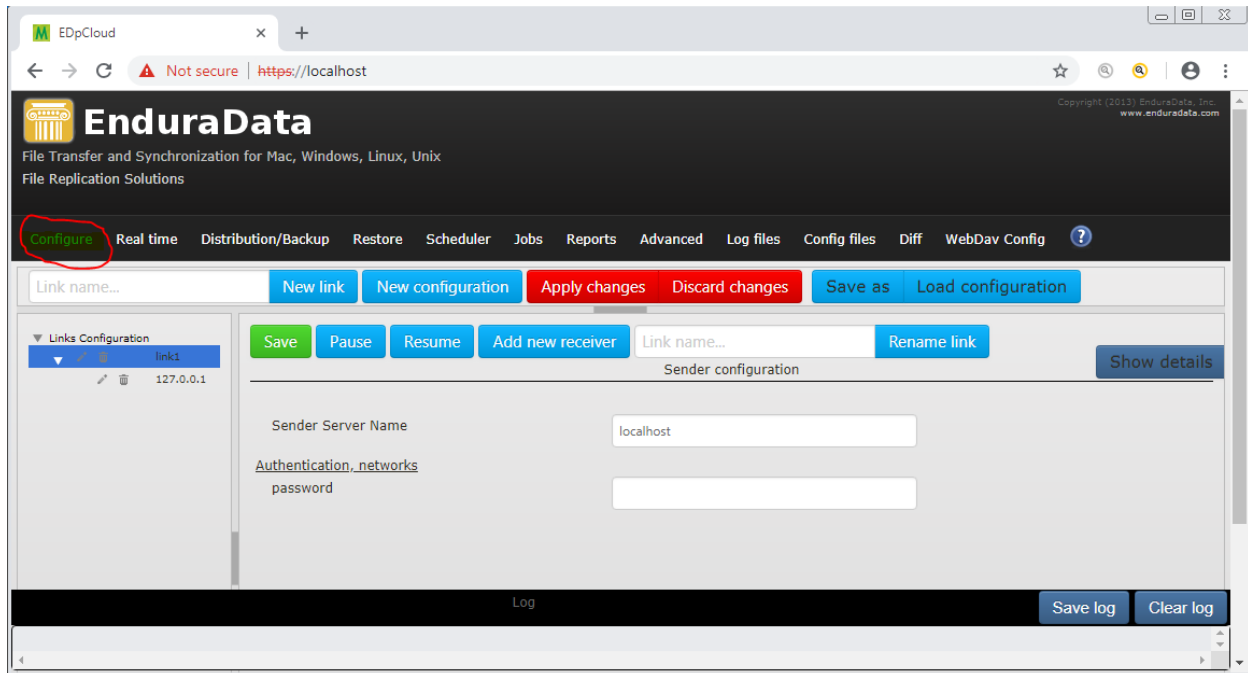
The next few steps consist of:

    a. Creating a link and a sender for that link

    b. Entering the password for the link (this is a different password than what is in edpasswd)

    c. Adding a receiver, with its data storage path

    d. Applying the configuration.

In this example we are configuring to send from a Windows machine to a Linux machine.
The windows machine is referred to as localhost. The remote Linux machine has IP 192.168.200.125

4.3.3 Configure the sender

a. Change the "Sender Server Name"

b. Change the link password

(Don't click on Apply changes until you are done configuring the receiver side)
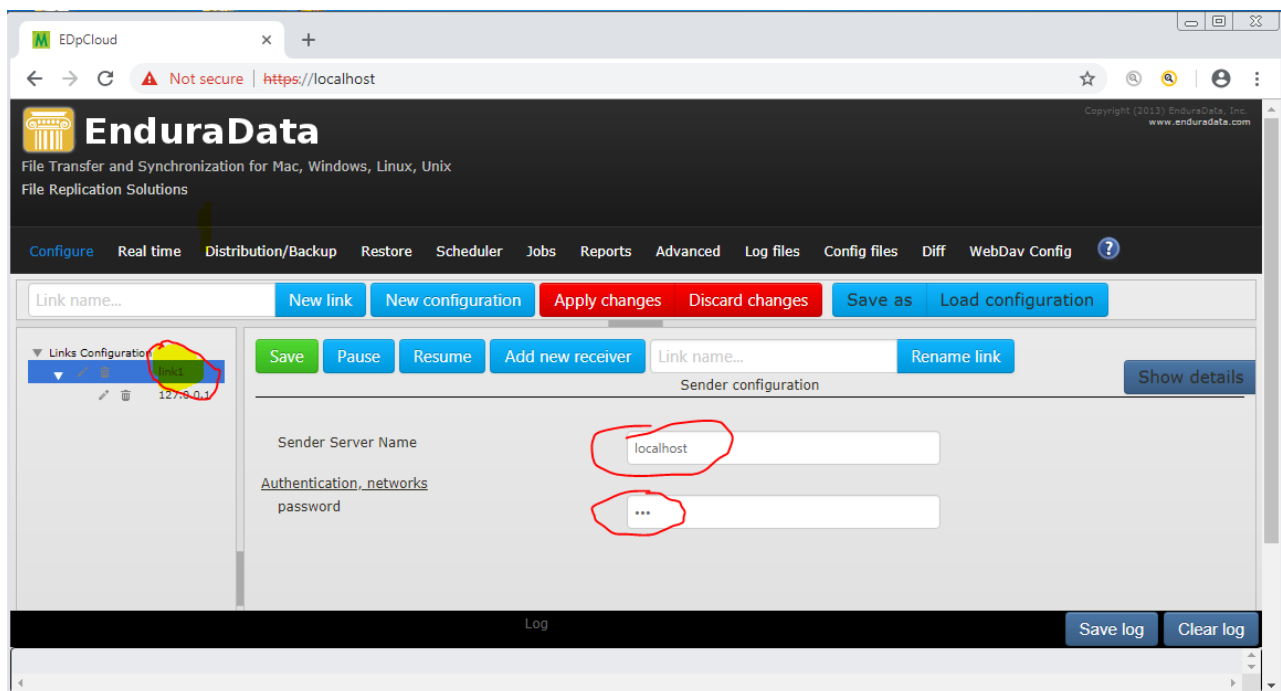
Once you change the "Sender Server Name" entry and password you will need to change the receiver. EDpCloud uses 127.0.0.1 as a place holder for the receiver until you change it.

4.3.4 Configure the receiver

a. Click on the receiver name on left hand panel under "Links Configuration" (highlighted in red).

b. Enter the receiver name (Remote Backup Server Name):

c. Enter the password (same as for sender) (This password is a link password and is different from edpasswd)

d. Enter the Storage folder (storepath): This is where data will be stored on the receiver side
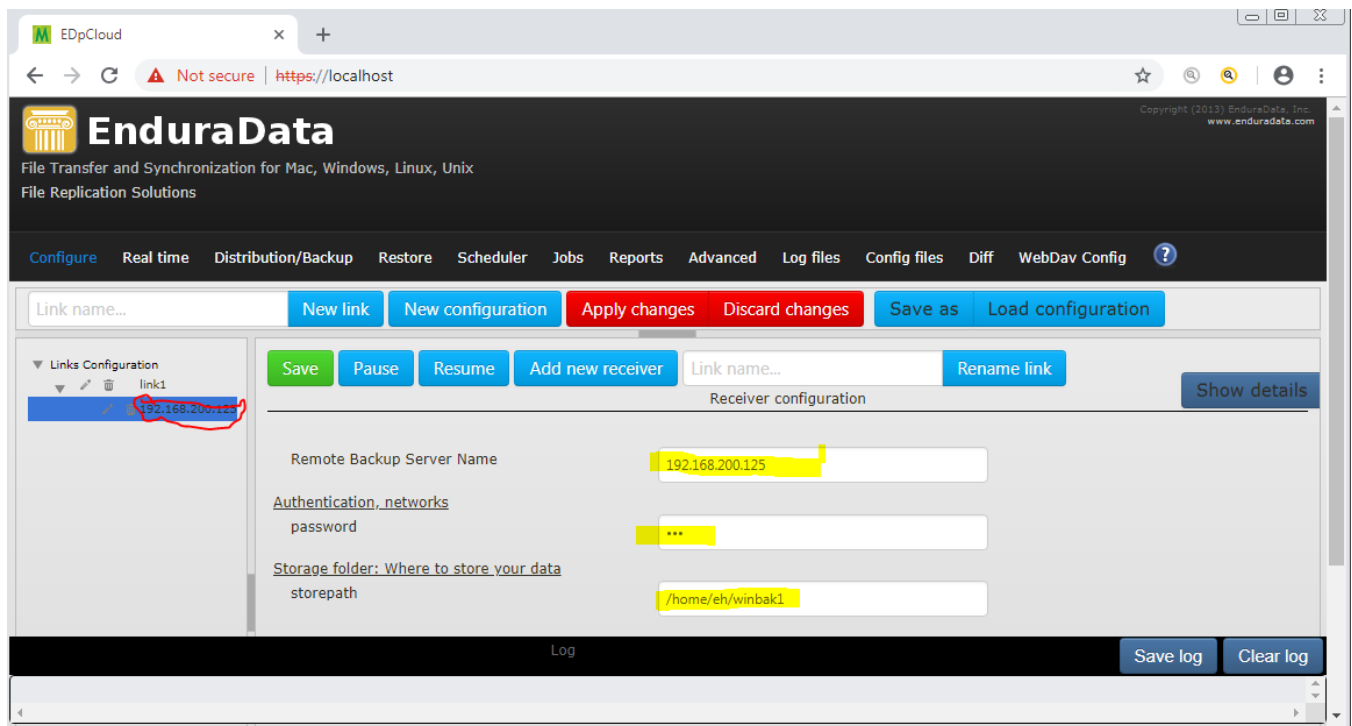
Once you change the receiver in the "Remote Backup Server Name" entry, the left entry will change to reflect the new receiver name or IP.

Notice that any name or IP that you use must be reachable from both the sender and receiver. If they are not, update your DNS or hosts file to map the IP to a hostname.

4.3.5 Press "Apply changes"

This is the last step for the basic configuration. It will save the configuration and apply all changes.

Your configuration will not take effect until you apply it.
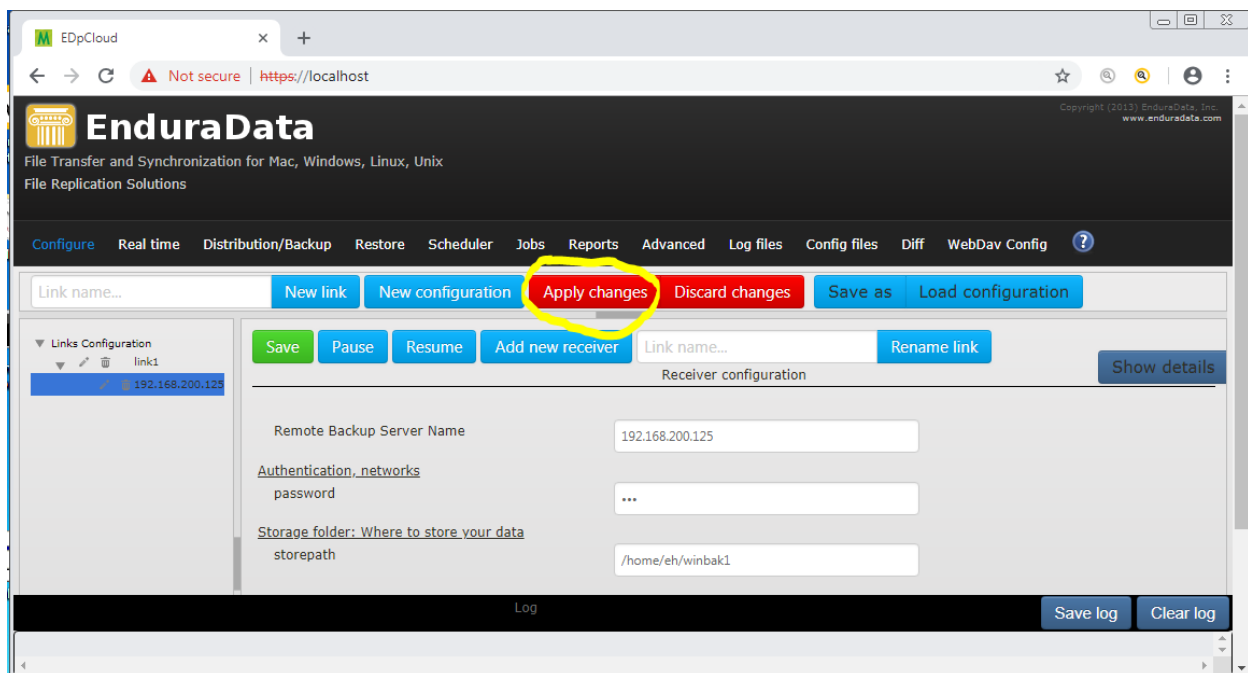
When you hit "Apply changes", the GUI saves and configuration in eddist.cfg and the local server applies it. You need to do the same thing on the other servers that are in the configuration.

4.3.6 Now verify that the configuration is ok.

a. Click on the "Reports" Tab.

b. Click on the "Status" Sub tab (under Reports)

If EDpCloud can resolve the hostname for the sender and if the machine you browsed to is a sender, it will display its status as shown below. Otherwise, you will see an error.

If you get any errors then proceed to the section about examining the error logs (unless the host is a receiver).
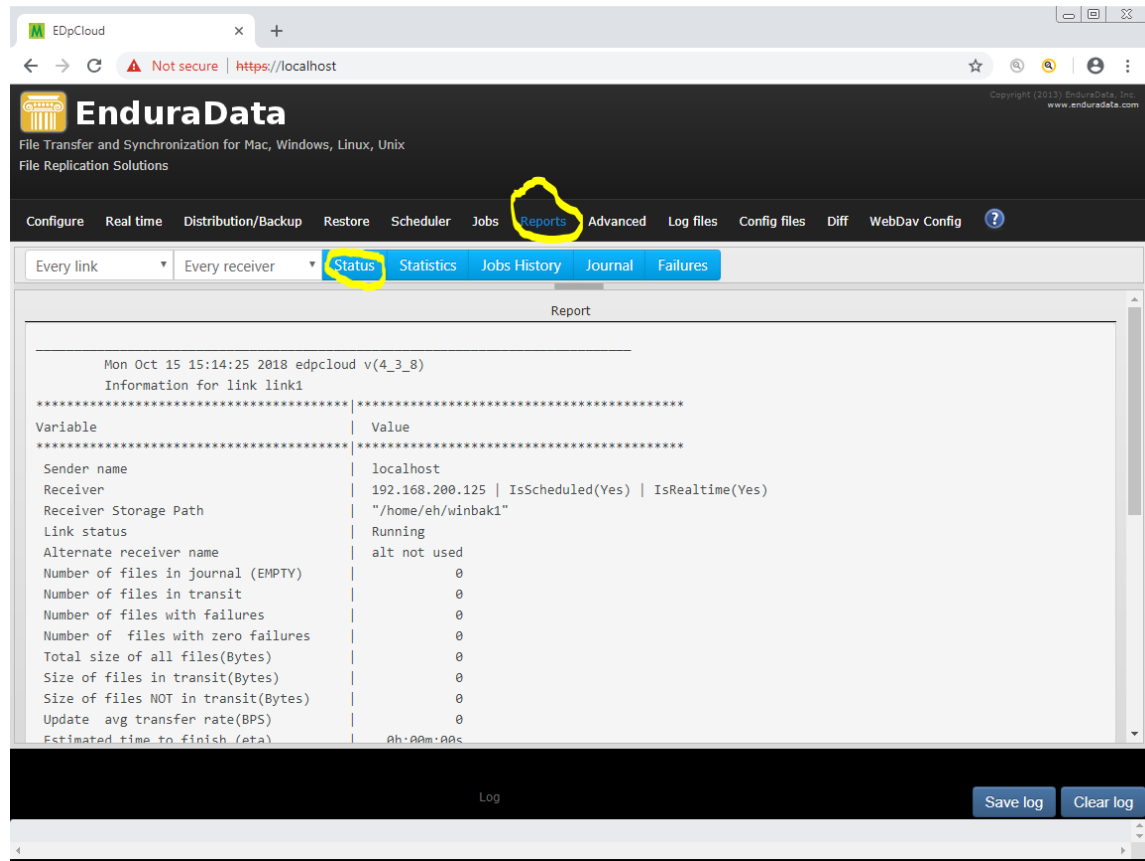
The figure above shows that there are no errors and there are no files pending or in transit.

4.3.7 Configuring real time replication

The real time configuration is called edfsmonitor.cfg. It is a listing of all directories that must be monitored in real time (One per line).

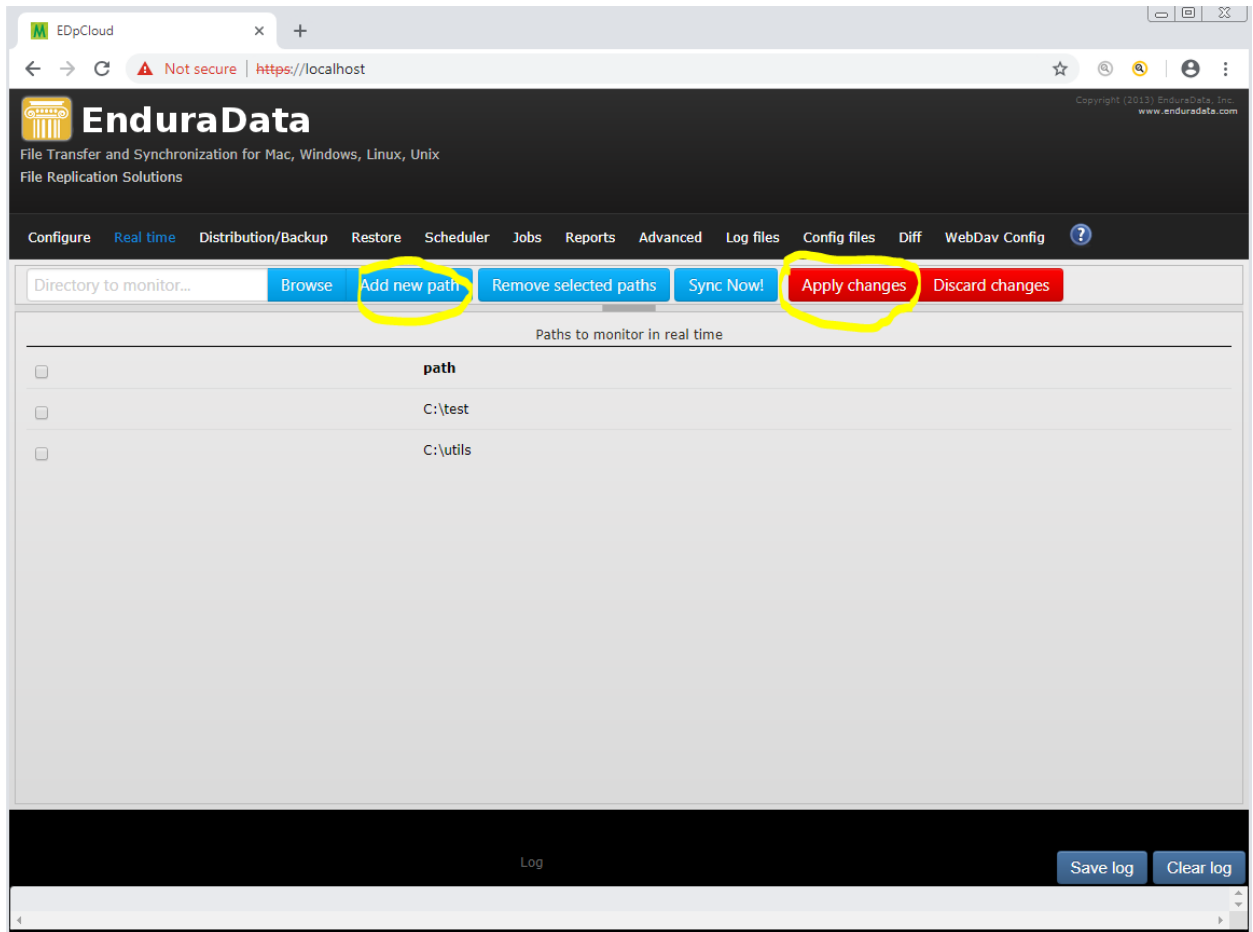Follow these steps to create and activate a real time configuration

    a.   Click on "Real time" tab

    b.   Click on "Browse" to add the directories
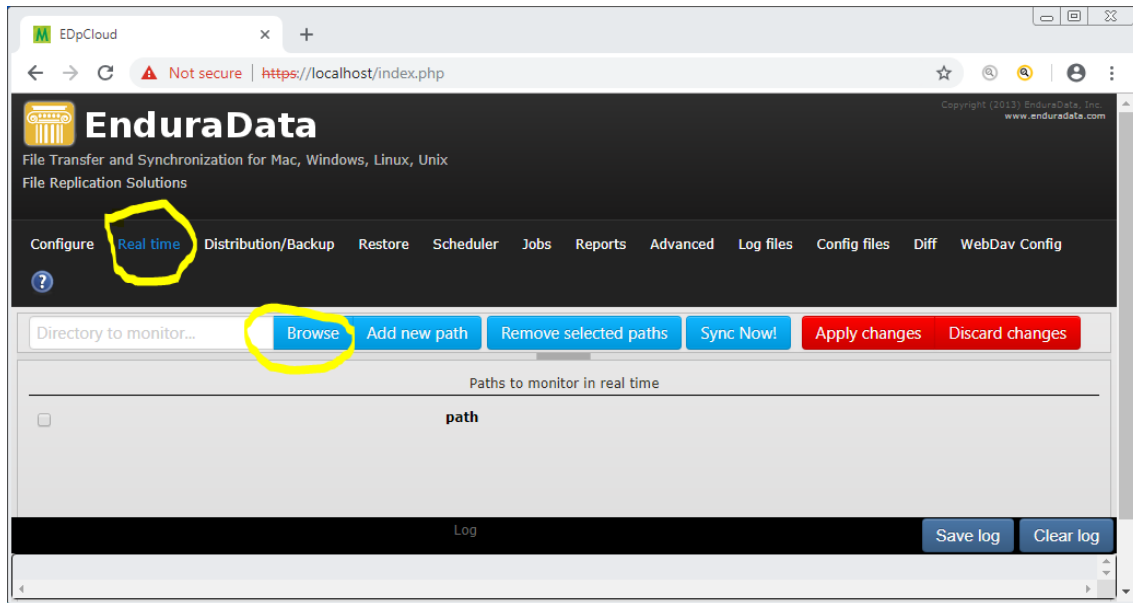
c. Select a few directories to test with first (You can come back and add other directories later)

d. Click "Ok" when done
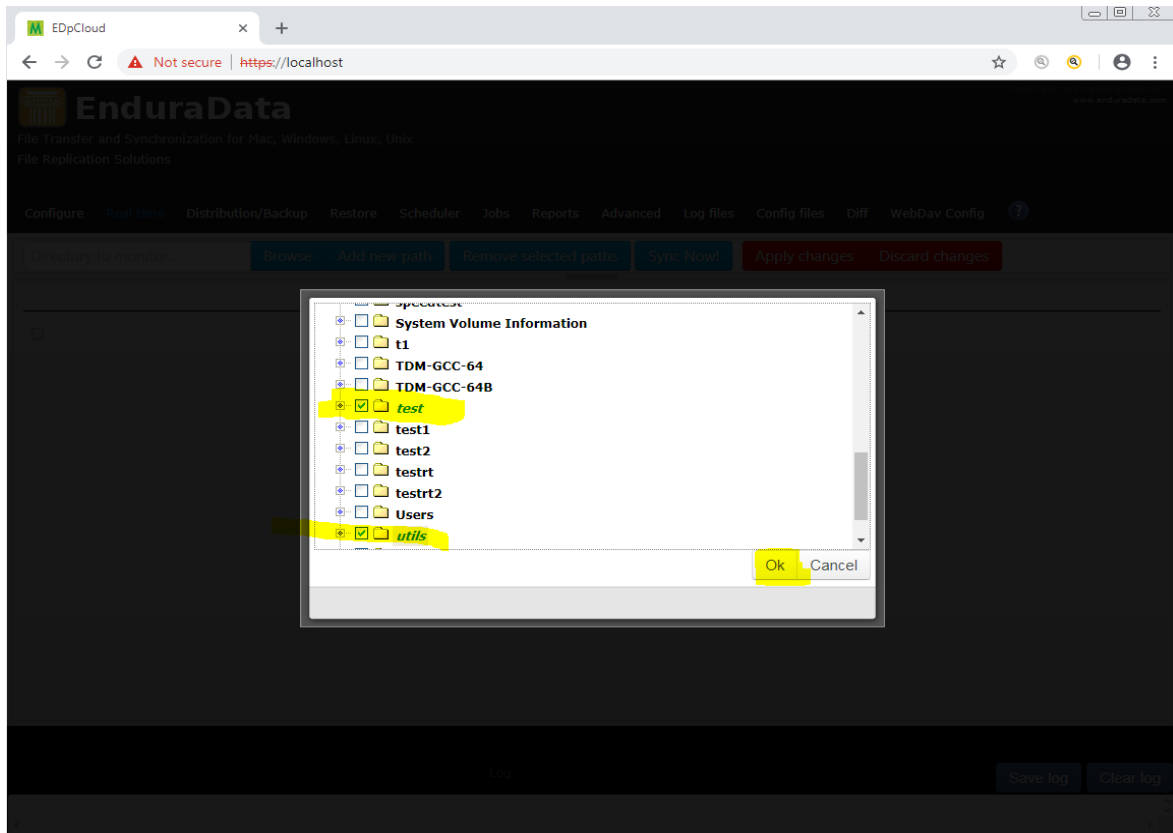
e. Click on "Add new path"

f. Click on "Apply changes"

From now on, the selected paths (C:\test and c:\utils) are monitored in real time and any changes that take places are sent to the remote location (Except for deletes which must be configured to be propagated: Visit the Configure tab and make such a change in the receiver section if you want deletes propagated).

4.4   Performing the initial or on demand file synchronization

You can perform on demand synchronization as needed. You always need to perform the initial synchronization for each path in the real time configuration after you configured the real time replication to monitor it. The following figures show examples of steps to perform replication on demand.

4.4.1 Using "Go!" to sync a small number of directories

a. Click on the "Distribution/Backup" tab

b. Select Link

c. Select receiver

d. Enter Path

e. Click on go "Go!" to sync right away
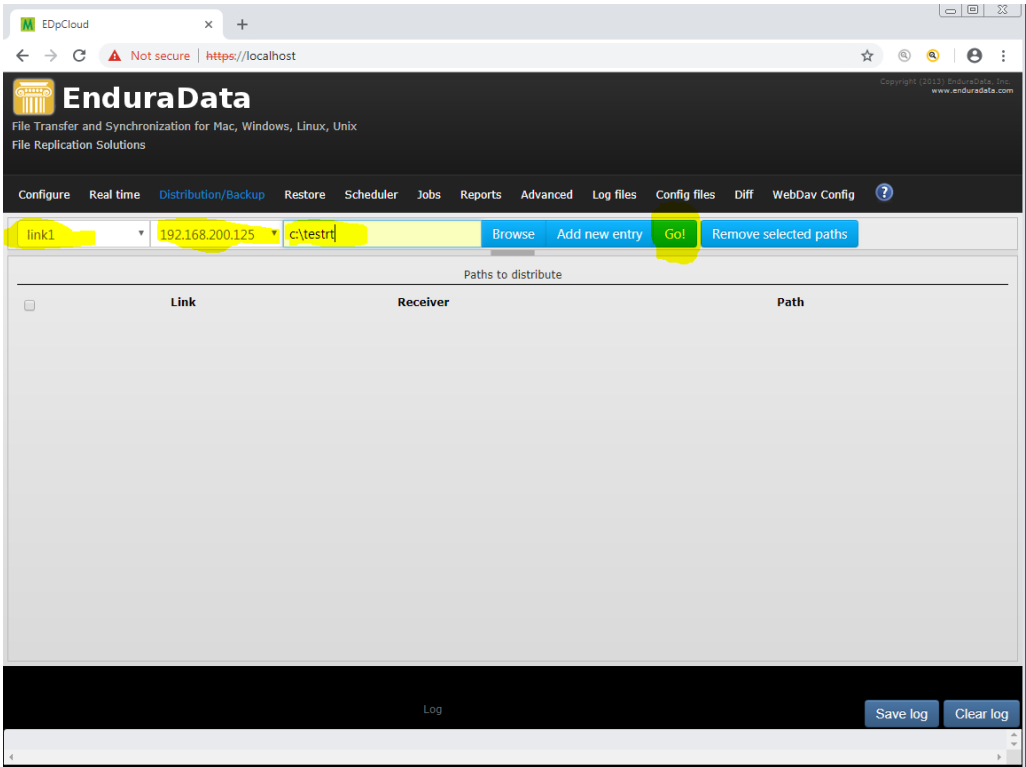
4.4.2   Synchronizing multiple directories

To sync multiple directories:

a. Select link

b. Select receiver

c. Browse and select directories (or files)

d. Click "Add new entry"

e. Select entries

f. Click on the red button "Start distribution"
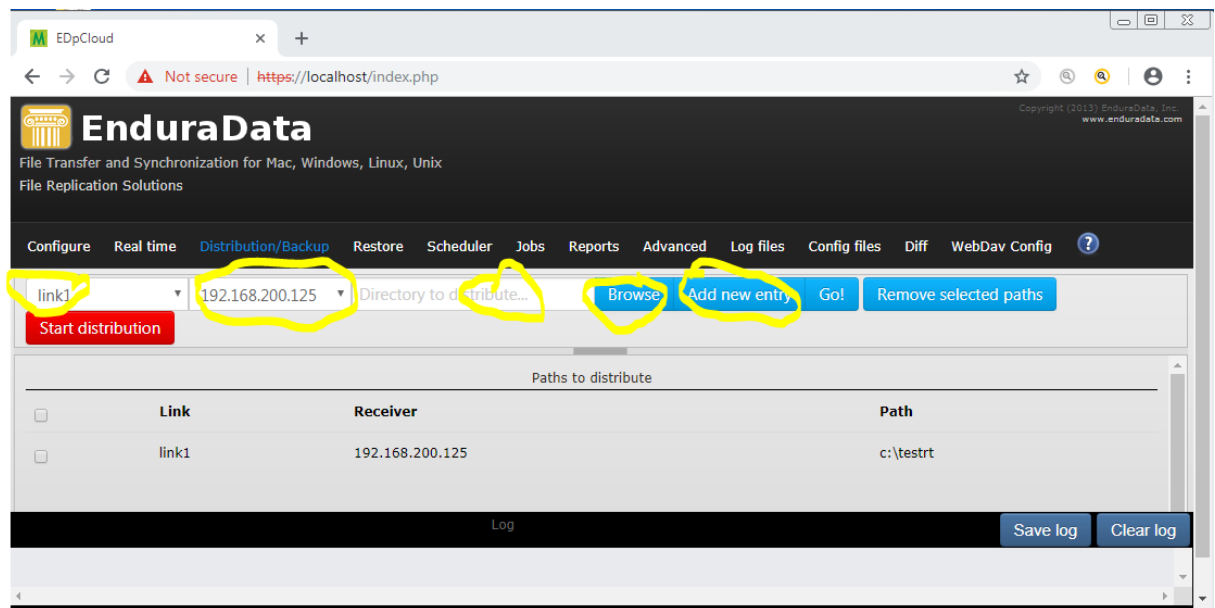
4.4   Error logs

You can examine the logs by Clicking on the "Log files" tab and examining the various log files in the left panel.

A good starting point are the following files:

a.   *eddist.log*

b.   *ed_sender_L_linkname_R_receivername.log* where linkname is the name of the link you created and the receivername is the name of the receiver you configured above.

Example: ed_sender_L_link1_R_192.168.200.125.log is the log for the sender from link1 to 192.168.200.125.

The following are examples of errors you may see:
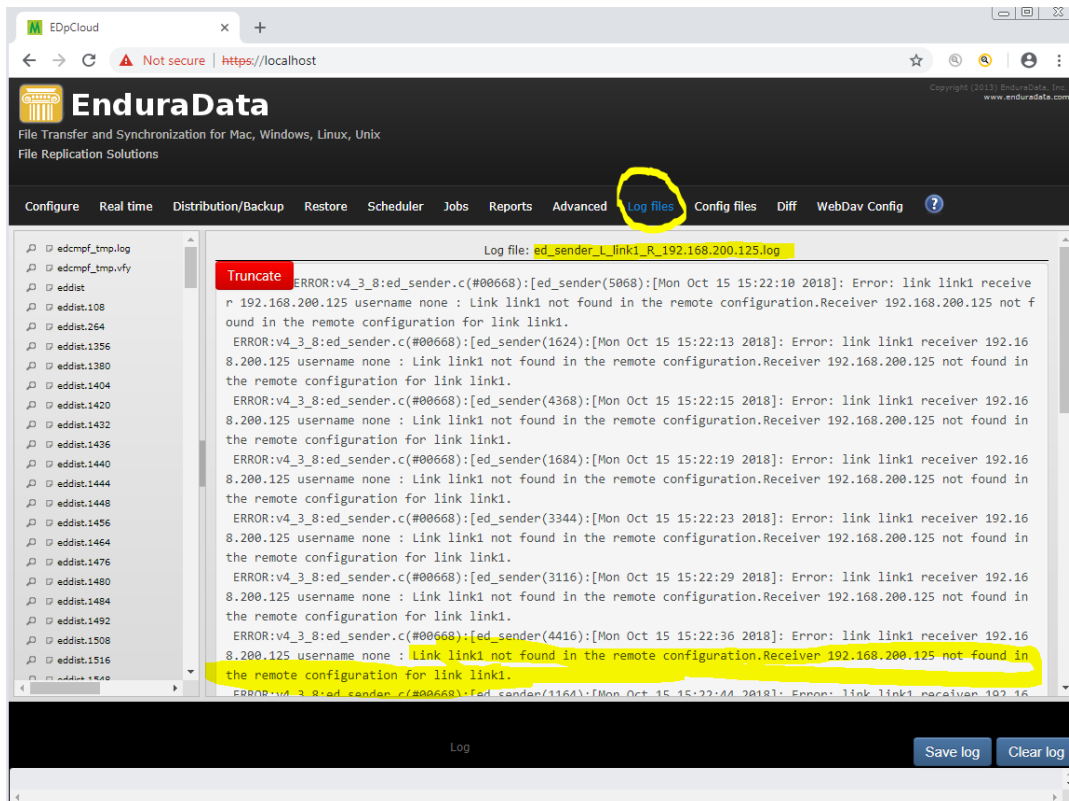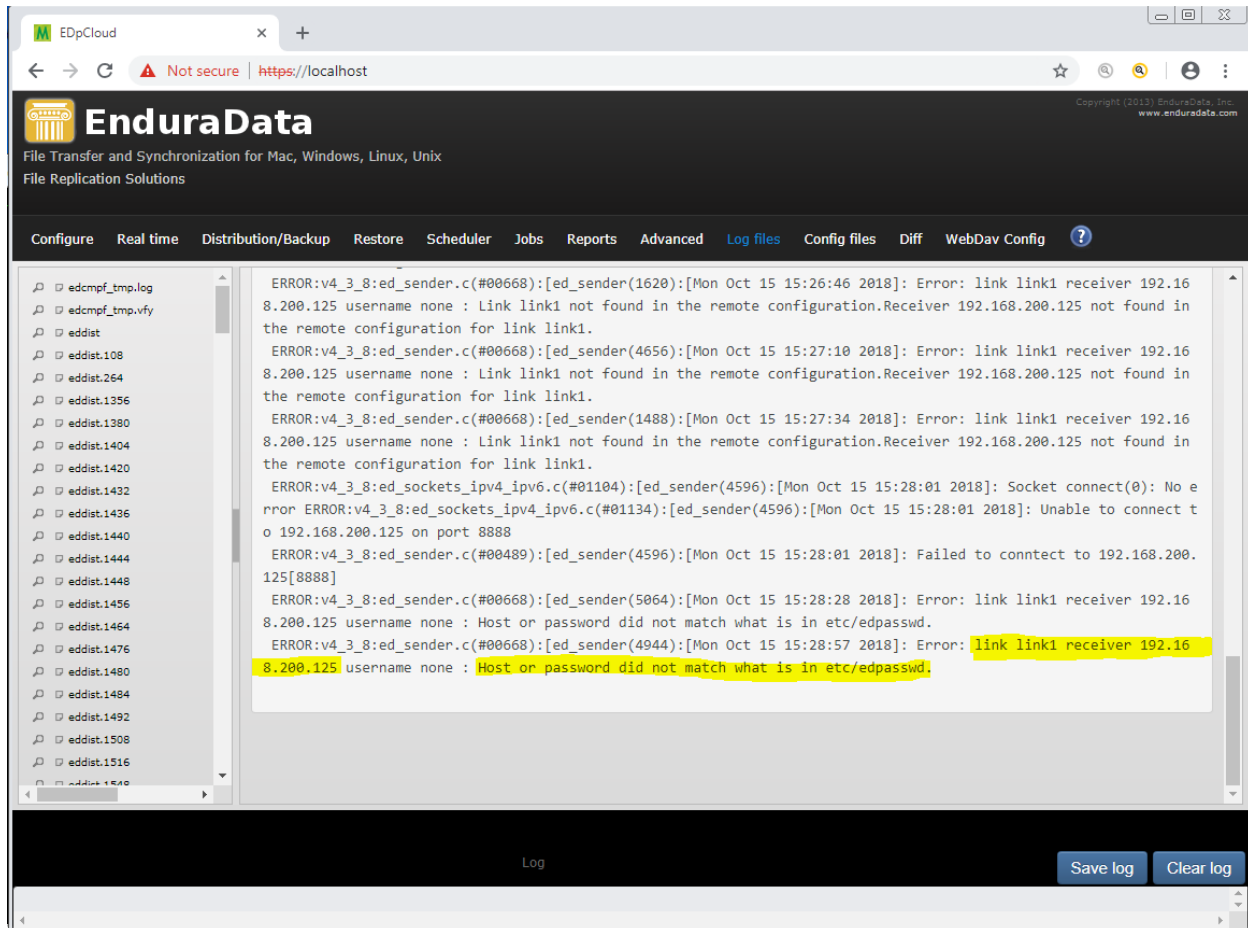
This error occurs when the machine that is issuing a status or any management command is not in the list of authorized machines or the password mismatches what is in edpasswd (remember it is located under …\edpcloud\etc). See section "Change management password (edpasswd)" for how to change it or use the command line interface or "Config files" tab.

Notice that 797 files have failed to replicate above. So we need to examine the log files starting with eddist.log and ed_sender_L_link1_R_192.168.200.125.log.

5.0   USING EDPCLOUD

5. USING EDpCloud FROM THE COMMAND LINE INTERFACE (CLI)

Please consult the manual pages to understand the various options available for all the commands.

You can use the various commands in your own scripts or in custom[1-n].* scripts under the bin directory.

Open a command line interface as root (Unix/Linux) or Administrator (Windows):

Once EDpCloud is running (use **edstat** on the sender), you can verify the on demand replication by testing a small directory or file:

The following will sync filename to every link in the configuration.

edq –n filename

Run edstat and verify that no errors encountered.

 If you find any errors then make sure that you go back to the troubleshooting section.

If there are no errors, but the files are not replicated then you will need to examine the "includes" and "excludes" policies on both the sender and the receiver.

A symptom of mismatch between includes and excludes on the sider side and the receiver side is that there are no failures and nothing is getting replicated.

5.1 Running the initial synchronization

Once your small test files or directories are replicated, you will need to perform the initial replication for each of the directories that you want to keep in sync. Please see the manual page for edq or edmfq for additional documentation.

Examples for Linux and UNIX:

Lets assume that the current localhost is configured to send to a receiver called orion via a link called fromhere2there:

pg. 66

a. To sync /home for fromhere2there to receiver orion on Linux

edq –l fromhere2there –r orion –n /home

The command above will synchronize everything under /home (that matches the includes and does not match the includes on the localhost and receiver) from the localhost to orion.

b. To sync /home from the local host to all links and to every receiver:
   ### edq –n /home

   When no link or no receiver are specified, the wild card ".*" is used
   When no link or no receiver are specified, the wild card ".*" is used

c. To sync /data1/source/foo.tar.gz to receiver orion in linkname:
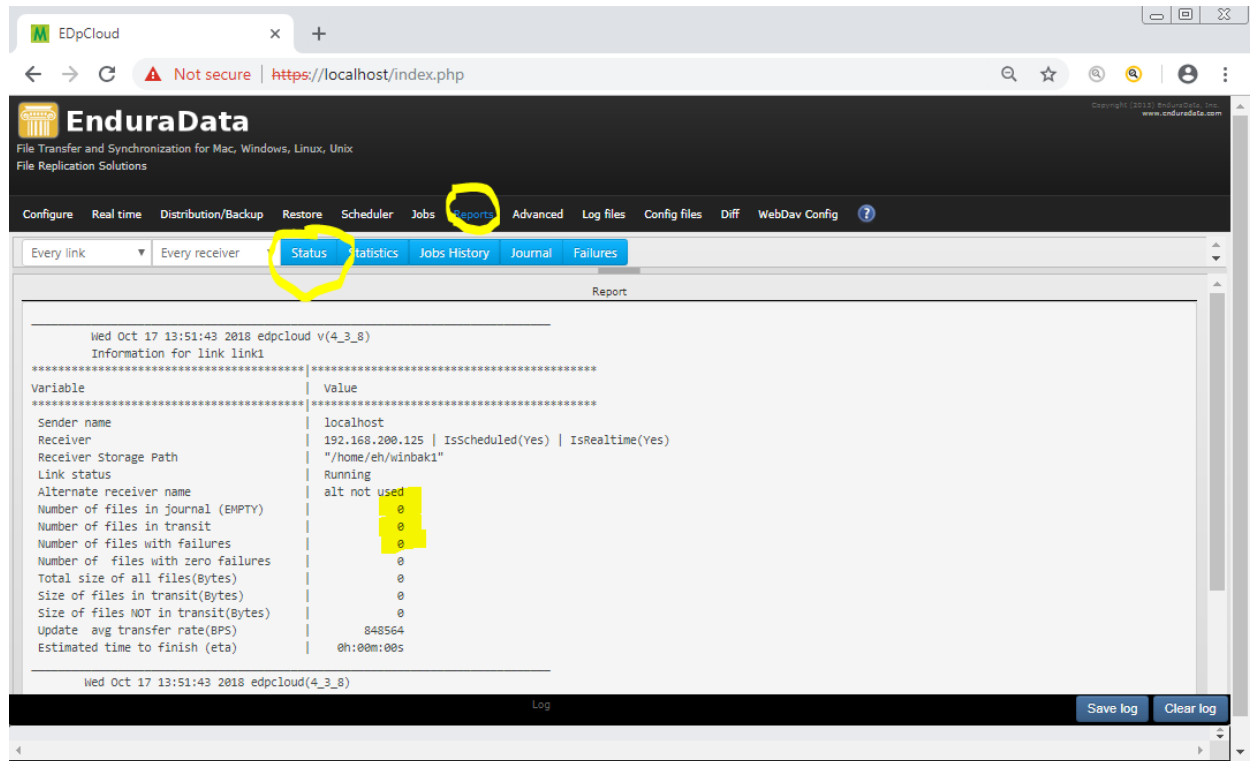   ### edq –l linkname –r orion –n /data1/source/foo.tar.gz

Examples for Windows

a. To sync D:\data for linkname to receiver orion on Linux

edq –l linkname –r orion –n d:\data

Use edstat to see the status.

Here is an example of how to see the status in the browser:

If you configured the real time replication above before you performed the initial synchronization, then any file changes that occur in the directories listed in **$edpcloud/etc/edfsmonitor.cfg** will be replicated immediately after your changes are made.

If you are not using real time replication, you can create a schedule to replicate data as needed automatically.

5.2 Creating a file replication schedule from the command line

EDpCloud uses $edpcloud/etc/edscheduler.cfg to configure a schedule of various operations.

Each line in edscheduler.cfg has the following format:

- Minute hour dayofmonth month dayofweek command [command arguments]

- Minute: 0 - 59

- Hour: 0-23

- Day of month: 1-31

- Month: 1-12

- Day of week: 0-6 where 0 is Sunday, 1 is Monday … 6 is Saturday

- Command: Any command you want executed

- Command arguments: any arguments for the command above.

You can use various commands to sync, pause, resume, cancel, etc.

The manual page edscheduler.cfg has more details.

Example:

The following will:

a. Replicate /home from link1 to every receiver at 6:30 pm, every day of every month
b. Pause replication at 7am
c. Resume replication at 4:30pm

```
30  18  *  *  * /usr/local/enduradata/edpcloud/bin/edq  -l link1 –n /home

0   7 *  *  * /usr/local/enduradata/edpcloud/bin/edpause

30  4:30  *  *  * /usr/local/enduradata/edpcloud/bin/edresume
```

5.3 Creating a file synchronization schedule using the browser

To create a schedule to sync data (You can also use the scheduler for other operations):

a. Select the Scheduler tab

b. Select "Distribute" from the "Operation" drop down menu

c. Select the "Link" you want to send from

d. Select the receiver you want to send to

e. Select the times and dates you want this to happen on

f. Select the path (or paths)

g. Press "Add" and then "Apply changes (As shown in the next figure)"
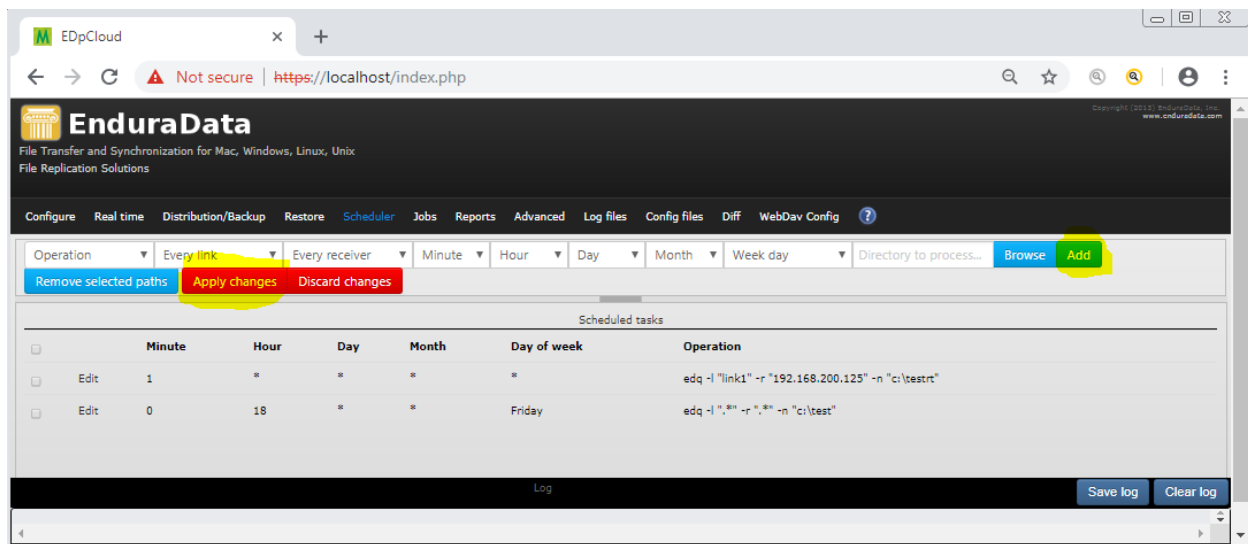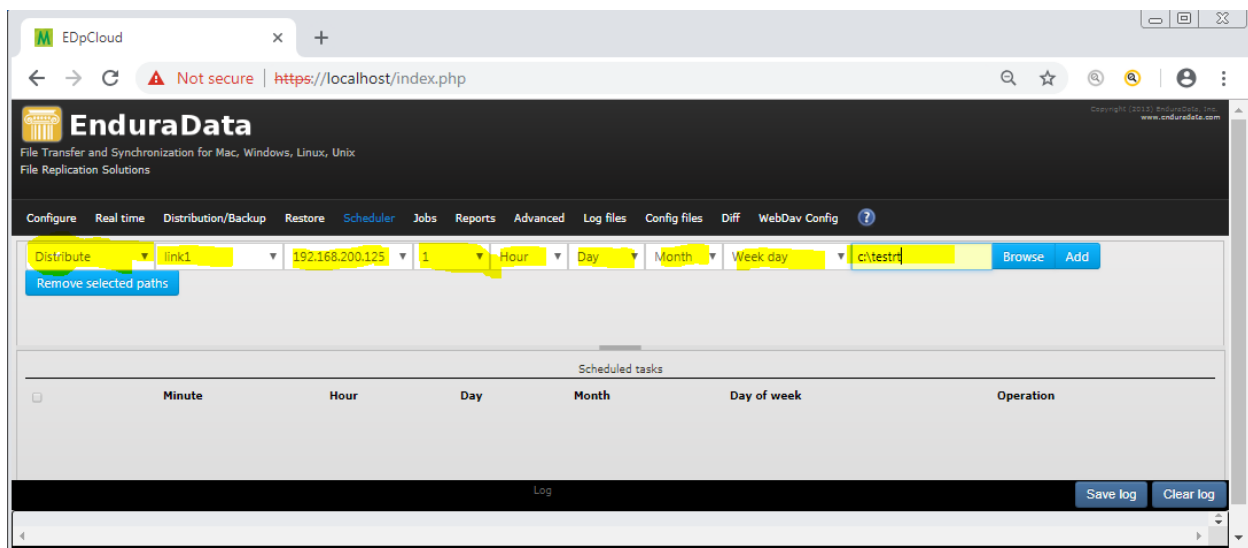
The schedule above will do the following:

a. Start to sync the content of c:\testrt at minute 1 of every hour, every day, every month, every week from link1 to receiver 192.168.200.125

b. Start to sync c:\test at 6pm every Friday (from every link on this host to every receiver in every link)

5.4 Examining and canceling file replication jobs

Use edjob to see the list of jobs that run and their status. Each job has an id. Real time jobs have a path label of _RT_ because they deal with multiple paths while scheduled jobs or on demand jobs have a unique path name.

Examples:

- ***edjob*** : will list all past jobs for the localhost
- ***edjob –l link1 –r orion*** : will list jobs for link1 to receiver orion
- ***edjob –l link1*** : will list all jobs for link1 to any receiver
- ***edjob –c –j 12*** : will cancel job number 12
- ***edjob –c –m 1 –M 32***: will cancel jobs 1 to 32

To cancel jobs in the GUI as shown below:

    a. Click on the job's tab

    b. Select job(s) that you want to cancel

    c. Click on the red button: Cancel job(s)
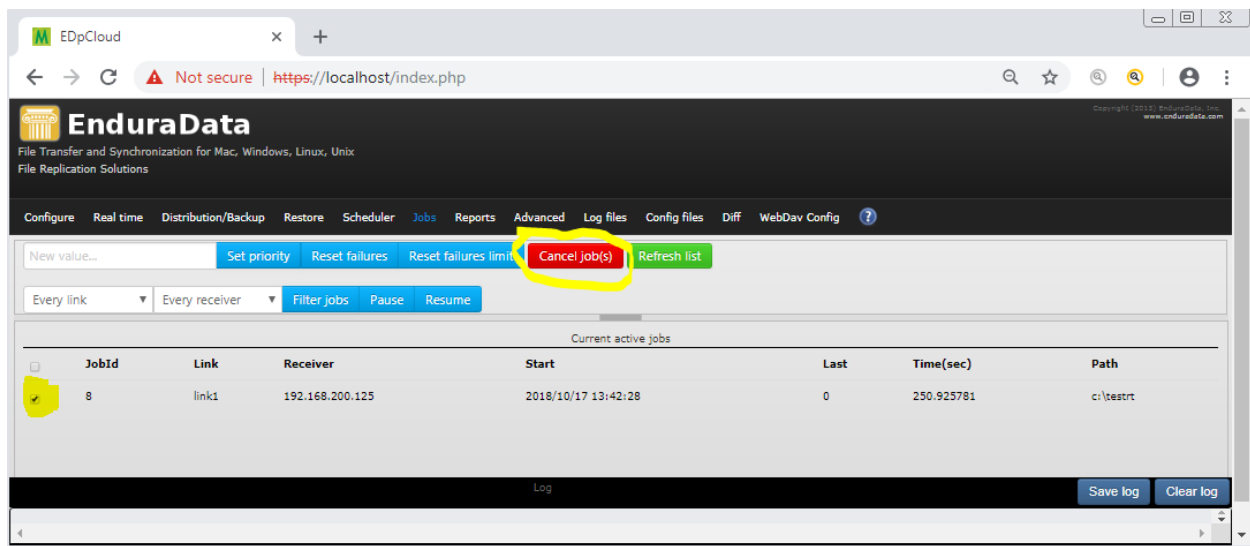
The manual page for edjob lists all uses of edjob command.

5.5 Additional manuals and documentation

Additional manuals and documentation are available, from www.enduradata.com, in the following formats:

- Man pages
- HTML
- PDF
  These documents are also available under edpcloud docs subdirectory.

5.6 Special Instructions for Error Correction

As a condition of your use of the Services, you will not use EnduraData's solution or Services for any purpose that is unlawful or prohibited by these terms, conditions, and notices. You may not use the Services in any manner that could damage, disable, overburden, or impair any business, government, individual, system, animal or ecosystem.

5.7 Caveats and Exceptions

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