



## S&F - Store & Forward

### Setting up an SSH server

### PLAYER ONE / PLAYER ZERO





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Implementing S&F (Rsync) in SSH

Store & Forward module (Rsync)



#### 1. INTRODUCTION

## The Store and Forward (S&F) module allows PLAYER devices (Player ONE and Player ZERO) to download remote audio content to local storage media (USB/uSD).

When it is active, it checks a remote location that hosts audio content on a daily basis, compares it to the current content stored on local media (USB/uSD) and, if necessary (if differences are detected), syncs the local content to make it an exact copy of the remote content. This is a safe method of playing content on the device during working hours (during the day), storing it on local media without the risks associated with real-time streaming.

The Store and Forward utility for remotely synchronising music content uses the Rsync (Remote Synchronization) tool.

This tutorial, focused exclusively on verification tests of the tool, is based on the synchronisation of a content folder with a PLAYER (Player ONE or Player ZERO) via a LINUX-based SSH server with a virtual machine on a Windows 11 PC as host.

**ECLER recommends using a virtual private server (VPS)** as a professional solution for the implementation of Store and Forward.

From now on, in this tutorial, we will use the word PLAYER to refer to both the Player ONE and Player ZERO models.

## d ecler

#### 2. INSTALLING SSH ON LINUX VIA VIRTUAL MACHINE ON PC

This functionality may require IT knowledge, so **we recommend enlisting the support** of a specialised technician.

To set up cloud-based Store and Forward, a VPS (Virtual Private Server) service **must be contracted** to obtain a public IP and access the SSH server via the Internet.

Before putting this tutorial into practice, we recommend reading it beforehand to avoid implementation errors.





#### 2.1 Tools Required

#### • VIRTUALBOX Oracle Software.

On a PC with Windows 10 or 11, download and install the VirtualBox software with administrator permissions to create a Linux-based virtual machine; this will allow generation of the SSH server that will manage the Rsync synchronisation with the PLAYERS on the Network.

#### UBUNTU O.S.

Download the Ubuntu operating system (the LTS version).

#### Click on the corresponding image to access the desired tool:





via virtual machine
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#### 3. VIRTUAL MACHINE INSTALLATION (VIRTUAL BOX)

We are going to load the UBUNTU operating system in the VirtualBox virtual machine.

1. Open VirtualBox as an Administrator and click "NEW".



2. Name: enter a name for the virtual machine.
Machine Folder: indicate the folder location.
Type: indicate the system type (Linux.)

🗿 Oracle VM VirtualBox Manager		– 🗆 🗙
File Machine Help		
Tools §		
	Name and operating system     Name and operating system     Please choose a descriptive name and destination folder for the new virtual     machine and select the type of operating system you intend to install on it.     The name you choose will be used throughout VirtualBox to identify this     machine.	ed
	Name: Store and Forward (Rsync)	
	Machine Folder: C: Users \e.balsells \VirtualBox VMs	
	Type: Linux 🔹 🛀	
	Version: Ubuntu (64-bit)	
	Expert Mode Next Cancel	

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**3.** In the next step, we indicate **the main memory (RAM)** that our **virtual machine** will have. **This should be set to 2GB (2048MB)**.

2

← Create Virtual Machine			
Memory size			
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The recommended memory size is	1024 MB.		
		11111	2048 🖨 MB
4 MB		8192 MB	
		Next	Cancel

**4.** Now **we will create a "virtual" hard disk**, which will essentially be a folder that will occupy space on the physical hard disk dynamically.

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<form><form></form></form>		Hard disk	
<form><ul> <li>In the second second</li></ul></form>		If you wish you can add a virtual hard disk to the new machine. You can either create a new hord disk file or select one from the list or from another lonation uring the fibiter icon.	
In the recomendation of the the date is 12.00 CM   In the recomendation of the the date is the implementation of the recomendation of the recomendat		If you need a more complex storage set-up you can skip this step and make the changes to the machine settings once the machine is created.	
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(Virtual Hard Disk)       again automatically when space on it is freed.         < (Virtual Machine Disk)	(VirtualBox Disk Image)	hard disk as it fills up (up to a maximum <b>fixed size</b> ), although it will no	ot shrink
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○ Fixed size		O Dynamically allocated	
		Fixed size	
Expert Mode Next Cancel Next Cancel	Expert	Mode Next Cancel Next	Cancel



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We must also **indicate** the **usable space limit that we wish to apply;** in this particular case we will use a 30GB limit.

		?	$\times$
Create Virtual Hard Disk			
File location and size			
Please type the name of the new on the folder icon to select a diffe	virtual hard disk file into the bo erent folder to create the file in	ox below	or click
\VirtualBox VMs\Store and forware	d (Rsync)\Store and forward (R	lsync).vd	li 🔼
Select the size of the virtual hard amount of file data that a virtual	l disk in megabytes. This size is machine will be able to store or	the limit of the hard	on the d disk.
	· · · · · · · · · · · ·	30	,00 GB
4,00 MB	2.00 TR		
	2,00 10		
	2,00 10		
	2,00 15		
	2,00 18		
	2,0010		
	2,0010		

Our virtual machine overview is almost ready, now we must **configure it.** 

	- D X
<u>∞</u> <u>•</u>	
New Target Det General Name: System Base Menoy: 204 M6 Bool Offer: Fory, Optical, Hard Dak Acceleration: YF-U/AD-V, Nested Paging, PAE,RAV, KM Paravirtualization	Store and forward (Rsync)
to and Management is Net Concerning and the Second Se Second Second Seco	
Controler: Doc (Controler: Controler: Controler: Controler: SATA     Start Arev to: Store and forward (Reync).vd (Normal, 30,00 GB)	
Audio Hot Diver: Windows DirectSound Controler: LON ACS7	
Retwork Adapter 1: Intel PRO/1000 MT Desktop (NAT)	
Ø USB USB Controller: OHCI Device Filters: 0 (0 active)	
Shared folders	
Bescription	
None	



5. The following menu will appear, in which you must:

**Place the cursor over "Storage",** click **the right mouse button** and **select "Empty**". A drop-down menu will open and **in Attributes, click on the blue disk to the right** of "Optical Drive".

8	General	Storage				
0 Tools	System	Storage Devices	Attributes			
Store and Forward	Display	Controller: IDE	Optical Drive:	IDE Secondary Device 0	0	
Powered Off	C Starrage	Empty		Live CD/DVD		Choose/Create a Virtual Optical Disk
	Storage	Controller: SA	Information	2		Choose a disk file
	Audio	Store an Inc. St	NC).vd Size:	-	C	Remove Disk from Virtual Drive
	Netwo		Location:	-		
	Serial P		Attached to:	-		
	Shared Folders					
	User Interface					
		🔥 💩	(23) 🗃			

Locate the Ubuntu file you downloaded earlier and click "Open".

Please choose a	virtual opti	cal disk file				×
$\leftrightarrow$ $\rightarrow$ $\sim$ 1	•	Escritorio > RSYNC		~	C Q BU	uscar en RSYNC
Organizar 🔻 🛛 🕅	Nueva carp	eta				≣ ▾ 🔲 💡
> 🔷 OneDrive - I	Pers	Nombre	Fecha de modificación	Тіро	Tamaño	
	- 1 1	Jubuntu-22.04.1-desktop-amd64	05/01/2023 17:54	Archivo de image	3.737.140 KB	
Escritorio	*					
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Documento	s,≉					
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🕖 Música	*					
Vídeos	*					
RSYNC						
> 🔷 OneDrive						
	Nombre	ubuntu-22.04.1-desktop-amd64			~ All virtu	al optical disk files (*.dr $  imes $
					Ak	orir Cancelar



Once the file is loaded, click OK.

Tools	General	Storage					
Store and Forward	System       Display       Storage       Audio       Network       Serial Ports       USB       Shared Folders       User Interface	Storage Devices Controller: IDE Ubuntu-22.04, 1-desktop-amd6 Controller: SATA Store and Forward (RSYNC).vd	Attributes Optical Drive: Information Type: Size: Location: Attached to:	IDE Secondary Device 0	RSYN		
				OK Can	cel		

6. Virtual machine NETWORK configuration.

In this step we will configure the network adapter to create an additional physical network to the one present on the PC, which will be used in Ubuntu where the SSH Server will be hosted.

We recommend configuring the associated network on the PC you are using with a FIXED IP rather than a dynamic one (DHCP).

The Router must be correctly configured in DHCP mode, so that it assigns a different IP to that of the PC, which will be the one used by the Virtual Machine.

We recommend using a wired network to the configured PC, with no additional network or WiFi active during this process.

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In the **Configuration menu**, select **"Network"** and under **Adapter 1**, check **"Enable Network Adapter"** to enable it.

Next, in the "Attached to" drop-down list, select "Bridged Adapter", and in "Name", select your wired network card.

Lastly, click OK.



**7.** The last step to enable a Linux operating system in the virtual machine is the **installation of the operating system**.

To start the installation, **select "Start" after checking the previously configured virtual machine.** 



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The following screen will appear; select "Try or Install Ubuntu" then press ENTER.



The system will load and the operating system configuration menu will open.



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#### Select the language and then select "Install Ubuntu".



Select the keyboard layout language and click continue.



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The "Updates and other software" screen will appear; select "Minimal installation" and "Download updates while installing Ubuntu" and click Continue.

Machine view input Devices Help		
have the Auto capture keyboard option turned on.	This will cause the Virtual Machine to automatically capture the keyboard every time the Mar 16 15:14	VM 🙁
	Install	
Updates and other softw	ware	
What apps would you like to install to	start with?	
O Normal Installation		
Web browser, utilities, office software, game	is, and media players.	
Minimal installation		
Other options		
Download undates while installing Lib		
This saves time after installation.		
	ine and with the solution and additional modia. So see to	
This all chird-party sortware for graph	ics and within down orbition for a doubtional media formats	
This sortware is subject to license terms inclu	lded with its documentation. Some is proprietary.	

On the next screen that appears, select the type of installation. **Select "Advanced Features".** 

A new window will open, select **"None"** and click **OK and** then click on **"Install** now".



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#### An information box will appear, click "Continue".



Enter your location and click "Continue".



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Create your user profile and password and click "Continue".

	Install		
Who are you?			
Your name	Tech-Support	0	
Your computer's name	<b>techsupport-VirtualBo</b>		
Pick a username	tech-support		
Choose a password	Fair password		
Confirm your password	••••••		
	C Log in automatically		
	Use Active Directory		
	You'll enter domain and other details in the next step.		
		Dark	Castinua

At this point the installation of the Ubuntu operating system will begin.







Once finished, you will be prompted to reboot. Press "Enter".

The programme will restart and will ask for the **user password**, type it and **press** "Enter".



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Activities	Settings		mar 31 12:54	A 🗣 U
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	) Network			
	Bluetooth		Wired	+
	Background		Connected - 1000 Mb/s	
	P Appearance		VPN	+
?	Notifications		Not set up	
	2 Search			
•	D Multitasking		Network Proxy	Off
	Applications	$\rangle$		
	Privacy	>		
<b>\$</b>	Online Accounts			
~	° Sharing			
1	Sound			

8. You will now need to configure the NETWORK in Ubuntu.

The next step is to configure a fixed IP according to the network where the configured PC is connected, which will be a "new" physical fixed IP as explained above. Finally, click on "Apply".

**I** The physical IP must not be the same as the one used by your Windows computer.

Q		Settings =		Network	-	
6 N	Netv	Cancel	Wired		Apply	] .
₿ E	Blue	Details Identity	IPv4 IPv6 Security			+
Ç e	Back	IPv4 Method	🔵 Automatic (DHCP)	C Link-Local Only	1	
P 4	Арре	l	Manual Shared to other computers	O Disable		+
Û Î	Noti	Addrossor				
Q 9	Sear	Address	Netmask	Gateway		
01	Mult	192.168.0.67	255.255.255.0	192.168.0.1		
	Аррі					
A F	Priva	DNS		Automatic		
△ (	Onlir	Separate IP addresses w	ith commas			
≪° 5	Shar	9			-	



Next, you will need to restart Ubuntu.



Finally, once rebooted, **log back in with your username and review the network configuration in detail** to make sure that it has been applied correctly.



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#### 4. INSTALLING SSH SERVER ON LINUX

Activities	mar 14 17:25	A 🐠 🕛
<b>6</b>	Q terl 🛛	
	>_	
	Terminal	
0		
Settings	Printers Add printers, view printer jobs	and decide how you w
	<b>Color</b> Calibrate the color of your device	s, such as displays, ca…
	• Power View your battery status and cha	nge power saving setti
?	Network Control how you connect to th	e In <b>ter</b> net
Characters	Interlinear Annotation Termin U+FFF6	3, <mark>-</mark> : In <b>ter</b> linear Annot

It is necessary to **install the SSH package on Linux**. To do this, **type the following command** and **press ENTER**:

#### sudo apt-get install ssh

Activitie	es 🕑 Terminal	mar 14 17:37		÷ •)	Ċ
_	F	tech-support@techsupport-VirtualBox: ~	Q =		
• -	tech-support@techsu [sudo] password for	pport-VirtualBox:-\$ sudo apt-get inst tech-support:	all ssh		
0					

Next, type the password that will be requested and then press ENTER.

Linux has its own security system that does not allow the password you type to be displayed, although it does process it.

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Once the command has been processed after entering the password, **type "y" in lowercase** and then press "**Enter**".



The following screen will appear:



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Install SSH

#### 5. GENERATING SSH KEYS

It is very important to perform this step correctly; please pay attention before processing the data.

In this example we will use the administrator username: Tech-Support.

Use the command ssh-keygen -m PEM to generate the keys and press ENTER directly in response to each question (without typing anything).

tech-support@techsupport-VirtualBox:~\$ cd
tech-support@techsupport-VirtualBox:~\$ ssh-keygen -m PEM
Generating public/private rsa key pair.
Enter file in which to save the key (/home/tech-support/.ssh/id\_rsa):

Without typing anything, press the ENTER key 3 times, i.e. leaving the fields for:

- 1. "enter file in which...", press ENTER.
- 2. "enter passphrase...", press ENTER
- 3. "enter same passphrase...", press ENTER.

Enter file in which to save the key (/home/tech-support/.ssh/id\_rsa): Enter passphrase (empty for no passphrase): Enter same passphrase again:

At this point, the public keys will be generated and displayed on the screen.





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Add the public keys to the authorised keys with the following command and then press ENTER:

#### cat .ssh/id\_rsa.pub >> .ssh/authorized\_keys

You may view the private key that you need to enter in the Store and Forward configuration page of the PLAYER:

#### cat.ssh/id\_rsa

Copy the complete text, from "----BEGIN RSA..." by dragging the cursor to the end, to "...PRIVATE KEY-----".





To save it, open the "Text Editor" application.



Click the right mouse button, paste the copied text and save it in the Documents folder.

We advise you to send this file by email or keep it at hand so that you may paste the key as detailed in the S&F section of the PLAYER.

Cancel	Name	SSH KEY			Q	Save
යි Home	<	습 tech-support	Document	s SSH	IKEY >	[£7]
Documents	Nam	e	$\sim$	Size	Туре	Modified
⊕ Downloads		Untitled Document	1	2,5 kB	Private Key in PEM format	16:21

We also advise you to **copy and paste the keys into a txt. file to have them at hand when you implement them in the PLAYER,** as the default location will be the following: Username Admin home/.ssh

Please do not touch or edit the original files.

If you want to apply **multiple users with different content groups**, we recommend that you **refer to the Content Groups section of the** <u>Player One</u> or <u>Player Zero</u> user manual .

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Store & Forward module (Rsync)



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#### 6. SSH KEY ADAPTATION TO LATEST UBUNTU VERSION

#### New versions of Linux have made the RSA algorithms used by PLAYERS obsolete.

The PLAYER Store & Forward LOG will display an error message as follows:

'tmp/saf-dropbear.key'
upport
8.0.67
cuments/bgm
isb/
to Tach Support 2102 168 0 67:22 ovitad: No matching also hostkou
555

In this case, to allow the execution of PLAYER RSA, it is necessary to modify the server configuration.

To resolve this quickly, use the following command in the server terminal:

sudo sh -c 'echo "HostKeyAlgorithms +ssh-rsa" >> /etc/ssh/sshd\_config'

sudo sh -c 'echo "PubkeyAcceptedAlgorithms=+ssh-rsa" >> /etc/ssh/sshd\_config'

sudo systemctl restart sshd



#### 7. ADDING AUDIO CONTENT TO THE SSH SERVER.

The next step is to **place the audio content on the SSH server for each specific user or content group**. A folder will thus be created in the main directory of each content group in order to have music media compatible with the PLAYER, which you may host in the folder to be synchronised and which may be transferred via online downloads, email, links, etc.

For example, you may create a download link to a cloud-based file platform containing such media. Example path: home/documents/bgm/

You can use the Firefox browser to download it.

**Remember to have Ubuntu connected to the network with Internet access,** as without an Internet connection you will not be able to launch the content synchronisation.

#### 8. IMPLEMENTING S&F (Rsync) IN SSH

HOST (the host is the IP address of the SSH server so that it can be indicated to the PLAYER

In the case of **an external connection, you may need an IT technician to access the PLAYER through the communication port;** please provide that person with the necessary information, such as the IP address of the Host or MAC address of the device.

The following steps will describe how to get the necessary information for later entry into the PLAYER.

#### 1. How do I determine the IP address of the Host?

First, you need to install the network package.

- Open the terminal application.
- Type: sudo apt install net-tools and press ENTER.
- Enter the password ADMIN (not visible) and press ENTER.



• In the terminal, type: Ifconfig and press ENTER





The IP of the SSH server in this example is the same as the one we configured <u>earlier</u>. In our example: 192.168.0.67.

To avoid transcription errors, we recommend that you take a **screenshot of the data**, which you must provide to the IT technician in charge of maintaining the network where the PLAYER is installed.

#### 2. Communication port

**By default it is number 22 in the SSH servers,** but if the IT technician advises that you cannot use this port where the PLAYER is located, they must tell you the port that you can use to enter the number in the S&F module of the PLAYER, as well as to authorise the complete connection of the IP Host (SSH server).

#### 3. Folder

Where the SSH server's music media are located.

We recommend avoiding names with capital letters or symbols.

In our example: /home/tech-support/Documents/bgm/

- "tech-support" is the user name,
- "bgm" is the name of the folder we choose and must always be included in the path.

**Linux differentiates between UPPERCASE and lowercase letters**. If the path is entered incorrectly, the synchronisation will not be performed and will return an error in the LOG.





#### 4. Username

You must **enter the user with which you configured the virtual machine**, in this case the user ADMIN: tech-support

#### 5. Private key

You must **access the txt. file into which you copied the key** that you generated in our SSH Server.

#### 9. STORE AND FORWARD MODULE (Rsync)

Now that you have all the **necessary data** to implement the configuration, **you will implement it in the S&F module of your PLAYER**.

re and Forward (rsync)	
&Forward module lets DEVICE download remote m	edia content to local storage devices (USB/MMC), daily, and recal PRESET1 to automatically play it.
General Remote Source Local Target Lo	og
	Host
	Host or IP Address
	Port 22
	Folder
	Host Folder where contents are stored
Use	ename
Prive	ate Kay
	Ø
	Put (copy8paste) here the Private RSA/OPENSSH key
τ	imeout 10
	Timeout in seconds (5.30)

#### 1. General

Store and Forward (rsync)		
. , ,		
Store&Forward module lets DEVICE download remote me	edia conter	nt to local storage devices (USB/MMC), daily, and recall PRESET1 to automatically play it.
General Terrrote Source Local Target Log	9	
En	nabled	8
		Check this option to enable daily Store&Forward process
	Time	08 v : 30 v
		Time (HHMM) when synchronization will be executed
		Audio pisybets, will be interrupted
		SAME DESET

SAVE

- **Enabled**: In this section, activate the S&F Module (Rsync) by checking the box.
- **Time:** this is a **very important** point, it is where the exact time of media synchronisation between our SSH server and the PLAYER is configured so that Rsync does the rest automatically.
- Next, please press

It is very important that both the PLAYER and the SSH server have continuous network access during media synchronisation. Otherwise, the LOG module will show a synchronisation error message.



#### 2. Remote Source

Lastly, you must fill in all the data previously covered in this section.

ore and Forward (rsyn	c)	
re&Forward module lets DEVICE download remo	te media cont	ent to local storage devices (USB/MMC), daily, and recall PRESET1 to automatically play it.
General Remote Source Local Target	Log	
	Host	192.168.0.67
		Host or IP Address
	Port	22
	Folder	/home/tech-support/Documents/bgm/
		Host Folder where contents are stored
	Username	tech-support
	errväte Key	Introduction of the constraint of the constra
	-	· · · · · · · · · · · · · · · · · · ·

Make sure that all parameters are entered correctly.				
Remember to press SAVE when you have	finished	configuring		
each tab.		5 5		
For your convenience, <b>you can resize the</b> "private	P+A9BQ			
key" <b>text field</b> to your liking	tihiRX			
	9eZ7zW			
	nv6Gie			
	The providence of the			

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#### In our example:

- Host: 192.168.0.67
- Port: 22
- Folder: /home/tech-support/Documents/bgm
- Username: tech-support
- Private Key: That you saved previously.
- Timeout: 25 sec.
- 3. Local Target

In this section, **you will indicate where Rsync will synchronise the files it receives from the SSH server**, either on a USB stick or SD card inserted in the PLAYER, in FAT32 format.

a) Indicate the Path you wish to use, which you will later configure in the associated PRESET1. In this example: usb://

Store and Forw	vard (r	Sync) ad remote media content to local storage devices (USB/MMC), daily, and recall PRESET1 to automatically play it
General Remote Source Le	ocal Target Path	Log usb//
		Defined by PRESET1 Playlist Path field
		SAVE

**b) PRESET 1 of our PLAYER** is configured, so that the files from our USB or SD can be played.

PRESET01	
<pre>Please, select the parameters to be saved in the preset. You can select the source from different locations. Examples: usb:// airplay:// dlna:// http://treaming.service.xyz usb://my_playlist.mlu mmc://myinectory/sample.ogg</pre>	
Name Enabled Events Playlist Media alias <u>Source path / url</u> Play status	LOAD PRESET Rsync (USB) GPI1 GPI2 SILENCE Rsync (USB) usb:// LAY

Store & Forward module (Rsync)



c) Press SAVE	to save the Preset.
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d) You must check that all the parameters are correctly saved, that the SSH server is operating and that there are no power settings that might disable it.

💡 We recom	imend leaving "A	Automatic login" enabled in Ubuntu
?	📋 Removable Media	Authentication & Login
	🛞 Color	Password ····· >
•	Region & Language	Automatic Login
	🕯 Accessibility	
	涣 Users	Account Activity Logged in >
0	★ Default Applications	

e) Restart the PLAYER.

d ecter		PLAYERONE
Device	$\sim$	Reboot
Network	$\sim$	Reboots the operating system of your device
System	^	
Name and time		PERFORM REBOOT
Security		
Backup, Restore and Firmw	are	
USB/MMC Settings		· · · · · · · · · · · · · · · · · · ·
Register		
Reboot		

The S&F module starts automatically and will start to dump and playback the contents to the storage previously indicated.

💡 Example of	display in Player (	<b>DNE</b> (Player ZERO	does not have a
display and must t	herefore be monitor:	ed via the Web Ap	o).
decler 24	decler 24	decler 24	decler 24
PLAYER ONE PLEASE WAIT	PLAYERONE LOADING	RUNNING S&F	Year Of Tha Boom ▶03:56 Ø USB

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f) Lastly, check the PLAYER's LOG to make sure that everything is correct.



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