

Europe Aid/132517/D/SER/Multi

***Monitoring for Environment and Security in Africa (MESA)***

*CONTRACT NO. EDF 2013/315-947*

## **eStation 2.0**

**Administration manual**

**Draft 1.1**

***July 2015***

**Date:** //

**Ref:** MESA/DOC/eStation/...



Abstract / Résumé
This document provides instructions for the management of the eStation 2.0 system on MESA computers.

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	Details	Date
Version history	Draft 0.1	December 2014
	Draft 1.0	May 2015
	Draft 1.1	July 2015

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## ACRONYMS and DEFINITIONS

AMESD	African Monitoring of Environment for Sustainable Development
ACMAD	African Centre of Meteorological Applications for Development
AGRHYMET	Centre Régional de Formation et d'Application en Agrométéorologie et Hydrologie Opérationnelle
AU	African Union
BDMS	Botswana Department of Meteorological Services
CICOS	Commission Internationale du Bassin Congo-Oubagui-Sangha
CWG	The MESA Continentalisation Working Group
EO	Earth Observation
EUMETSAT	European Organisation for the Exploitation of Meteorological Satellites
EUMETCast	EUMETSAT's primary dissemination mechanism for the near real-time delivery of satellite data and products
FTP	File Transfer Protocol
GIS	Geographical Information System
IOC	Indian Ocean Commission
JRC	Joint Research Centre of the European Commission
MESA	Monitoring for Environment and Security in Africa
MOI	Mauritius Oceanography Institute
REC	Regional Economic Communities
RIC	Regional Implementation Centre
TA	Technical Assistance
TAT	Technical Assistance Team
THEMA	Regional and Continental Thematic Actions

## **1. INTRODUCTION**

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### **1.1 SCOPE OF THE DOCUMENT**

This document describes how to maintain the eStation 2.0 application, installed on the MESA computers, or on a different hardware. It is meant mainly for the IT Specialist taking care of the basic operations of configuring the system, performing diagnostic actions and recovering from faulty conditions are described.

### **1.2 DOCUMENT ORGANIZATION**

The present document is structured into the following chapters:

- Chapter 2: Access to the Station

It describes how to connect to the system, both from the local PC and from a remote computer that can access the eStation through a LAN.

- Chapter 3: System Maintenance

It describes the main operations to be performed for the system maintenance, including monitoring the disk space, perform diagnostic and recovery operations.

- Chapter 4: System Description

It describes the organization of the System in terms of directory structure, postgresql database structure. It is often used as a reference from other chapters of the document.

- Chapter 5: Trouble Shooting

It describes the most common errors/problems that can be found on the system and how to deal with them.

## 1.1 APPLICABLE AND REFERENCE DOCUMENTS

<b>Id</b>	<b>Title</b>	<b>Date</b>	<b>Reference</b>
AD-1			
AD-2			
AD-3			
AD-4			

**Table 1: Applicable documents**

<b>Id</b>	<b>Title</b>	<b>Date</b>	<b>Reference</b>
RD-1	eStation 2.0 User Manual		User Manual
RD-2			
RD-3			

**Table 2: Reference documents**



## 2. ACCESS TO THE eSTATION (AMESD/MESA)

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*Describe how to log to the system - for the AMESD/MESA Stations – the Users, and how to mount the dataset from an external PC*

### 2.1 LOGIN TO PC2 AND PC3

The following Users are defined on the AMESD/MESA computers for eStation 2:

Name	Password	Role	Comments
<b>adminuser</b>	<b>mesadmin</b>	Manages the installation, the upgrades and ensure maintenance of the system	He/she is expected to be an IT System Administrator.
<b>analyst</b>	<b>mesa2015</b>	Thematic Expert using the system to perform environment monitoring.	He/she is expected to be an Environmental Analyst.

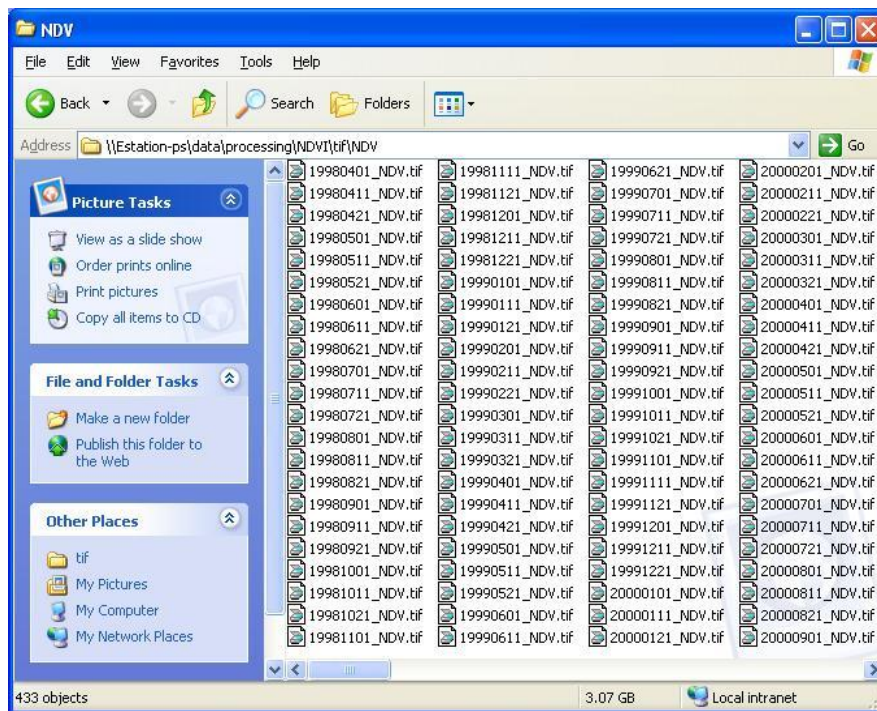
- Add screenshot of the Ubuntu 12.04 login page.
- Clarify how the keyboard setting can be an issue (and how to face it)

### 2.2 REMOTE ACCESS TO THE eSTATION

The eStation 2.0 is meant to be connected to a LAN in the beneficiary Institution, in order to access its datasets and web-client remotely. The configuration of the IP addresses in order to connect to a LAN is done in the User Manual, in Chapter 4.

#### 2.2.1 Accessing the datasets

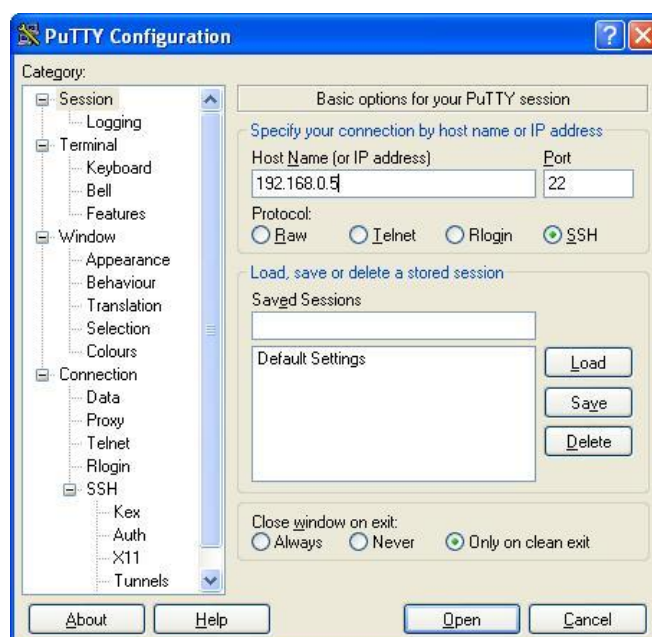
Directory /data of eStation 2.0 is shared on the network using the SAMBA protocol. Therefore any host that is connected to the same network as the eStation will be able to seamlessly access the data and read them. This means that data can be open in classical image processing software or copied to another computer connected to the same network. For connecting a MS-Windows XP computer to the eStation local network see Annex 6.1.1. For mounting a network drive refer to Annex 6.1.2. For other Operating System ask your local network administrator.



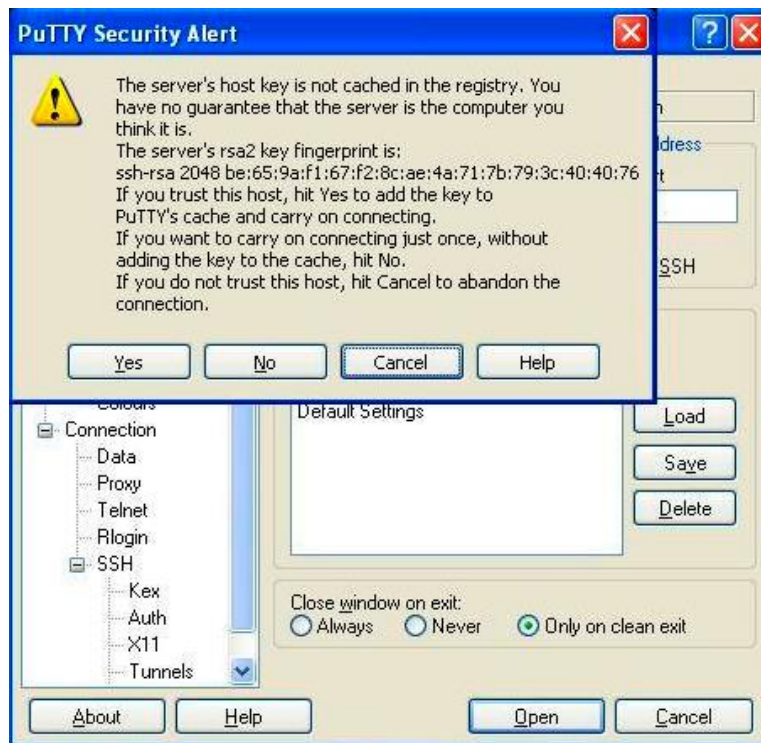
**Figure 1: eStation data repository as seen from a Windows-XP PC (update picture)**

### 2.2.2 Connect by remote shell (ssh)

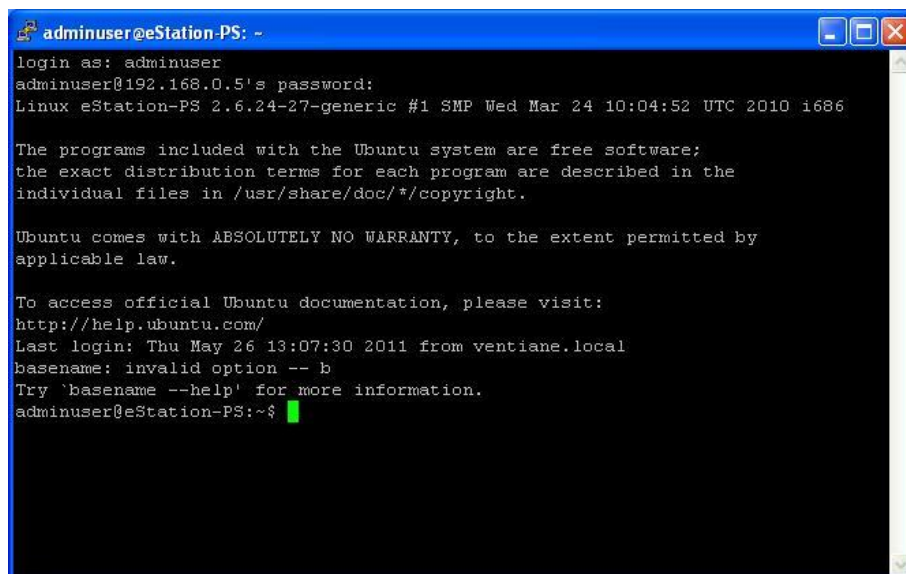
Both PCs are shipped with the **ssh** protocol (part of Ubuntu OS). Therefore any host that is connected to the same network as the eStation, will be able to remotely access it. Therefore open a session and type commands, as if the user was physically connected to the console. For connecting a MS-Windows XP host to the eStation local network, please refer to Annex 6.1. Note that a software client, such as PuTTY (directly and freely downloadable from the internet) is required. Also, if there is a firewall between your host and the eStation the ssh connection will probably not work. In such case ask assistance to your system administrator.



**Figure 2: Example of PuTTY connection screen (update IP)**



**Figure 3: PuTTY first connection: answer 'yes' to cache the key**



**Figure 4: Remote shell window (update hostname)**

### 2.2.3 Graphic connection (X-session)

The method described above (ssh) allows the user to open a remote connection restricted to the command line interface. If the user needs to run an application through a GUI, he will have to first run an X-emulator, able to support graphical instructions. We recommend to use FreeNX (<http://freenx.berlios.de>). This library supports X-emulation for PuTTY and desktop export to your PC (which means than you see the remote eStation desktop on your PC's screen). Please check with your local network administrator (to be confirmed).

### 3. eSTATION MAINTENANCE

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It describes the main operations to perform for the system maintenance, including monitoring the disk space, perform diagnostic and recovery operations.

#### 3.1 MONITORING THE STATUS OF THE SYSTEM

##### 3.1.1 Monitoring the status of the disk

The MESA eStation 2.0 is installed on DELL Optiflex 9020 machine equipped with a 1 Tb disk, in RAID0 redundant configuration.

The User can check this configuration in several ways, according to the status of functionality of the system, and its convenience.

##### *Check the disk status from the Web Interface*

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(To be completed).

##### *Check the disk status from the terminal*

---

(To be completed).

##### *Check the disk status by using Ubuntu tools*

---

(To be completed).

##### 3.1.2 Checking the Hardware status

(To be completed).

##### 3.1.3 Checking the Log files

(To be completed).

### 3.2 IMPORTING DATASETS

On the eStation 2.0 several mechanisms to acquire data exist; they are briefly detailed here below:

- Acquisition of 'native' data: this is the standard mechanism for a system in operation, and is implemented through the eStation2 Services ('Get Eumetcast', 'Get Internet' and 'Ingestion'). The files treated are in the 'native' format as generated by the data provider.
- Acquisition of data in eStation format, as disseminated through EUMETCast by JRC (or the RICs). The data represents either
  - 10day synthesis of high temporal frequency products (e.g. LST, ET)
  - Long term statistics that are computed over a long period, which is not fully present on the MESA Stations.
- Import of an eStation 'Archive': this mechanism applies to products in 'eStation' format (see User Manual, Chapter 2) that are 'packed' into a zipped tar file (.tgz). It is implemented by simply copying the files from the archive directly copied to the target directories, without any processing. The original mapset is therefore maintained and, as a consequence, only one mapset can be dealt with.

### **3.3 PERFORMING VERSIONS UPGRADES**

#### **3.3.1 The Ubuntu upgrade mechanism**

Description of the 'upgrade' mechanism (namely .deb packages, symbolic links to version-dependent dirs.)

#### **3.3.2 Switch from a version to the next one**

#### **3.3.3 Switch back to a previous release**

### 3.4 MANAGING THE POSTGRESQL DATABASE

- How to access the DB (PgAdmin3)
- DB synchronization and dump (bucardo)
- How to restore a previous copy of the DB

### 3.5 DIAGNOSTIC TOOLS AND USER SUPPORT

- System Report (***from the GUI and outside***)
- Hardware Report
- How to send to the Helpdesk
- Tuleap tool and other online resources.



## 4. SYSTEM DESCRIPTION

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*Describe how to configure the 'system' at a high-level: operating modes, PC2/PC3 or single-machine, connection to the internet.*

### 4.1.1 Directory Structure

The eStation 2.0 is integrated into the Ubuntu OS taking account of the Linux machined predefined directories, and their management (e.g. for the /tmp directory which is cleaned at each machine reboot).

The following paragraphs describes the main directories existing in the Ubuntu installation, which exactly the same for MESA and AMESD machines, and for the Full Station or Single PS implementation.

#### Base directory of the eStation SW

The eStation software (mainly python and .js) is installed in a directory tree that is predefined at the installation in the Ubuntu OS as:

```
ESTATION2_BASE_DIR_SYSTEM=/srv/www/eStation2/
```

This directory is actually a symbolic link to a version depending directory, which is created at the initial installation, and following upgrades, with the convention below:

```
/srv/www/eStation2-V.V.V-Rel/
```

The initial system will be therefore under:

```
/srv/www/eStation2-2.0.X-1/
```

#### Release independent data and setting

Some data and User's settings will be stored under a directory which is independent from the software release, so that they are not going to be touched by the software upgrade. This directory is identified by a variable named EStation2\_LOCAL\_DIR and predefined as below:

```
ESTATION2_LOCAL_DIR=/eStation2/
```

Under this base-directory, the following subdirectories exist:

```
/eStation2/settings: user settings and status of the system  
/eStation2/get_lists: list of files acquired by the 'get' services (eumetcast/internet)  
/eStation2/processing: locks of the processing chains  
/eStation2/log: log files  
/eStation2/dbdata: installation of the postgresql database
```

#### Temporary/working directories

Another category of data is represented by the runtime temporary data that are generated by the application in the background, and that need to be cleaned at each reboot, like the working directories used for intermediate processing steps. The base directory is defined as:

ESTATION2\_TEMP\_DIR=/tmp/eStation2/

And subdirectories as:

/tmp/eStation2/services: pid files of the running services

/tmp/eStation2/processing: log files of the individual processing chains

#### Data Directories

The EO datasets retrieved and processed on the eStation2 are store in predefined directories,

ESTATION2\_BASE\_DIR\_DATA=/data/

ESTATION2\_INGEST\_DIR=/data/ingest/

*/data/ingest*

*/data/processing*

Please note that, unlike the three previous categories that should not be changed by the User in normal circumstances, these directories can be freely change to process/visualize data stored on a different file system, e.g. an external disk connected to the machine.

#### 4.1.2 File and directory naming conventions

Both eStation 2.0 dataset files (i.e. the ingested and derived products) and the directory trees where they are stored obey to strict naming rules, so that the data location is depending on very few key elements. These elements are namely the product, version, subproduct and mapset and their meaning is described in section **Error! Reference source not found.**, and briefly repeated hereafter:

Product: the product identification code (or **<productcode>**)

Version: the version of the dataset, corresponding to the algorithm (or **<version>**)

Subproduct: the specific dataset that belong to a product (or **<subproductcode>**)

Mapset: the geo-reference and boundary box of the file (or **<mapset>**)

##### Directory naming

All files are stored in a **<base\_processing\_dir>** (**/data/processing/** by default)

Under this root, the files are organized per product as below:

**<productcode>/<version>/**

e.g.: **vgt-ndvi/spot-v1/**

For native products:

native/...

For ingested products:

**mapset/tif/subproductcode/**

e.g.: **/data/processing/vgt-ndvi/spot-v1/WGS84\_Africa\_1km/tif/ndv**

For derived products:

**mapset/derived/subproductcode/**

e.g.: **/data/processing/vgt-ndvi/spot-v1/WGS84\_Africa\_1km/derived/10dmax**

## File Naming

<date>\_<productcode>\_<subproductcode>\_<mapset>\_<version>.tif  
e.g.: 20150101\_vgt-ndvi\_ndv\_WGS84-Africa-1km\_spot-v1.tif

#### 4.1.3 Database Description

Detailed description of the database schemas and tables (to be completed).

#### 4.1.4 PCs synchronization

##### Data synchronization

All data under /data/processing directory are synchronized from PC2 to PC3 (in Nominal Mode) by using rsync daemon.

##### DB synchronization

The user - in Nominal Mode – modifies the ‘product’ schema on PC2, by changing the settings of the Services (get, ingest, processing) and by – optionally – adding new data sources, new product or subproduct, either by ingestion or processing (see User Manual, chapter 2 and 3) .

On the opposite, by performing the analysis on PC3, the User changes the legends definition and assignment to products, and these changes are stored in the ‘analysis’ schema.

Therefore, through the *bucardo* application, the sync of ‘product’ table is done from PC2 to PC3, and of the ‘analysis’ table from PC3 to PC2, in Nominal mode.

Detail the bucardo configuration (to be done).

## 5. TROUBLESHOOTING

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*It describes the most common issues/errors in the system, and how to deal with them.*