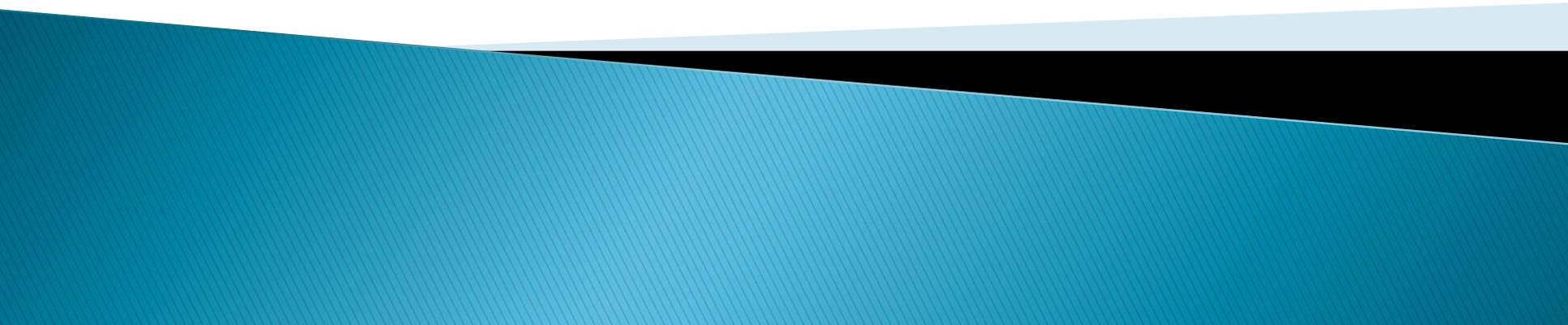


Trasformare una singleboard in un NAS

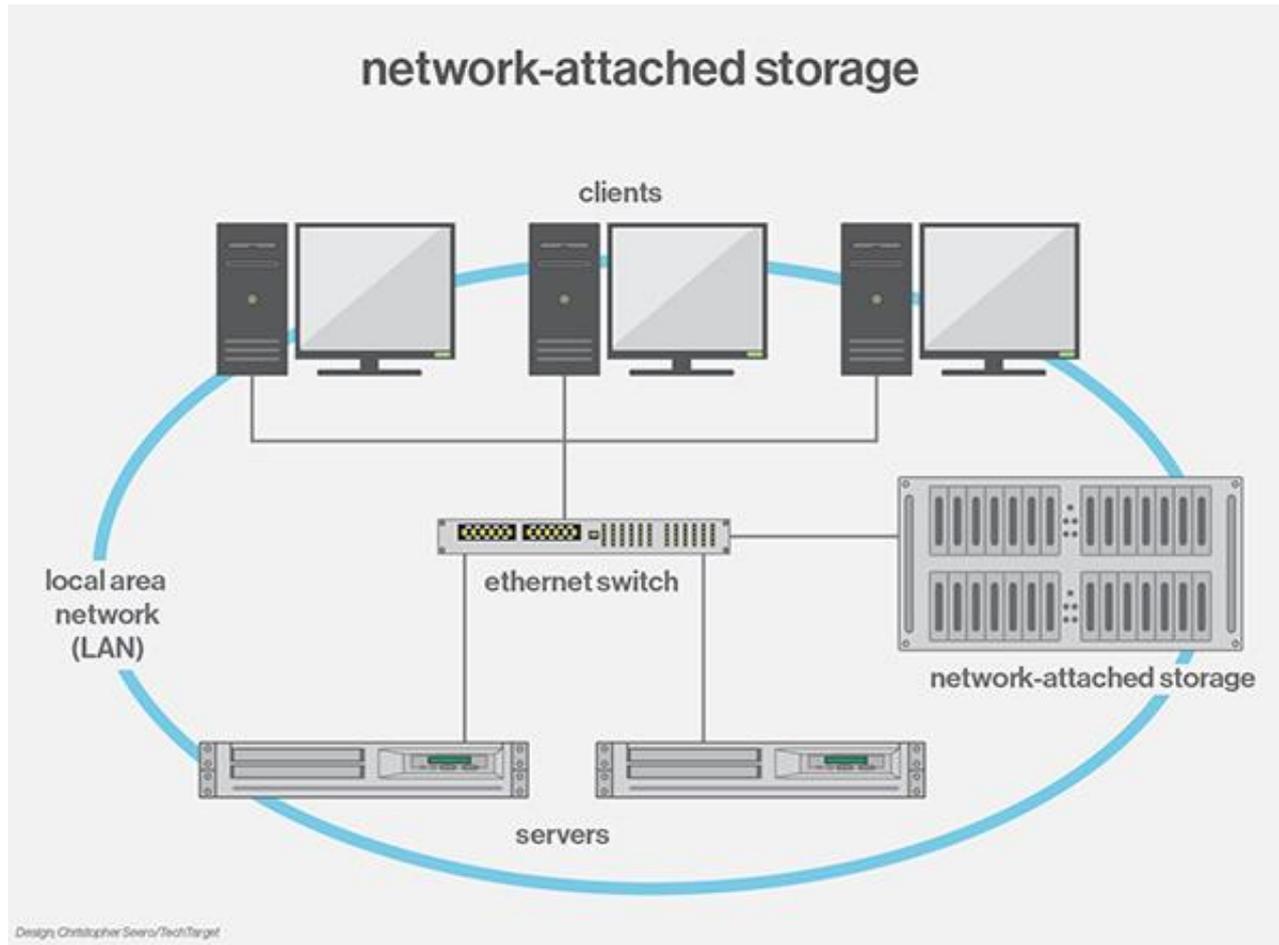
Carlo Alberto Trisciuzzi



Cos'è un NAS?

- ▶ Un *Network Attached Storage* (NAS) è un dispositivo collegato alla rete la cui funzione è quella di consentire agli utenti di accedere e **condividere una memoria di massa**, in pratica costituita da uno o più dischi rigidi, all'interno della propria rete o dall'esterno.
(da Wikipedia)

Com'è fatta una rete con un NAS?



Quali sono i vantaggi?

- ▶ Immagazzinamento centralizzato dei dati in un solo dispositivo accessibile a tutti i nodi della rete;
- ▶ Implementazione di schemi RAID, che permette di gestire la sicurezza dei dati.

Cos'è una single-board (SBC)?

- ▶ Un *Single-Board Computer* (SBC) è una scheda elettronica che implementa un intero computer (o quasi).
- ▶ Un esempio? Il famosissimo Raspberry Pi!

Distro per fare da NAS

- ▶ FreeNAS: basata su FreeBSD, veramente ricco di features, per utenti esperti;
 - ▶ OpenMediaVault: basata su Debian Linux, pensata per casa e piccoli uffici;
 - ▶ NAS4Free: continuazione del progetto legacy di FreeNAS;
 - ▶ Openfiler: solida distro Linux/based, focalizzata sull'uso enterprise;
 - ▶ SME Server: basata su CentOS, fornisce vari servizi, pensata per piccole e medie imprese.
- 

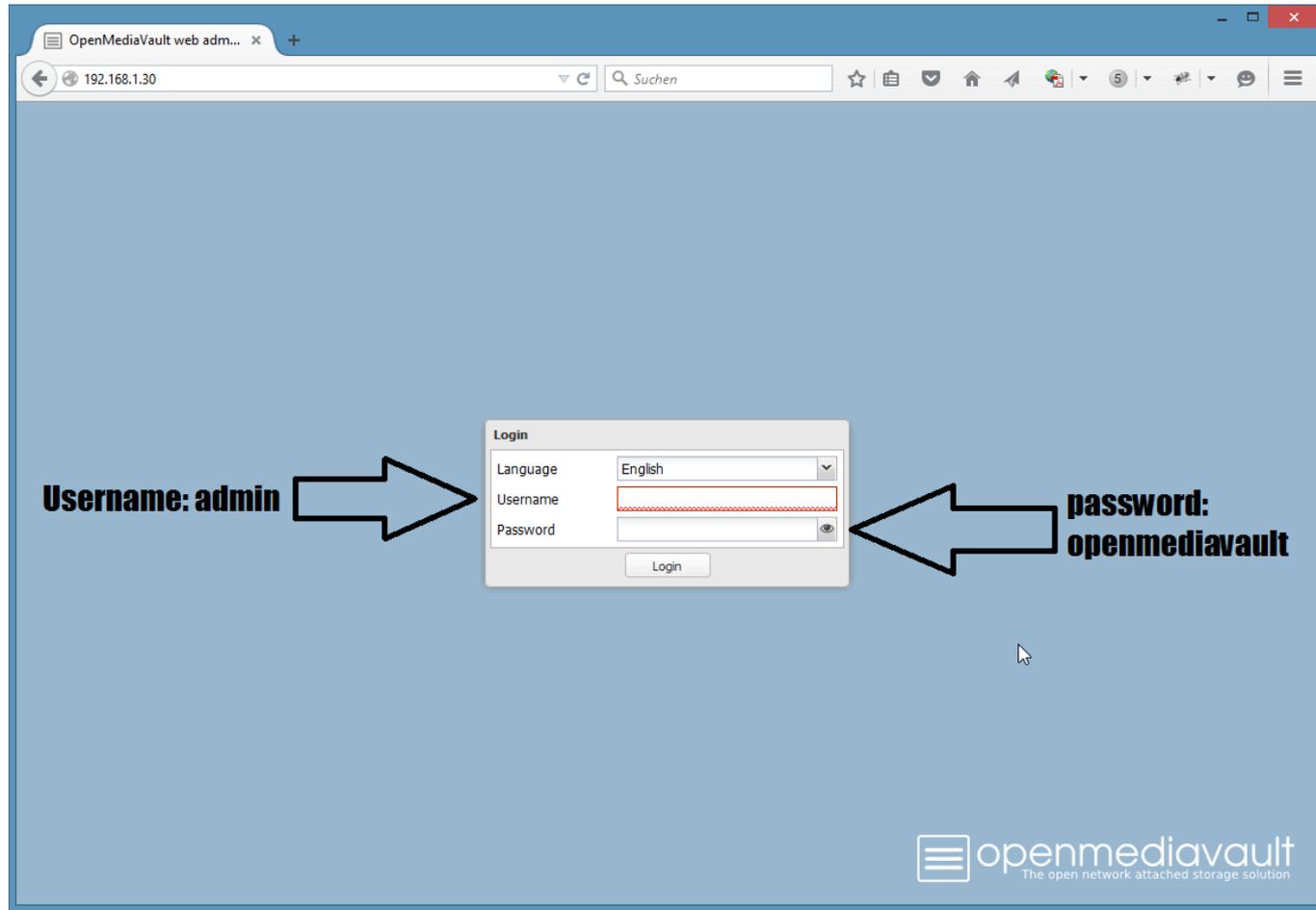
Odroid HC1 – SBC per fare da NAS



Odroid HC1 – Caratteristiche

- ▶ Variante dell'Odroid XU4, per fare da NAS.
 - ▶ Samsung Exynos5422;
 - ▶ 2GB LPDDR3 RAM;
 - ▶ Porta SATA da 2,5'';
 - ▶ Porta Ethernet;
 - ▶ Porta USB 2.0;
 - ▶ Slot microSD UHS-1;
 - ▶ Supporto ad OpenMediaVault.
- 

Passo 0: Schermata di Login!



Ecco l'Index!

The screenshot displays the OpenMediaVault web administration interface. The browser address bar shows the URL 192.168.1.30. The page header includes the OpenMediaVault logo and the tagline "The open network attached storage solution". The main content area is divided into a left sidebar and a main panel. The sidebar contains a tree view of system settings, including System, Storage, Access Rights Management, Services, and Diagnostics. The main panel shows the "Service status" and "System information" sections.

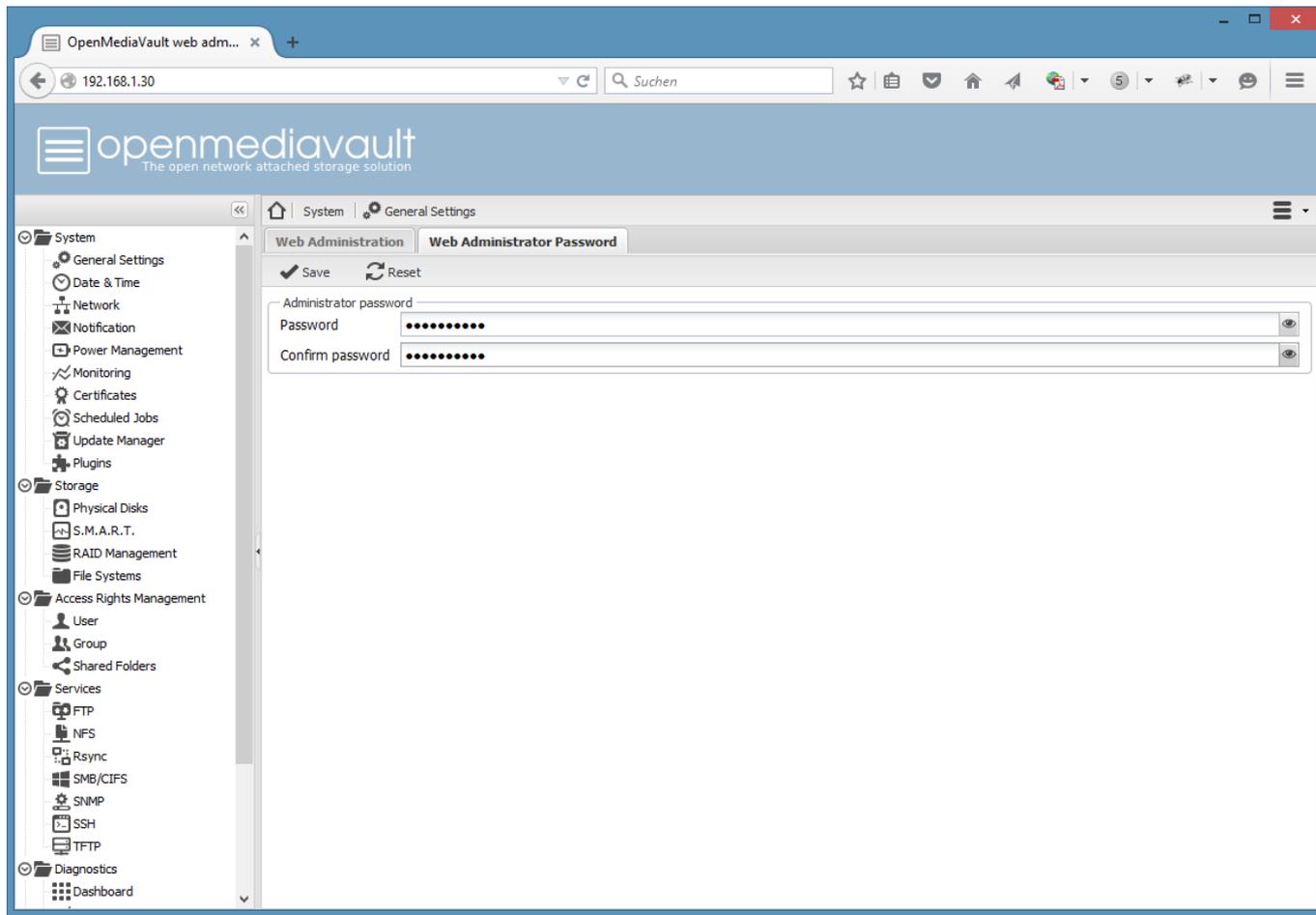
Service status

Service	Enabled	Running
FTP	<input type="checkbox"/>	<input type="checkbox"/>
NFS	<input type="checkbox"/>	<input type="checkbox"/>
RSync server	<input type="checkbox"/>	<input type="checkbox"/>
SMB/CIFS	<input type="checkbox"/>	<input type="checkbox"/>
SNMP	<input type="checkbox"/>	<input type="checkbox"/>
SSH	<input type="checkbox"/>	<input type="checkbox"/>
TFTP	<input type="checkbox"/>	<input type="checkbox"/>

System information

Hostname	openmediavault.local
Version	2.1 (Stone burner)
Processor	Intel(R) Core(TM) i7-3517U CPU @ 1.90GHz
Kernel	Linux 3.2.0-4-amd64
System time	Fri 31 Jul 2015 07:25:49 AM EDT
Uptime	0 days 1 hour 32 minutes 56 seconds
Load average	0.00, 0.01, 0.05
CPU usage	<div style="width: 3%;"><div style="width: 3%;"></div></div> 3%
Memory usage	<div style="width: 4%;"><div style="width: 4%;"></div></div> 4% of 1.96 GiB

Passo 1: Cambio Password!



Passo 2: Abilitare il FTP!

The screenshot displays the OpenMediaVault web administration interface. The browser address bar shows the URL 192.168.1.30. The page title is "OpenMediaVault web adm...". The main header features the OpenMediaVault logo and the tagline "The open network attached storage solution".

The left sidebar contains a navigation menu with the following categories and items:

- Network
- Notification
- Power Management
- Monitoring
- Certificates
- Scheduled Jobs
- Update Manager
- Plugins
- Storage
 - Physical Disks
 - S.M.A.R.T.
 - RAID Management
 - File Systems
- Access Rights Management
 - User
 - Group
 - Shared Folders
- Services
 - FTP
 - NFS
 - Rsync
 - SMB/CIFS
 - SNMP
 - SSH
 - TFTP
- Diagnostics
 - Dashboard
 - System Information
 - System Logs
 - Services

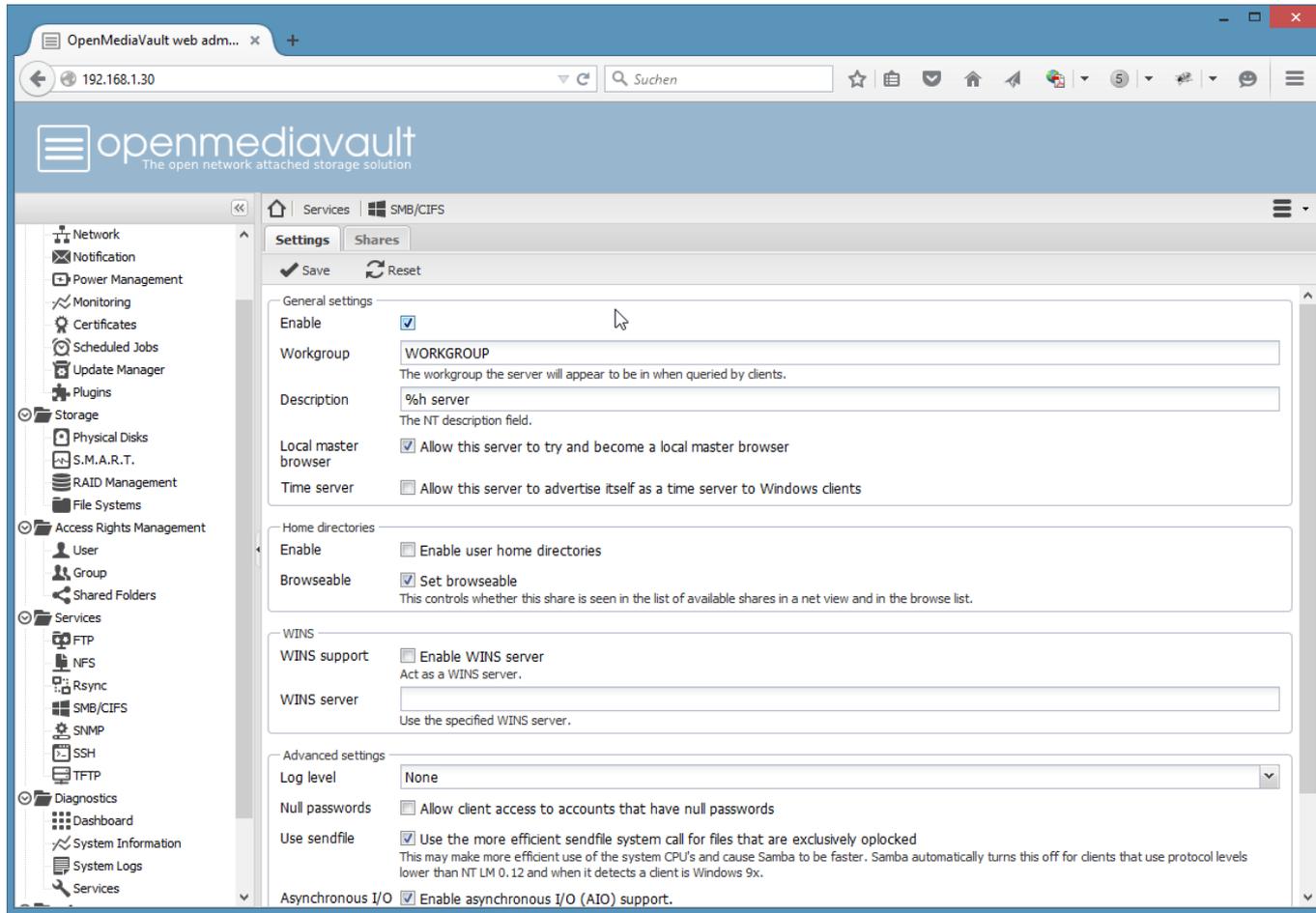
The main content area is titled "Services" and "FTP". A yellow warning banner at the top states: "The configuration has been changed. You must apply the changes in order for them to take effect." Below this banner are buttons for "Apply" (with a checkmark) and "Revert".

The "Settings" tab is active, showing the following configuration options:

- Settings** (selected), SSL/TLS, Ban list, Shares
- Save, Reset
- General settings**
 - Enable:
 - Port: 21
 - Max. clients: 5 (Maximum number of simultaneous clients.)
 - Max. connections per host: 2 (Maximum number of connections per IP (0 = unlimited).)
 - Max. login attempts: 1 (Maximum number of allowed password attempts before disconnection.)
 - Timeout: 1200 (Maximum idle time in seconds. Setting idle timeout to 0 disables the idle timer completely (clients can stay connected for ever, without sending data).)
 - Anonymous FTP: Enable anonymous FTP
 - Welcome message: (Text input field)
- Advanced settings**
 - Permit root login: Specifies whether it is allowed to login as superuser directly
 - Require valid shell: Deny logins which do not have a valid shell
 - Bandwidth restriction: Use the following bandwidth restriction:
 - Maximum upload rate (KB/s): 0 (0 KB/s means unlimited.)
 - Maximum download rate (KB/s): 0 (0 KB/s means unlimited.)

At the bottom right of the settings area, there is a button labeled "Apply configuration changes".

Passo 3: Abilitare SMB/CIFS!



The screenshot displays the OpenMediaVault web administration interface. The browser address bar shows the URL `192.168.1.30`. The page title is "OpenMediaVault web adm...". The main header features the OpenMediaVault logo and the tagline "The open network attached storage solution".

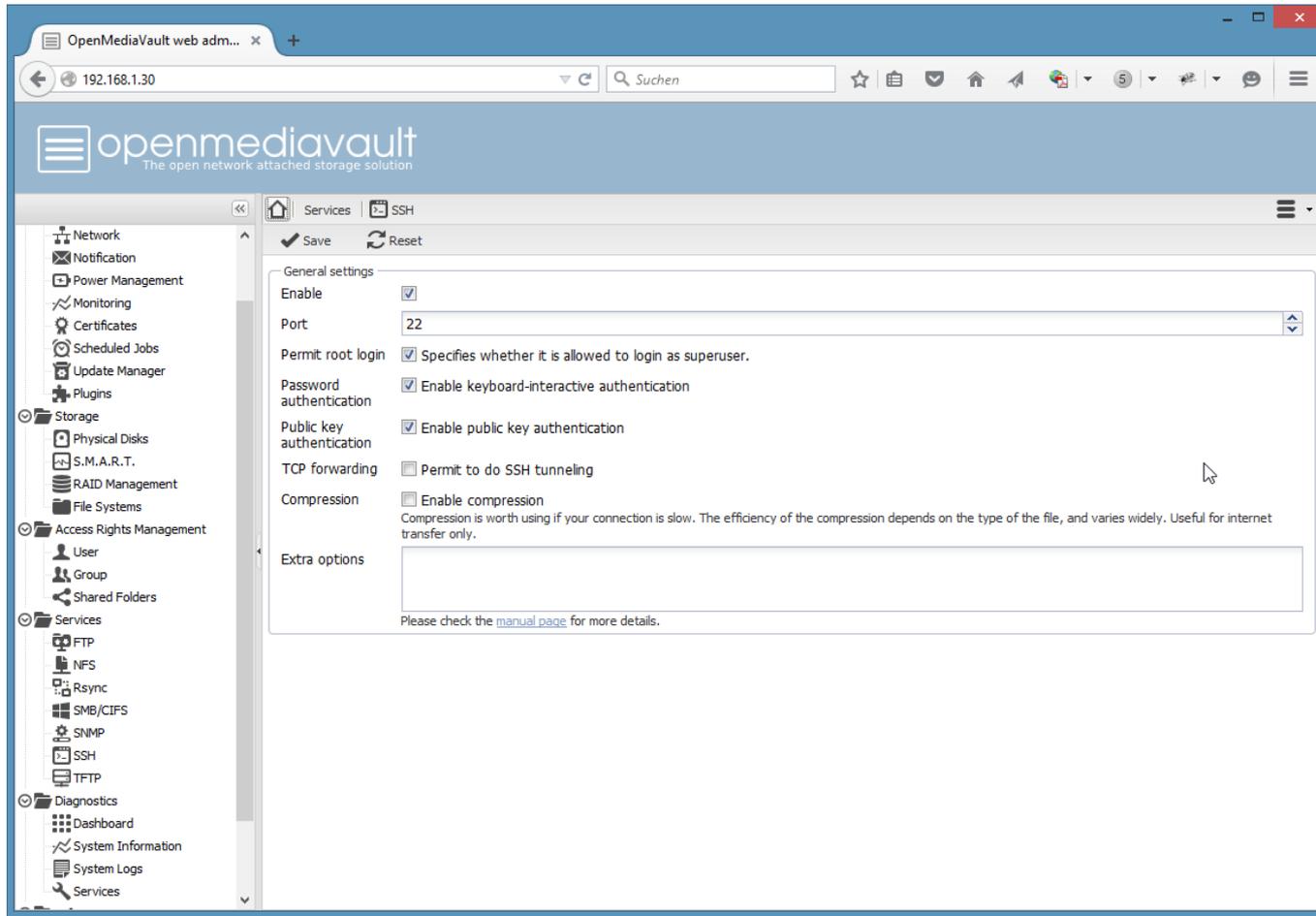
The left sidebar contains a navigation menu with the following categories and items:

- Network
- Notification
- Power Management
- Monitoring
- Certificates
- Scheduled Jobs
- Update Manager
- Plugins
- Storage
 - Physical Disks
 - S.M.A.R.T.
 - RAID Management
 - File Systems
- Access Rights Management
 - User
 - Group
 - Shared Folders
- Services
 - FTP
 - NFS
 - Rsync
 - SMB/CIFS
 - SNMP
 - SSH
 - TFTP
- Diagnostics
 - Dashboard
 - System Information
 - System Logs
 - Services

The main content area is titled "Services" and "SMB/CIFS". It has two tabs: "Settings" (selected) and "Shares". Below the tabs are "Save" and "Reset" buttons. The settings are organized into several sections:

- General settings**
 - Enable:
 - Workgroup:
The workgroup the server will appear to be in when queried by clients.
 - Description:
The NT description field.
 - Local master browser: Allow this server to try and become a local master browser
 - Time server: Allow this server to advertise itself as a time server to Windows clients
- Home directories**
 - Enable: Enable user home directories
 - Browseable: Set browseable
This controls whether this share is seen in the list of available shares in a net view and in the browse list.
- WINS**
 - WINS support: Enable WINS server
Act as a WINS server.
 - WINS server:
Use the specified WINS server.
- Advanced settings**
 - Log level:
 - Null passwords: Allow client access to accounts that have null passwords
 - Use sendfile: Use the more efficient sendfile system call for files that are exclusively olocked
This may make more efficient use of the system CPU's and cause Samba to be faster. Samba automatically turns this off for clients that use protocol levels lower than NT LM 0.12 and when it detects a client is Windows 9x.
 - Asynchronous I/O: Enable asynchronous I/O (AIO) support.

Passo 4: Abilitare SSH!



The screenshot displays the OpenMediaVault web administration interface in a browser window. The address bar shows the URL `192.168.1.30`. The page title is "OpenMediaVault web adm..." and the search bar contains the text "Suchen". The OpenMediaVault logo and tagline "The open network attached storage solution" are visible at the top.

The left sidebar shows a navigation menu with categories: Network, Notification, Power Management, Monitoring, Certificates, Scheduled Jobs, Update Manager, Plugins, Storage (Physical Disks, S.M.A.R.T., RAID Management, File Systems), Access Rights Management (User, Group, Shared Folders), Services (FTP, NFS, Rsync, SMB/CIFS, SNMP, SSH, TFTP), and Diagnostics (Dashboard, System Information, System Logs, Services). The "SSH" service is selected.

The main content area shows the "SSH" configuration page. At the top, there are "Save" and "Reset" buttons. Below is the "General settings" section with the following options:

- Enable:** (checked)
- Port:** 22
- Permit root login:** Specifies whether it is allowed to login as superuser.
- Password authentication:** Enable keyboard-interactive authentication
- Public key authentication:** Enable public key authentication
- TCP forwarding:** Permit to do SSH tunneling
- Compression:** Enable compression
Compression is worth using if your connection is slow. The efficiency of the compression depends on the type of the file, and varies widely. Useful for internet transfer only.
- Extra options:** (Empty text area)

At the bottom of the settings area, there is a note: "Please check the [manual page](#) for more details."

Passo 5: Una nuova partizione!

The screenshot shows the OpenMediaVault web administration interface. The browser address bar displays '192.168.1.30'. The page title is 'openmediavault The open network attached storage solution'. The main content area is titled 'Storage | File Systems' and contains a table with the following data:

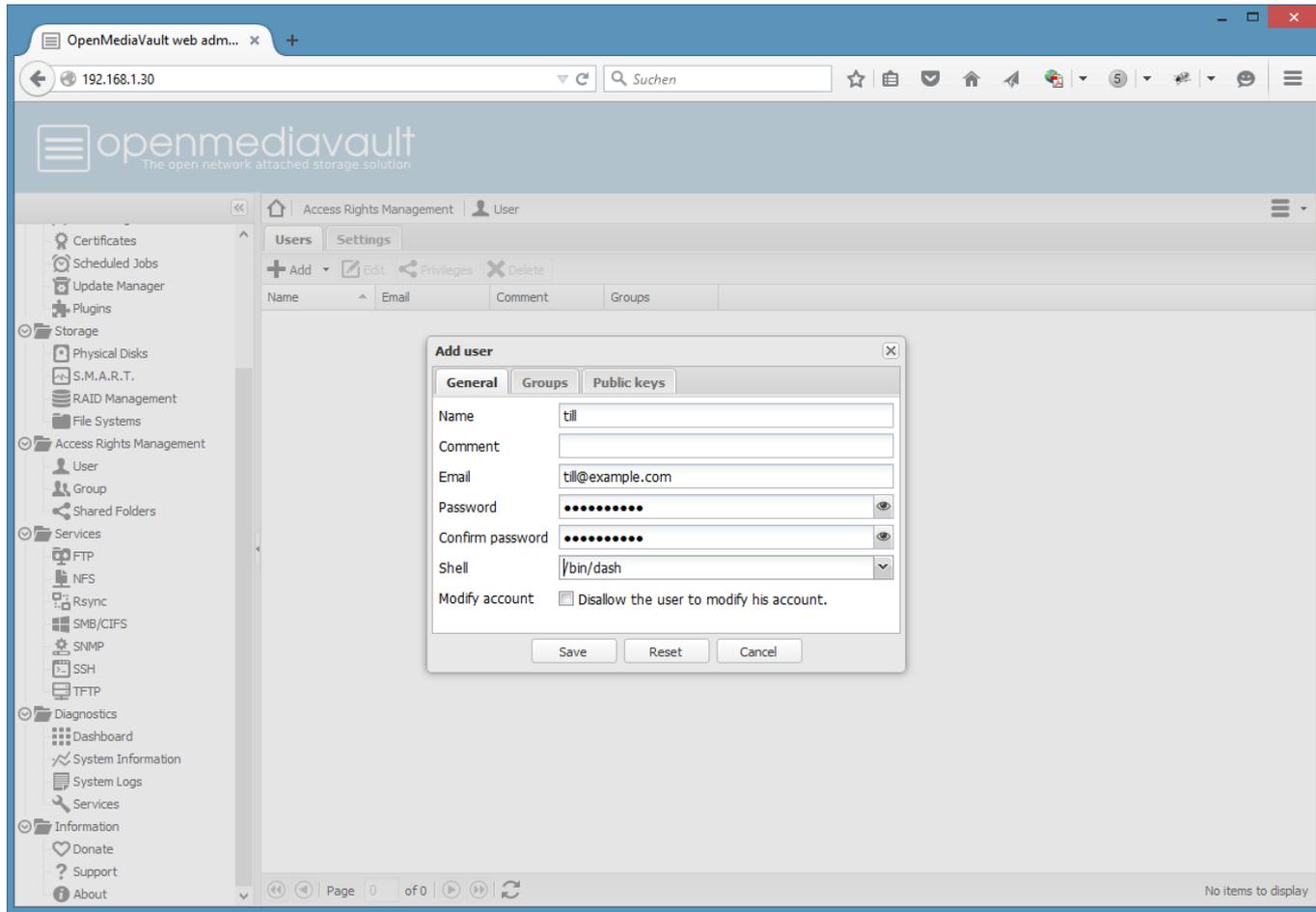
Device	Label	File system	Total	Available	Used	Mounted	Referenced	Status
/dev/sda1		ext4	28.28 GiB	25.86 GiB	1005.46 MiB	Yes	Yes	Online

A 'Create file system' dialog box is open, showing the following fields:

- Device: VMware Virtual S [/dev/sdb, 100.00 GiB]
- Label: data
- File system: EXT4

The dialog box has 'OK' and 'Cancel' buttons. The footer of the interface shows 'Page 1 of 1' and 'Displaying items 1 - 1 of 1'.

Passo 6: Un nuovo utente!



The screenshot displays the OpenMediaVault web administration interface. The browser address bar shows the URL `192.168.1.30`. The page title is "OpenMediaVault web adm...". The main header features the OpenMediaVault logo and the tagline "The open network attached storage solution".

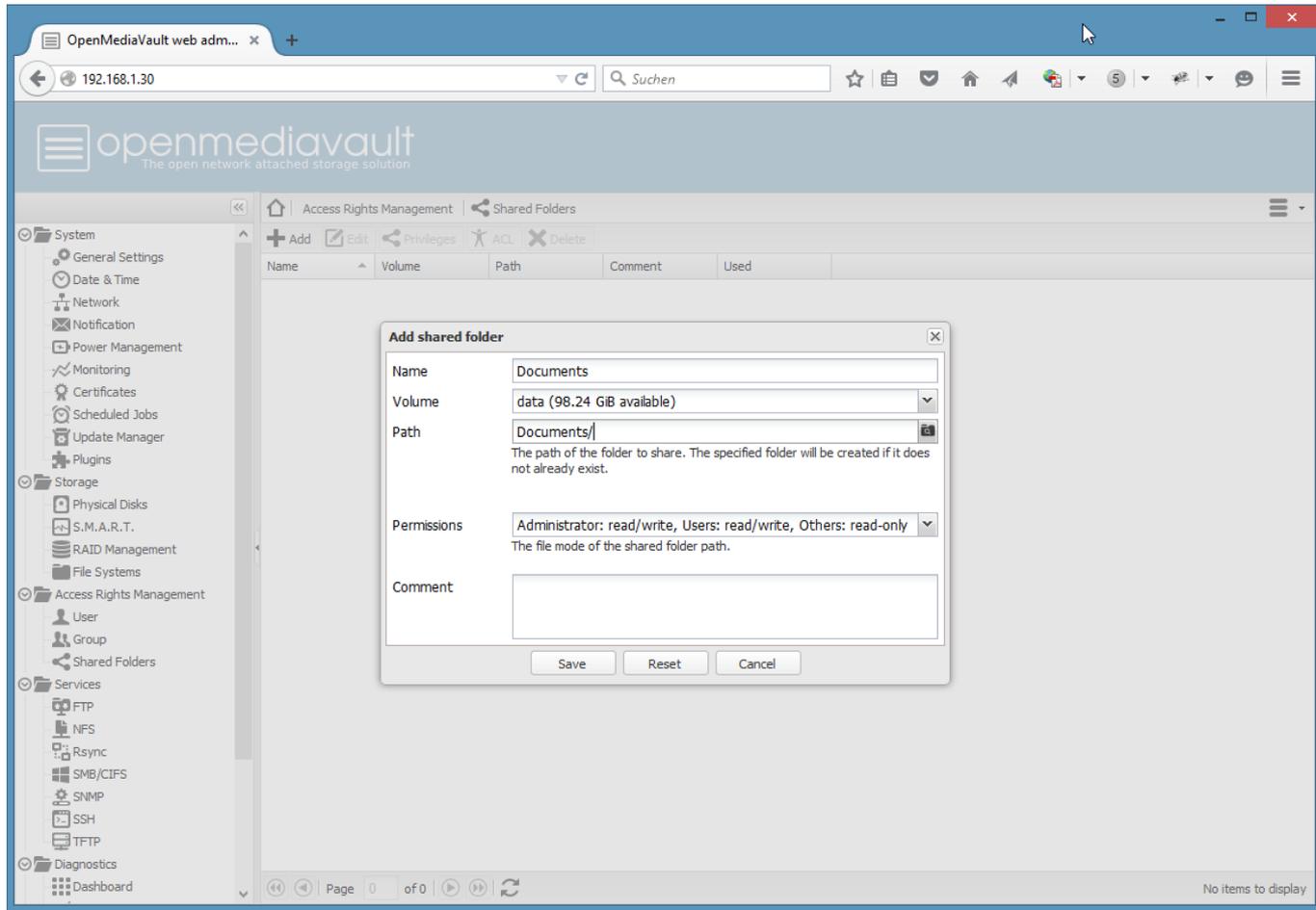
The interface is divided into a left sidebar and a main content area. The sidebar contains a navigation menu with categories like "Storage", "Access Rights Management", "Services", "Diagnostics", and "Information". The main content area is titled "Access Rights Management" and "User". It includes tabs for "Users" and "Settings", and a toolbar with "Add", "Edit", "Privileges", and "Delete" actions.

An "Add user" dialog box is open, showing the "General" tab. The fields are filled with the following information:

- Name: `till`
- Comment: (empty)
- Email: `till@example.com`
- Password: (masked with dots)
- Confirm password: (masked with dots)
- Shell: `/bin/dash`
- Modify account: Disallow the user to modify his account.

At the bottom of the dialog box, there are "Save", "Reset", and "Cancel" buttons. The main content area below the dialog box shows a table with columns for "Name", "Email", "Comment", and "Groups", and a footer indicating "No items to display".

Passo 7: Condividere directory!



The screenshot displays the OpenMediaVault web administration interface. The browser address bar shows the URL 192.168.1.30. The page title is "OpenMediaVault web adm...". The main header features the OpenMediaVault logo and the tagline "The open network attached storage solution". The navigation menu on the left includes categories like System, Storage, Access Rights Management, and Services. The main content area is titled "Access Rights Management" and "Shared Folders". A table with columns "Name", "Volume", "Path", "Comment", and "Used" is visible, but it is currently empty. A modal dialog box titled "Add shared folder" is open, allowing the user to configure a new shared folder. The dialog fields are as follows:

Field	Value
Name	Documents
Volume	data (98.24 GiB available)
Path	Documents/
Permissions	Administrator: read/write, Users: read/write, Others: read-only
Comment	

Buttons for "Save", "Reset", and "Cancel" are located at the bottom of the dialog. The status bar at the bottom of the interface shows "Page 0 of 0" and "No items to display".

Passo 8: I permessi dell'utente!

The screenshot shows the OpenMediaVault web administration interface. The browser address bar displays the URL `192.168.1.30`. The page title is "OpenMediaVault web adm...". The main content area is titled "Access Rights Management" and "Shared Folders". A table lists the shared folders:

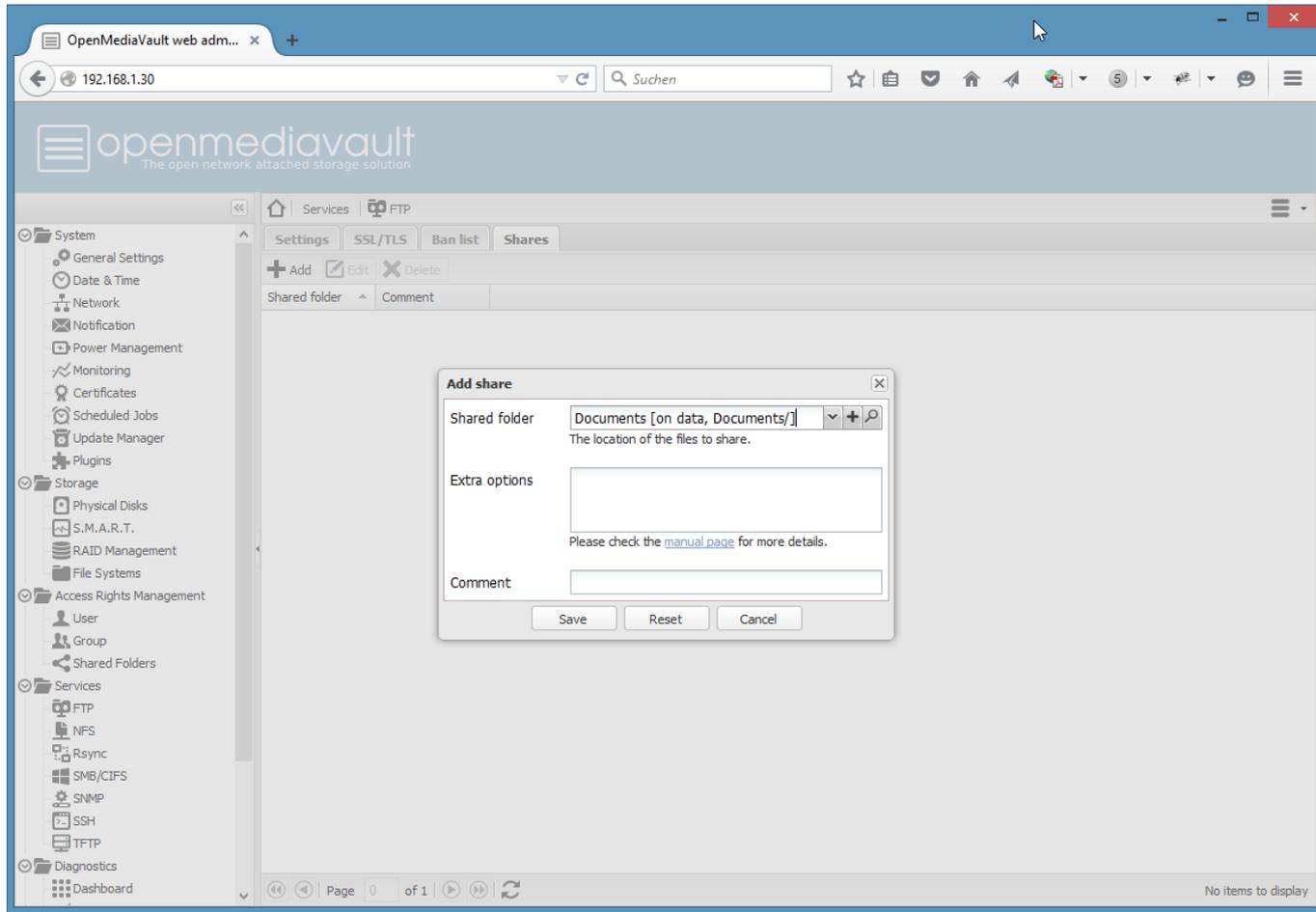
Name	Volume	Path	Comment	Used
Documents	data	Documents/		No

A modal window titled "Shared folder privileges" is open, showing the permissions for the "Documents" folder. The table lists the users and groups:

Type	Name	Read/Write	Read-only	No access
General users/groups	til	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Below the table, there is a yellow information box with the text: "These settings are used by the services to configure the user access rights. Please note that these settings have no effect on file system permissions." At the bottom of the modal, there are "Save", "Reset", and "Cancel" buttons.

Passo 9: I servizi sulla directory!

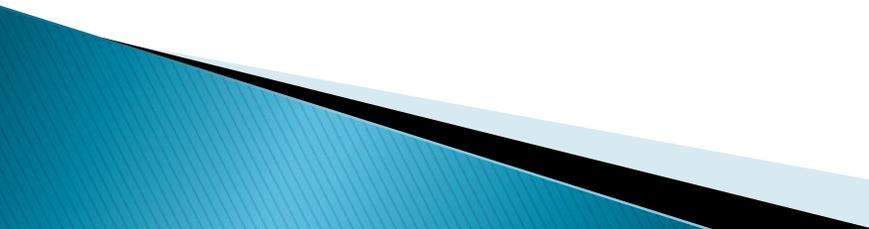


The screenshot displays the OpenMediaVault web administration interface in a browser window. The address bar shows the URL `192.168.1.30`. The page title is "OpenMediaVault web adm...". The main content area is titled "Services" and "FTP". A modal dialog box titled "Add share" is open, showing the following fields:

- Shared folder:** A dropdown menu with the selected value "Documents [on data, Documents/]" and a search icon.
- Extra options:** A text input field.
- Comment:** A text input field.

At the bottom of the dialog box, there are three buttons: "Save", "Reset", and "Cancel". The background interface shows a sidebar with various system settings and services, and a footer with "Page 0 of 1" and "No items to display".

Qualche piccolo tweak...

- ▶ Visitando questo [link](#) è possibile trovare alcune indicazioni su come ottimizzare le prestazioni del vostro Odroid XU4 con OpenMediaVault (dovrebbero essere compatibili anche con l'Odroid HC1).
 - ▶ Ottimizzazione del governor della CPU;
 - ▶ Ottimizzazione delle opzioni di mount delle partizioni NTFS;
 - ▶ Vari test e benchmark effettuati.
- 

E adesso... Condividete!

Grazie per l'attenzione!