

Lucid Hub

Connection Guide



This document provides information about the Lucid Scientific Hub for IT support.

Overview

The Lucid Hub is an embedded data storage and processing computer for the control of up to 8 [Resipher](#) cell analyzers over usb. It is intended to be used on or near a laboratory incubator.

FAQs

Why does the Hub require WAN/Internet access?

- Currently, there isn't software capable of running locally to process and analyze the data. The internet connection also enables researchers to monitor their experiment data remotely.

How do I connect the Hub?

- Via ethernet to a DHCP-enabled network.

What OS does the hub run?

- Ubuntu 24.04 LTS

Is this a network-level Hub or switch?

- No, it is a USB Hub and embedded computer - not a network-level Hub.

Does the Hub require inbound firewall forwarding?

- No, all WAN connections are outbound connections initiated by the Hub.

What domains does the Hub connect to?

- *.lucidsci.com; *.amazonaws.com; pool.ntp.org; 0.pool.ntp.org; 1.pool.ntp.org; *.ubuntu.com

Can you provide the specific subdomains?

- Yes, please contact us for an up-to-date list of the specific subdomains.

What outbound ports are the connections made with?

- TCP - 443 (https)
- UDP - 123 (ntp)

Where is the data stored?

- Data is stored both locally on the Hub's hard drive and on AWS S3.

Is the cloud data transmitted and stored securely?

- All data is sent to and retrieved from AWS using TLS/SSL. The data is stored encrypted at rest using AWS S3.

Does the Hub support WiFi?

- Most do, but a wired connection is preferred.

Is there a default password?

- No, each Hub has a unique factory generated password.

Can I install network monitoring software agents on the Hub?

- Yes, we support the installation of linux-supported network monitoring agents such as CrowdStrike Falcon or Cortex XDR.

Is there support for advanced network configuration options such as assigning a static IP address?

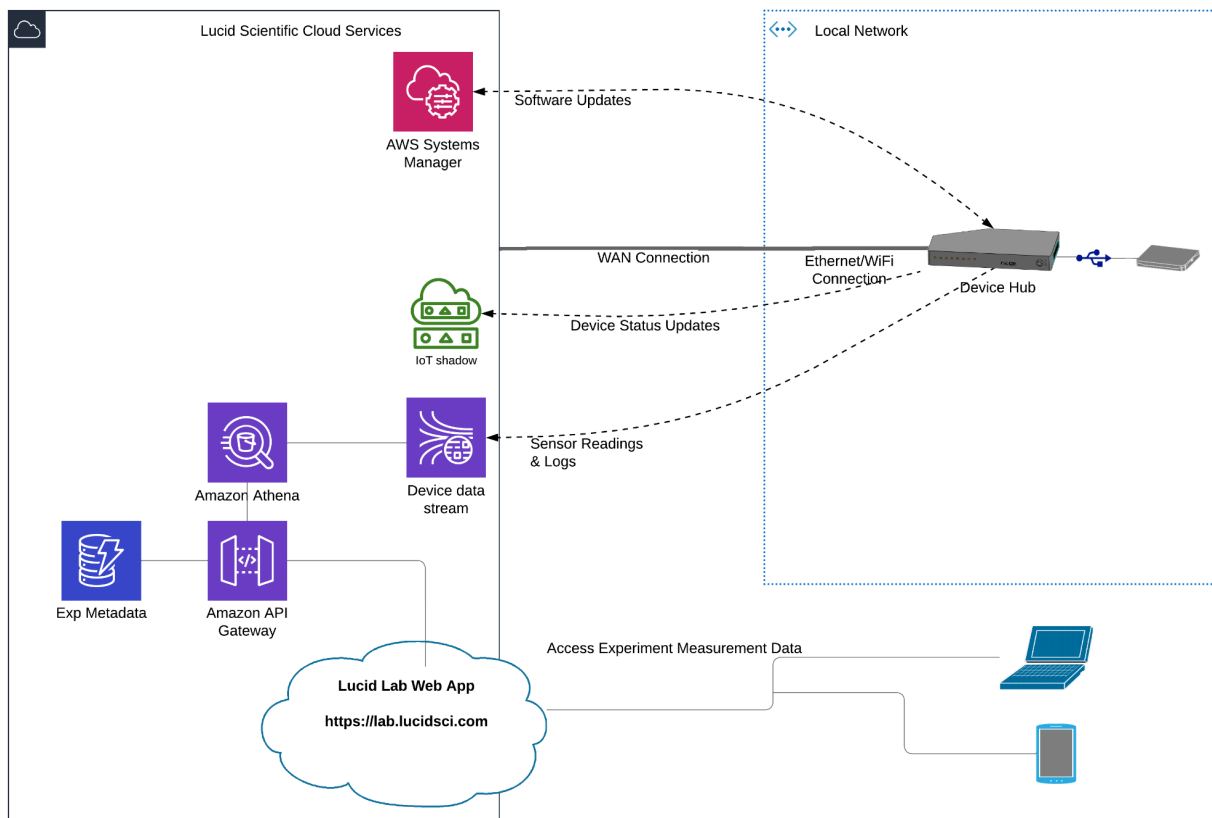
- Yes, by connecting a keyboard and an HDMI monitor to the Hub and pressing ctrl+alt+F2 you can access the network connection editor. This UI supports advanced configurations such as manual IPv4 configurations.

Are there special power requirements?

- The hub power supply works with standard outlets. If a power loss occurs, the hub should automatically reboot but in some instances it may become unresponsive after an intermittent power loss and require a power cycle.

Can you provide a basic architecture diagram?

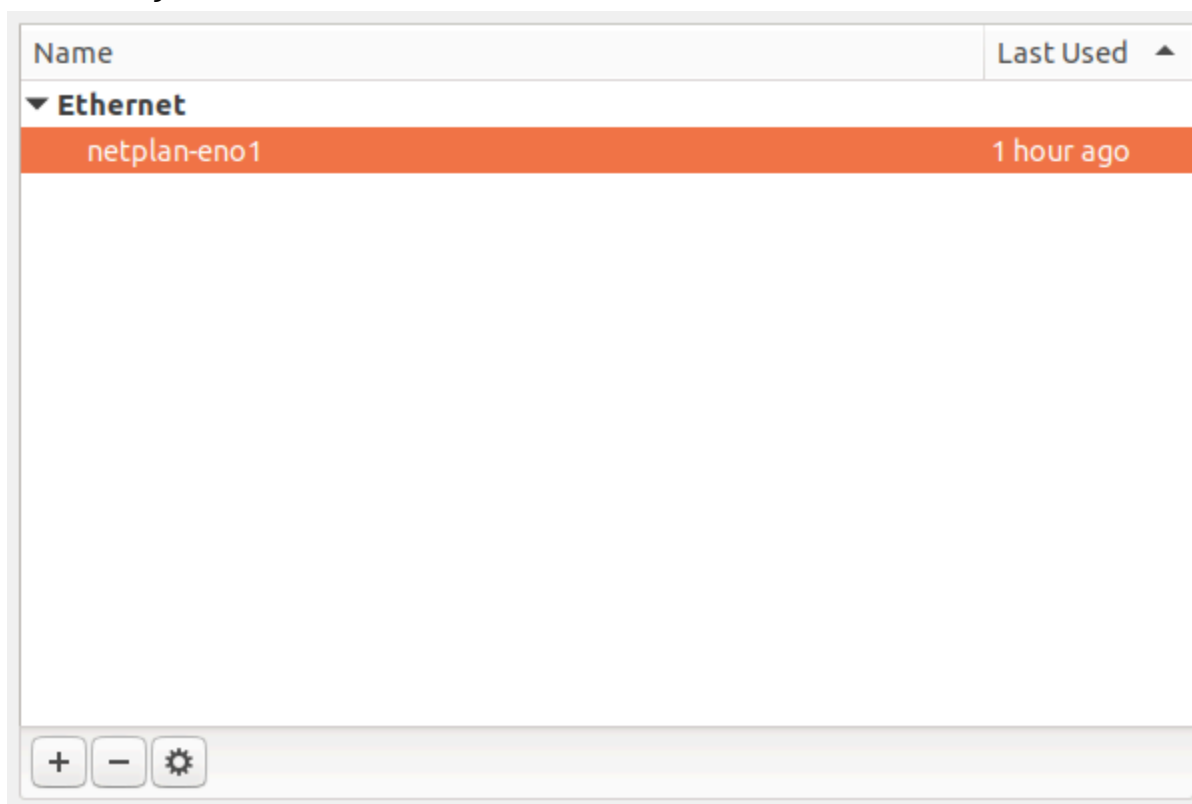
Yes, see figure below.



Configuring a Static/Manual IP Address

Typically, after connecting the Hub to a wired ethernet outlet, the Hub will automatically connect and the cloud indicator light (top right LED) will turn green. In some cases, though, the network may not support automatic connections using DHCP (the default configuration the Hub expects). In this case, the IP connection details must be entered manually. To do this, we must use the network configuration UI panel. To access the network UI panel, first connect an HDMI monitor, a usb keyboard, and a usb mouse. Then do the following:

- 1) Press Alt+Ctl+F2 to switch to the network panel screen. You should see a screen similar to the following:



- 2) Next click the plus/add button in the lower left corner to add the new manual connection. You should then see the following screen:



Choose a Connection Type

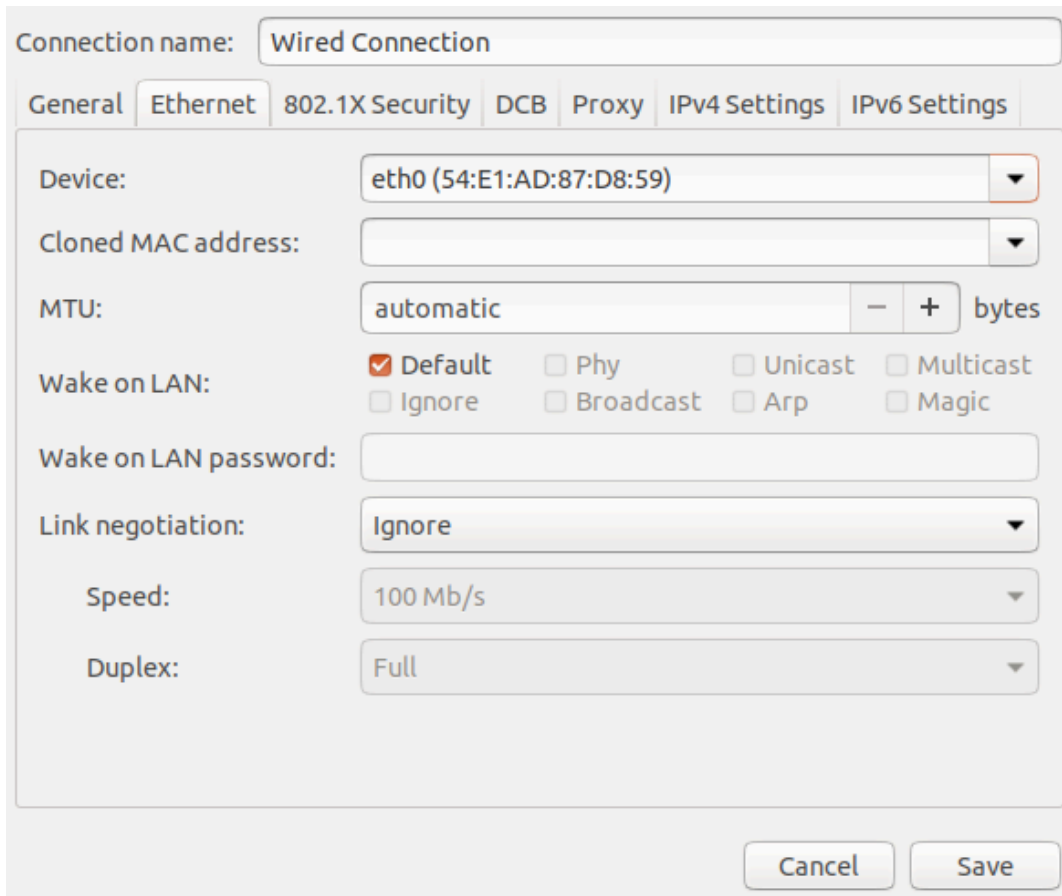
Select the type of connection you wish to create.

If you are creating a VPN, and the VPN connection you wish to create does not appear in the list, you may not have the correct VPN plugin installed.

Ethernet ▼

Cancel Create...

- 3) Click Create. You should then see the following screen for entering the connection details.



Connection name: Wired Connection

General Ethernet 802.1X Security DCB Proxy IPv4 Settings IPv6 Settings

Device: eth0 (54:E1:AD:87:D8:59) ▼

Cloned MAC address: ▼

MTU: automatic - + bytes

Wake on LAN: ☒ Default ☐ Phy ☐ Unicast ☐ Multicast
☐ Ignore ☐ Broadcast ☐ Arp ☐ Magic

Wake on LAN password:

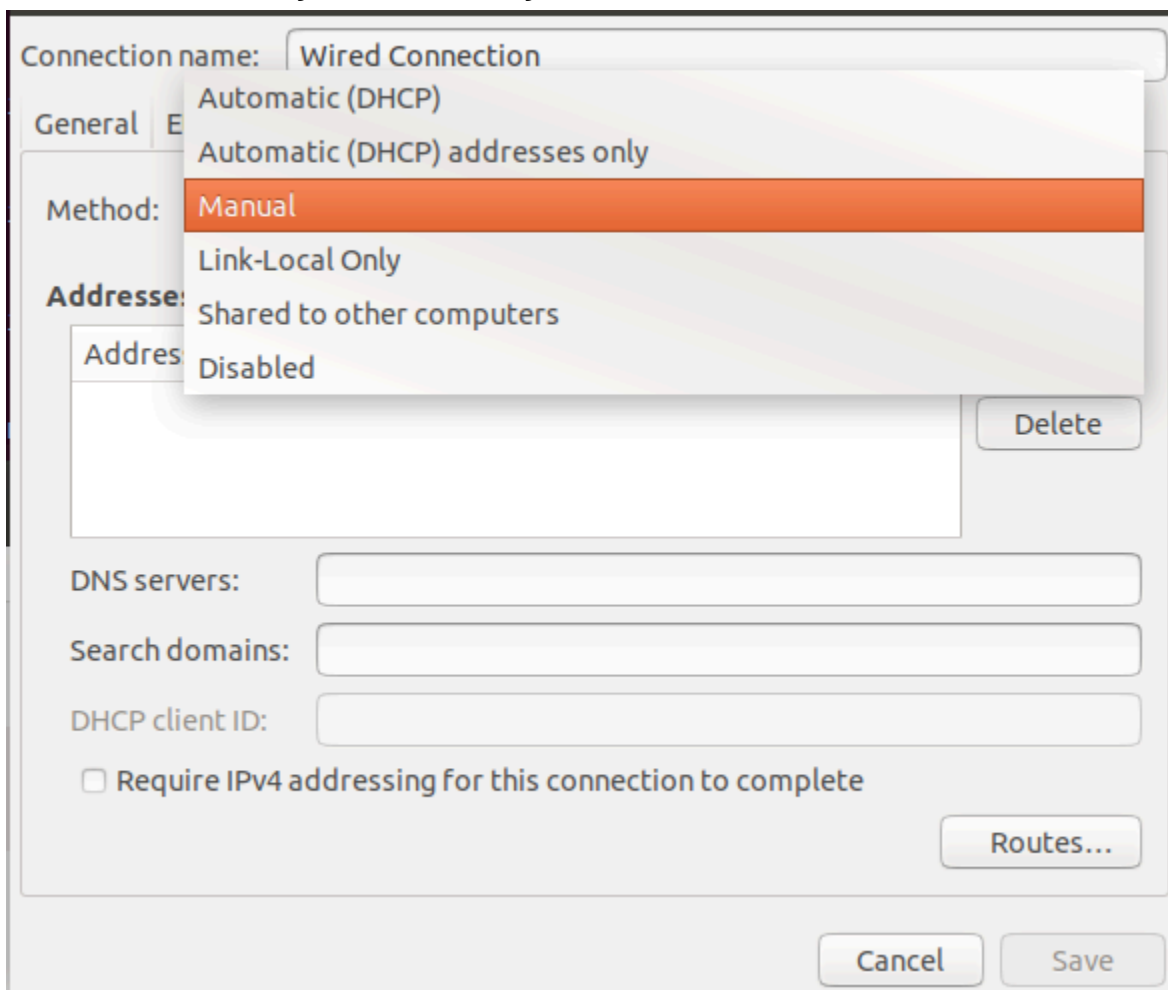
Link negotiation: Ignore ▼

Speed: 100 Mb/s ▼

Duplex: Full ▼

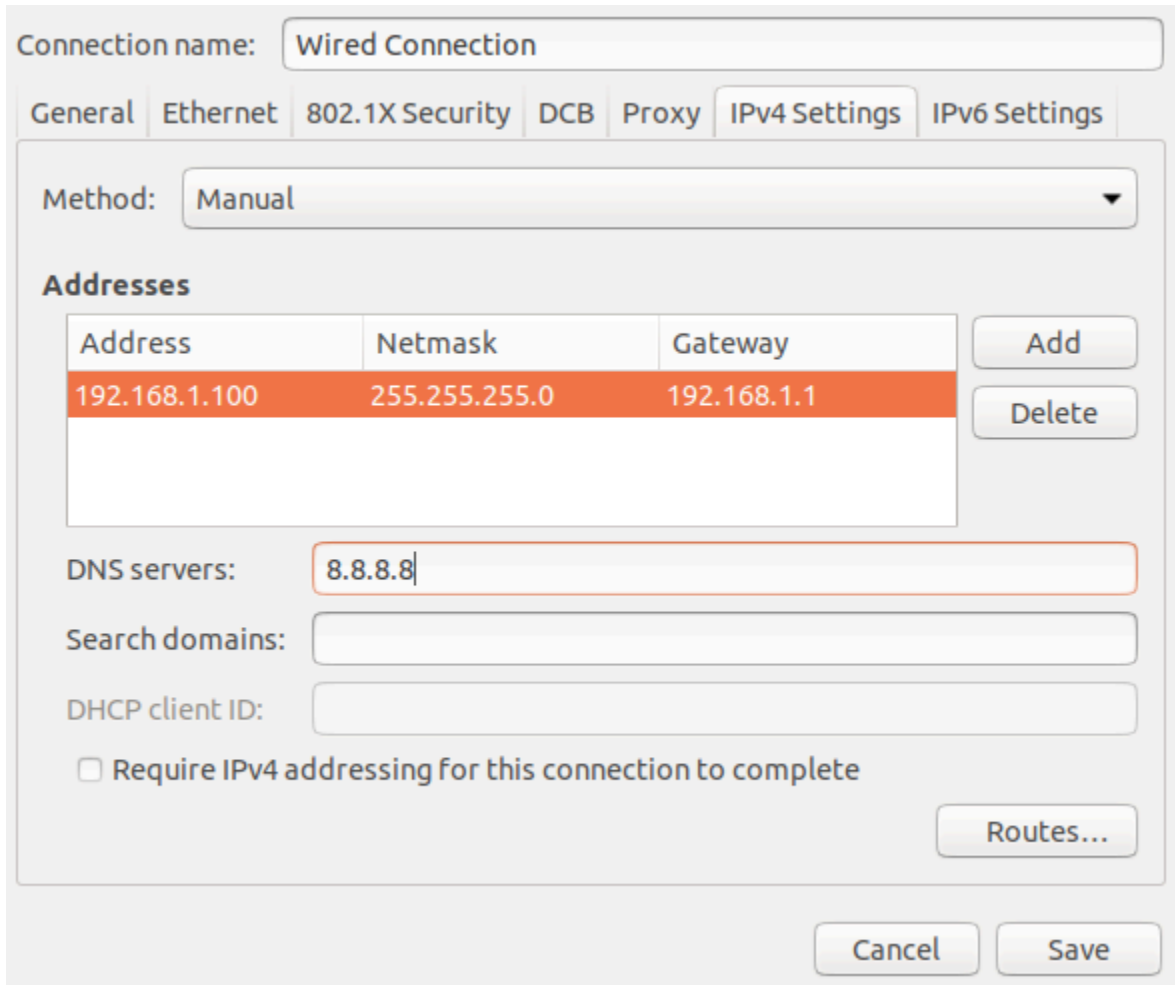
Cancel Save

- 4) Click on the IPv4 Settings tab. Then change the “Method” field to “Manual”.



The screenshot shows the 'IPv4 Settings' dialog box. The 'Connection name' is 'Wired Connection'. The 'General' tab is selected. The 'Method' dropdown menu is open, showing options: 'Automatic (DHCP)', 'Automatic (DHCP) addresses only', 'Manual' (highlighted in orange), 'Link-Local Only', 'Shared to other computers', and 'Disabled'. Below the dropdown, there is a 'Delete' button. Further down, there are input fields for 'DNS servers:', 'Search domains:', and 'DHCP client ID:'. A checkbox labeled 'Require IPv4 addressing for this connection to complete' is present. At the bottom right, there are 'Cancel' and 'Save' buttons, and a 'Routes...' button.

- 5) Next click the add button to add the Static IP information. Enter the specific IP address, Netmask, and Gateway provided by your IT organization for your connection (**DO NOT USE THE EXAMPLE VALUES SHOWN**). If not provided a DNS server, you can use Google's DNS of 8.8.8.8.



Connection name: Wired Connection

General Ethernet 802.1X Security DCB Proxy IPv4 Settings IPv6 Settings

Method: Manual

Addresses

Address	Netmask	Gateway
192.168.1.100	255.255.255.0	192.168.1.1

DNS servers: 8.8.8.8

Search domains:

DHCP client ID:

☐ Require IPv4 addressing for this connection to complete

Routes...

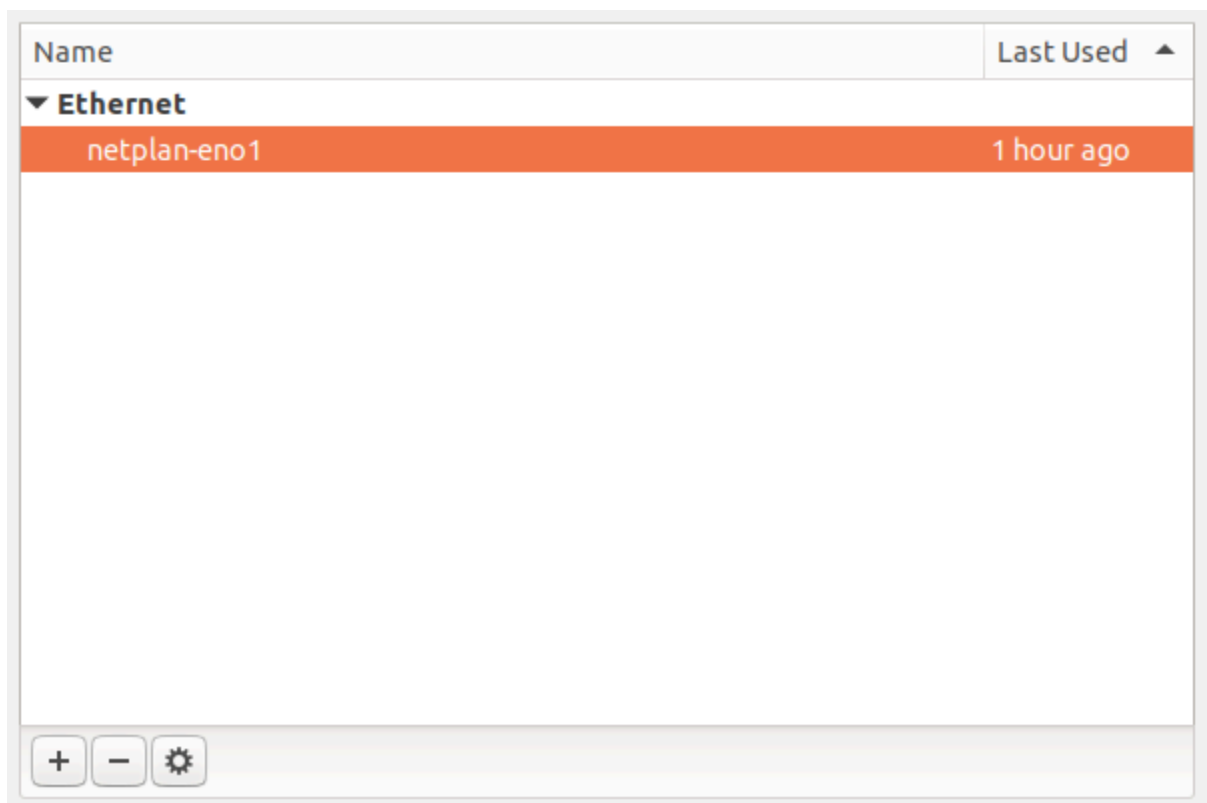
Cancel Save

- 6) Click Save to return to the main network connections list. Select and delete the top (original/default) connection so that the new connection is applied. The "Last Used" field should update to "Now" indicating the network connection is now in use.

WiFi Configuration

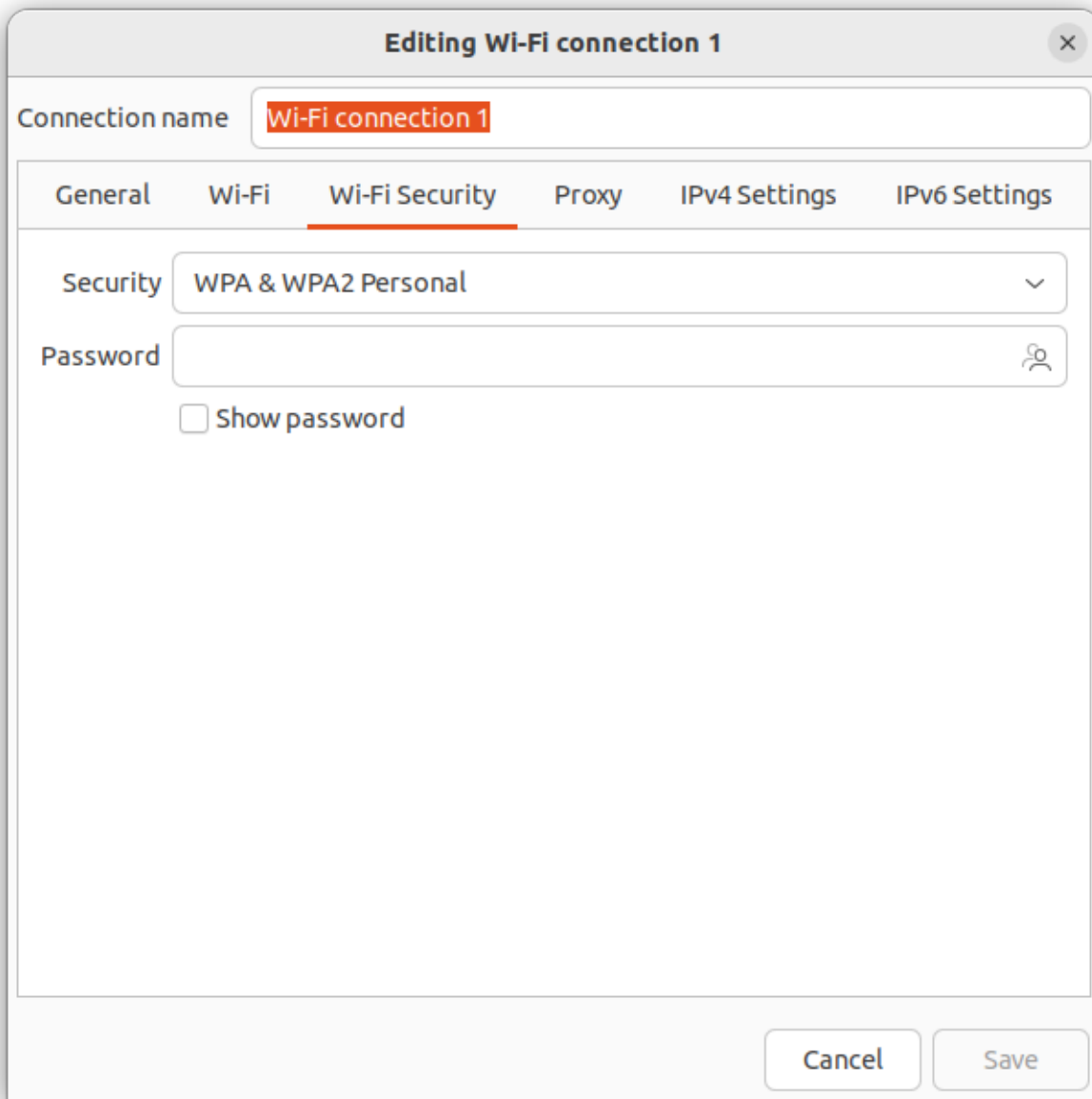
Some Hubs are equipped with WiFi support. To add a wifi connection, do the following:

- 1) Connect an HDMI monitor, a usb keyboard, and a usb mouse
- 2) Press Alt+Ctrl+F2 to switch to the network panel screen. You should see a screen similar to the following:



- 3) Click the plus/add button to add a new connection.
- 4) Select Wi-Fi as the connection type.
- 5) In the SSID field, type the name of the wifi network.
- 6) Under the Wi-Fi security tab, select the network security type (most likely WPA & WPA2 Personal). For eduroam networks, this is likely WPA2 Enterprise.

- 7) The password field will appear. Enter the wifi network password. Then click Save. If successful, the "Last Used" column for the connection will show "Now".



Editing Wi-Fi connection 1

Connection name: **Wi-Fi connection 1**

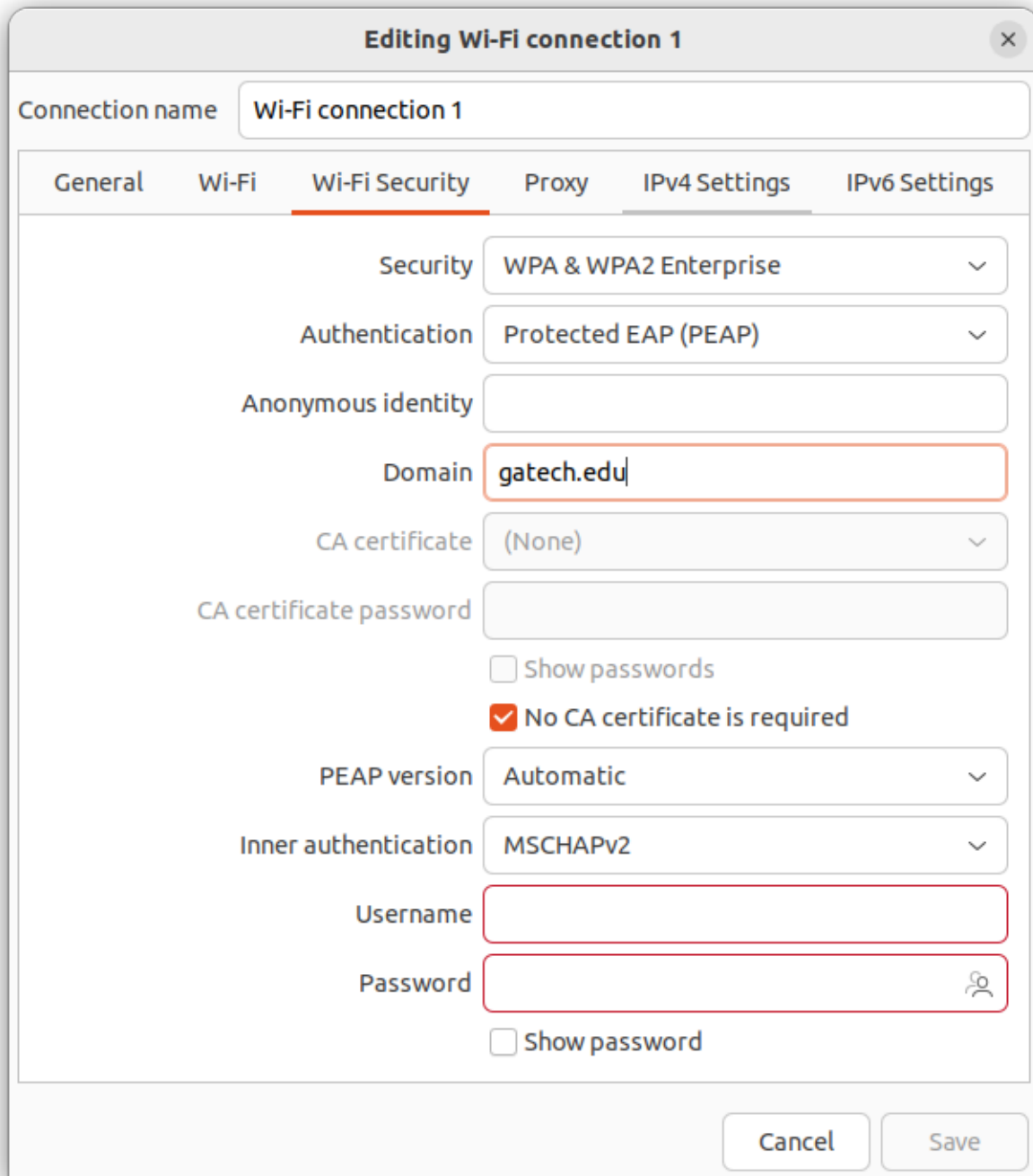
General Wi-Fi **Wi-Fi Security** Proxy IPv4 Settings IPv6 Settings

Security: WPA & WPA2 Personal

Password:

☐ Show password

Cancel Save



Editing Wi-Fi connection 1

Connection name: Wi-Fi connection 1

General Wi-Fi **Wi-Fi Security** Proxy IPv4 Settings IPv6 Settings

Security: WPA & WPA2 Enterprise

Authentication: Protected EAP (PEAP)

Anonymous identity:

Domain: gatech.edu

CA certificate: (None)

CA certificate password:

☐ Show passwords

☒ No CA certificate is required

PEAP version: Automatic

Inner authentication: MSCHAPv2

Username:

Password:

☐ Show password

Cancel Save

WPA2 Enterprise settings for “eduroam” networks. Enter “Domain”, “Username”, and “Password” fields provided by your campus IT.

Open Source

The Hub contains unmodified free/open-source licensed software. To request more information (such as obtaining access to this software), please contact us at info@lucidsci.com.

Data Restrictions

This system is for research use only. While it is designed and implemented to securely store and access data, users are instructed not to enter sensitive information such as PII/PHI. The Hub and web app are not certified for HIPAA or GLP/GMP. The system is intended for research purposes only and not intended for clinical or diagnostic use.

For other Resipher related information, please visit our website: <https://lucidsci.com/>

Other user guides can be found - <https://lucidsci.com/resources#documentation>

For support, please contact support@lucidsci.com

