

IOTA 10G

USER MANUAL

Top Client			Server IP		
Data	Average bps	Max bps	Data	Average bps	Max bps
2.98 GB	107.53 kbps	2.42 Mbps	172.28.190.238	2.01 GB	413.78 kbps
489.02 MB	243.02 kbps	2.31 Mbps	10.0.0.10	974.08 MB	101.46 kbps
11.38 MB	113.95 kbps	529.08 kbps	192.168.1.1	506.54 MB	121.78 kbps
3.57 MB	12.60 kbps	670.73 kbps	192.168.1.230	615.83 kB	71.40 kbps
1.27 MB	49.24 kbps	57.07 kbps	10.13.41.195	51.51 kB	17.41 kbps
1.25 MB	49.64 kbps	57.08 kbps	192.168.1.255	340.32 bps	1.46 kbps
18.72 kB	222.50 bps	288.00 bps		84 kbps	7.18 kbps
18.36 kB	216.50 bps	288.00 bps			176.00 bps
4.05 kB	658.67 bps	1.03 Mbps			
3.57 kB	988.00 bps	1.23 Mbps			



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TABLE OF CONTENTS

1. Product Overview **1**

1.1 Hardware Overview	1
1.2 Specifications	2
1.3 Interfaces & LED Behavior	3

2. Getting Started **5**

2.1 Deploying the IOTA	5
2.2 Powering the device	7
2.3 Access IOTA over network	7
2.4 IOTA Configuration	9
System Time	9
System Network	10
Access / Internal Firewall	10
ZeroTier	11
System Control	11
System Updates	12

3. Capture Guide **13**

3.1 Capture Control	13
3.2 Interface Configuration	15
Port Control	15
SFP	15
Capture Features	16
Firmware	17
Filters	17

3.3 Autonomous Capture	18
3.4 Data Vault	19
Captured Files	19
Import a PCAP-NG	19
3.5 Data Management	20
Disk Usage	20
Schedule a Cleanup	20
Manual Disk cleanup	21

4. Analysis Guide **22**

4.1 Dashboard overview	22
4.2 Basic Navigation	23
Main dashboard selection menu	23
Time range selection	24
Filtering traffic	25
Graphs	26
4.3 PCAP file download	27

5. Legal **29**

PRODUCT OVERVIEW

1.1 HARDWARE OVERVIEW

IOTA is a multifunctional passive network probe with integrated traffic capture and analysis capabilities. Designed as a secure and flexible analysis solution, IOTA is a great asset to get access and visibility into industrial or enterprise level networks.

Profitap IOTA is used by network engineers and IT analysts to get a fast and clear overview of the network traffic. This means a comprehensive analysis can be performed quickly, helping engineers get to the root cause in a matter of clicks.

The device can be deployed as a dedicated probe, or programmed for autonomous analysis, eliminating the need of an on-site network expert.

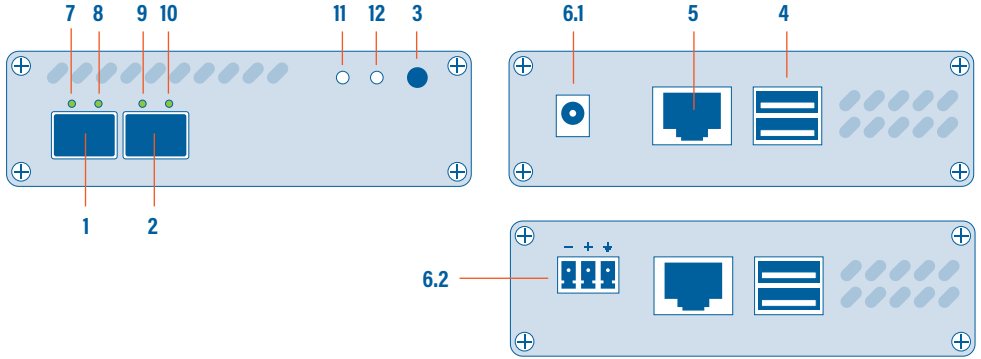


1.2 SPECIFICATIONS

IN-LINE MODE		Yes
IN-LINE LATENCY		500 ns
IN-LINE JITTER		20 ns
DUAL SPAN INPUTS MODE		Yes
FAIL-SAFE		No
CAPTURE PERFORMANCE		3.2 Gbps / 5 Mpps
PACKET PROCESSOR		Yes, 20 Gbps / 32 Mpps
HARDWARE TIMESTAMPING		1G: 8 ns, NTP synchronized 10G: 6.4 ns, NTP synchronized
INTERNAL STORAGE		1 TB
POWER INPUTS	12V MODEL	12 VDC
		PoE (management RJ45)
	24V MODEL	24–48 VDC
		PoE (management RJ45)
POWER CONSUMPTION		15 W
MANAGEMENT	Interfaces	10/100/1000 Ethernet
		2 x USB 3.0
	Services	HTTPS (server), UPnP/VPN

1.3 INTERFACES & LED BEHAVIOR


IOTA 10G Interface



- 1, 2 SFP/SFP+ port A and port B, accepting both optical and copper connections.
- 3 START/STOP/RESET button
- 4 2 x USB 3.0 port type A
- 5 RJ45 Management port (PoE)
- 6.1 12 VDC power input
- 6.2 24-48 VDC power input
- 7, 8, 9, 10, 11, 12 Activity LEDs

IOTA 10G LED Behavior

LEDs	ORANGE	GREEN STEADY	GREEN SLOW BLINK	GREEN FAST BLINK	RED
<p>7 + 8 or 9 + 10</p>	NO SFP MODULE PRESENT OR DETECTED	—	NO LINK	—	CONNECT ADDITIONAL POWER
<p>8 or 10</p>	—	SPAN MODE, LINK UP	—	SPAN MODE, TRAFFIC ACTIVITY	—
<p>7 + 8 + 9 + 10</p>	NO SFP MODULE PRESENT OR DETECTED	IN-LINE MODE, LINK UP	NO LINK	IN-LINE MODE, TRAFFIC ACTIVITY	CONNECT ADDITIONAL POWER

<i>LEDs</i>	<i>LED 11 STATE</i>	<i>LED 12 STATE</i>	<i>MEANING</i>
11 12 	Orange Blink	OFF	Booting
	Green	Green	Running
	Green	Green Blink	Capturing
	Green	Orange Blink	Capturing warning
	Green	Red	Disk Full
	Orange Green Blink	Orange Green Blink	Updating
	Red Blink	Red Blink	Hardware Failure
	Orange Blink	Orange Blink	Factory Reset
	Green Blink	OFF	Shutting down
	OFF	OFF	Shutdown completed

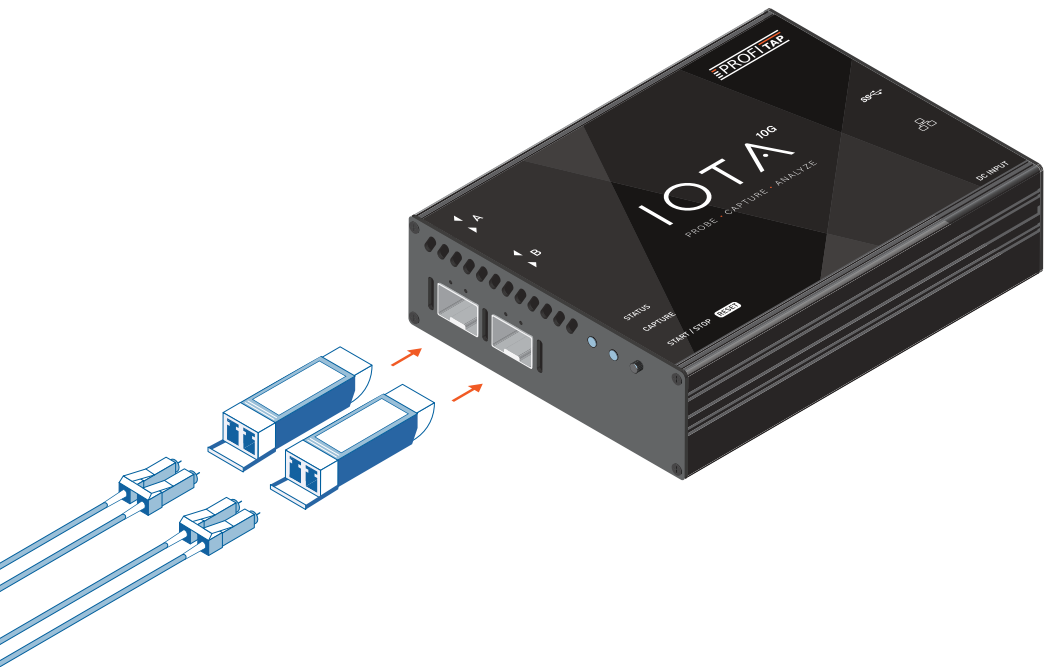
GETTING STARTED

2.1 DEPLOYING THE IOTA

IOTA 10G

Insert the cables of the line to be monitored in the SFP modules. In the case of LC optical fiber cables, make sure to match the Tx-Rx / Tx-Rx signal direction at the other end.

- ▶ **Note:** Due to the nature of SFP modules requiring power for operation, IOTA 10G doesn't include a bypass feature for failsafe monitoring. An external TAP can be employed in order to implement failsafe monitoring.



IOTA 10G RACKMOUNT MODEL

The rackmount model can be mounted in a standard 19" rack, using the Profitap Rackmount Chassis Kit (sold separately; reference: ARKB-1U). Secure the chassis to the rack using the provided screws, then insert the IOTA and secure it to the chassis using the thumbscrews on the front panel of the device.



2.2 POWERING THE DEVICE

Connect the 12V/2.5A DC power supply, or the 24–48VDC terminal block, depending on the IOTA model. Alternatively, the device can be powered via PoE, over the management port. Connect both power port and PoE management port for redundant powering, ensuring continued operation in case either port were to be disconnected or unable to provide power.

IOTA boots automatically after a power connection is established. Its status can be observed via the activity LEDs.

- ▶ **Note:** Initial boot may take some time to complete. When both the Status and Capture LEDs are green, IOTA has completed the boot sequence.

Once powered, the in-line failover circuit is disabled, effectively placing the device in-line.

2.3 ACCESS IOTA OVER NETWORK

To access the IOTA over the network, connect to the HTTPS interface by browsing to the device IP of your IOTA, including port number.

The full URL should be: `https://x.x.x.x:3000`

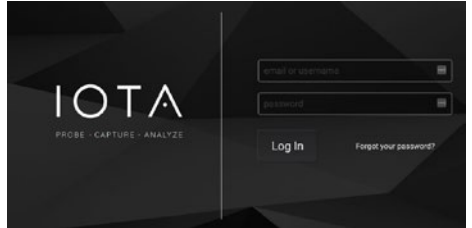
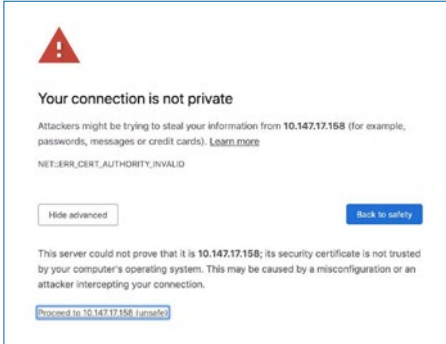
DHCP mode is enabled by default. If no IP is assigned to the IOTA, the default fallback IP is **169.254.1.1**.

For the initial login, use the following credentials:

Default username: **admin**

Default password: **admin**

- ▶ **Note:** In case your browser displays a 'Your connection is not private' warning, click on **advanced > proceed to...** URL at the bottom to proceed to the IOTA login page.



2.4 IOTA CONFIGURATION

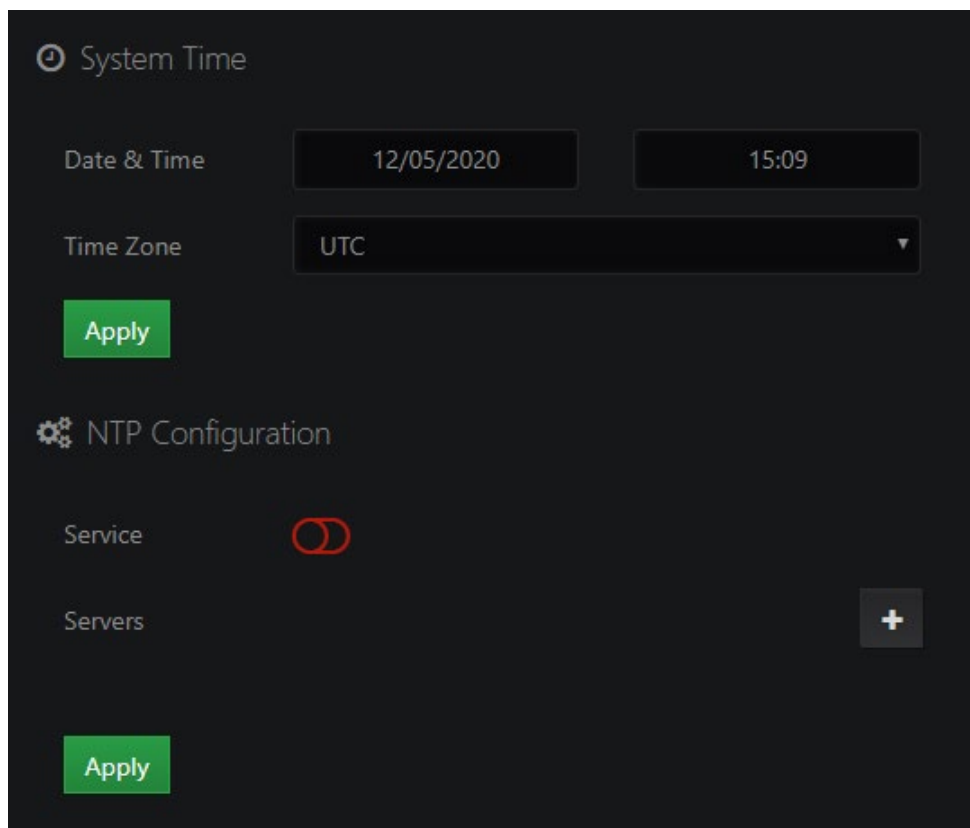
System Time

NTP service is enabled by default: if Internet access is provided to IOTA, no extra configuration is required. System time can also be adjusted manually.

The system time is used by:

- the embedded OS,
- the capture interface to constantly discipline the hardware timestamp counter.

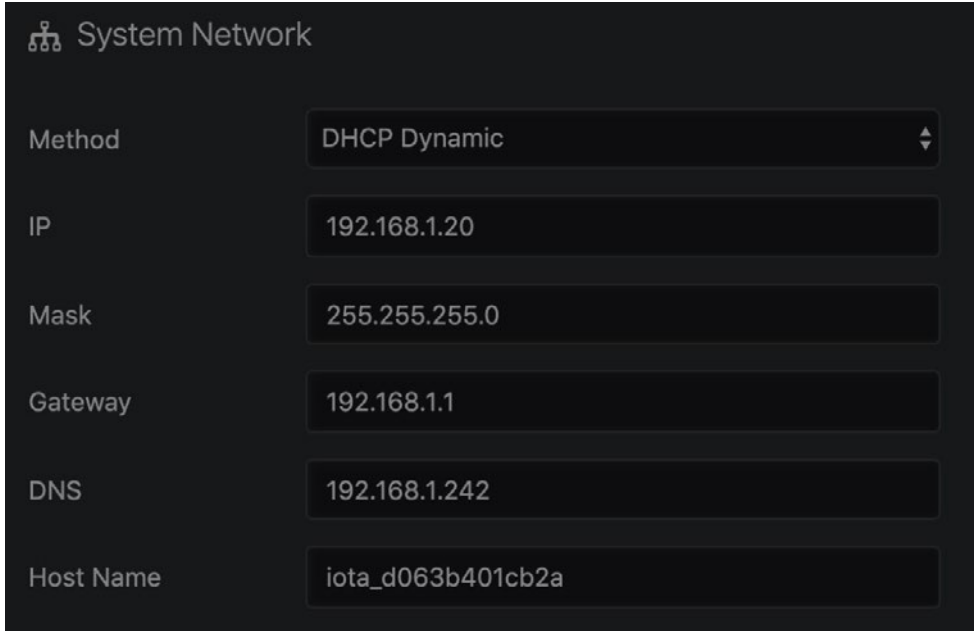
Changing time may require a restart of the capture interface to take effect.



The screenshot displays a dark-themed configuration window. At the top, the title 'System Time' is accompanied by a clock icon. Below this, the 'Date & Time' section features two input fields: the first contains '12/05/2020' and the second contains '15:09'. Underneath, the 'Time Zone' is set to 'UTC' in a dropdown menu. A green 'Apply' button is positioned below these settings. The lower section, titled 'NTP Configuration' with a gear icon, shows the 'Service' status as 'off', indicated by a red toggle switch. Below the service status, the 'Servers' section includes a plus sign icon in a grey box. A second green 'Apply' button is located at the bottom left of the configuration area.

System Network

Navigate to IOTA Settings / Configuration to change default network settings like IP, Mask, Gateway, DNS and Host Name.

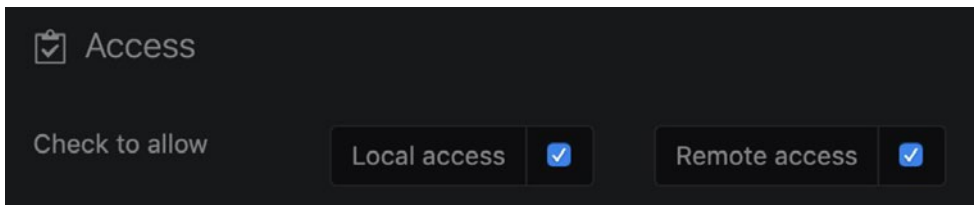


The screenshot shows a dark-themed configuration window titled "System Network" with a network icon. It contains six input fields for network settings:

Field	Value
Method	DHCP Dynamic
IP	192.168.1.20
Mask	255.255.255.0
Gateway	192.168.1.1
DNS	192.168.1.242
Host Name	iota_d063b401cb2a

Access / Internal Firewall

Used to limit access from local clients (LAN subnetwork) and/or remote clients (WAN, ZeroTier).



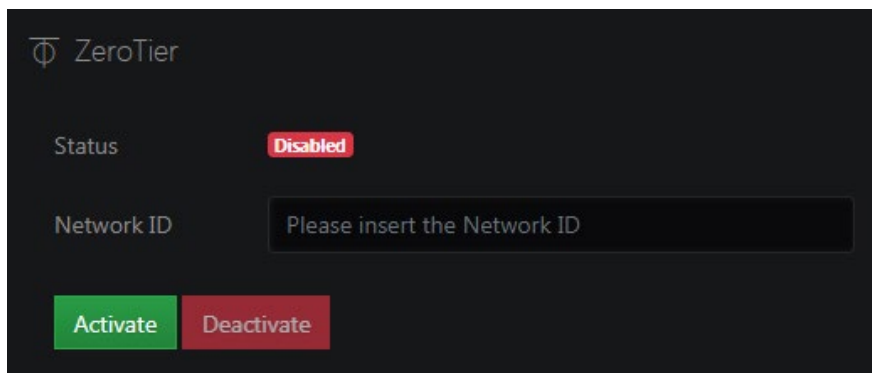
The screenshot shows a dark-themed configuration window titled "Access" with a checkmark icon. It contains two toggle switches under the heading "Check to allow":

Option	Checked
Local access	<input checked="" type="checkbox"/>
Remote access	<input checked="" type="checkbox"/>

ZeroTier

ZeroTier provides an easy way to remotely access the device via a P2P VPN and manage virtual networks on a cloud application.

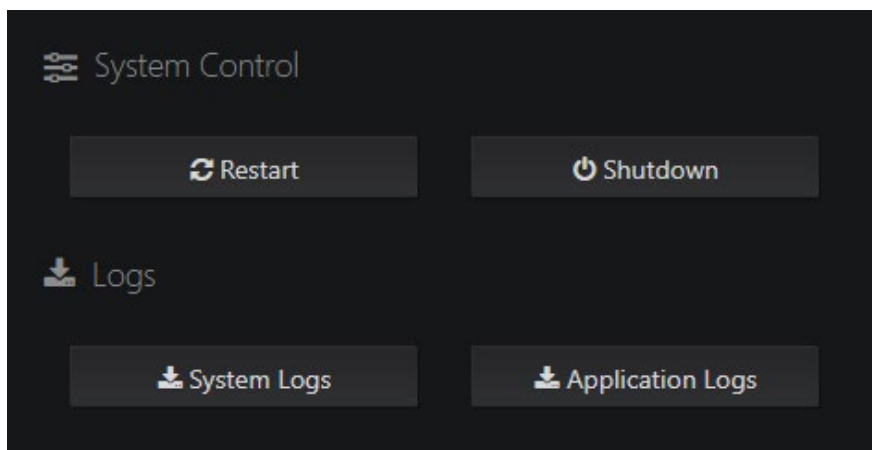
(more information: www.zerotier.com)



System Control & Logs

Remotely restart or turn off your IOTA by pressing the 'Restart' or 'Shutdown' button.

Download system logs and application logs by pressing the 'System Logs' or 'Application Logs' button.



System Updates

The ***IOTA Settings > System Updates*** page provides information about the current IOTA software version, latest available version, and changelog. If the IOTA can access the internet, the latest version number and changelog are fetched automatically, and the IOTA software can be updated via the 'Update' button. If the device cannot access the internet, the latest IOTA software can be downloaded from ***<https://iota.profitap.com/>*** and updated via the 'Select a file' button.

CAPTURE GUIDE

3.1 CAPTURE CONTROL

The interface in **Capture > Capture Control** contains options for the capture of traffic and indexing of captured traffic.

When a capture is in progress, the traffic is automatically indexed in the specified datasource. If the 'Keep Files' option is enabled in the capture interface's settings, the captured traffic is saved on the disk, with new files being automatically created either every 30 seconds, or when the current file's size reaches 4 GB.

- ▶ **Note:** Capture files are automatically analyzed and indexed. The 'keep file' option determines whether or not the trace files are conserved in the data vault after having been analyzed.
If the 'keep file' option is enabled, it will be possible to retrieve the complete trace file, part or it, or a filtered copy, from the dashboards.
If the 'keep file' option is disabled, the dashboards will only display the indexed data, and it will not be possible to retrieve the original trace file.

The *Indexing* section defines the database and the index in which the captured data will be indexed.

The default datasource is the database already present on the IOTA device. Other datasources can be selected if they have been set up in **Configuration > Data Sources**.

The *Index* subsection defines which index the captured data will be saved to. Either select an index already present on the selected database, or create a new one by selecting the second option and typing a name (must start with 'profisight').

Edit ProfShark ✕

Nickname

Interface Name

Device Model

Device MAC

Keep Files

Packet Analyzer Settings

DNS Resolution

Indexing

Select a valid Datasource

Index Select a index

profisight-23.6.2020

Session Keyword

Files will be available only after the first 30 seconds of capture.

3.2 INTERFACE CONFIGURATION

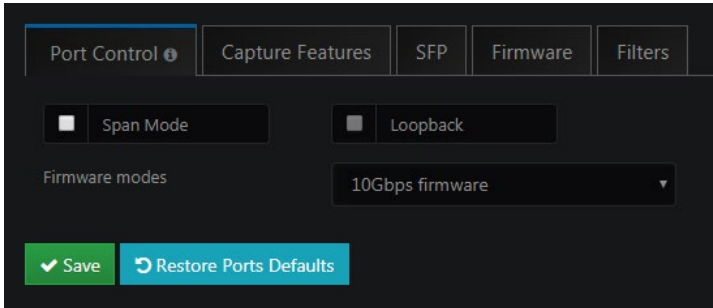
The **Capture > Interface Configuration** screen gives an overview of connected devices, Capture Statistics and Device information. To change interface settings, several tabs are available:

Port Control

If IOTA is intended to be used in-line, the appropriate configuration must be set. 'In-Line mode' is the default mode ('Span Mode' checkbox unticked). IOTA can be set to SPAN Mode by ticking the 'Span Mode' checkbox.

Loopback mode can be enabled when SPAN mode is enabled, by ticking the 'Loopback' checkbox.

The firmware can be set to either 1Gbps or 10Gbps mode via the 'Firmware modes' drop-down menu.



SFP

This tab provides SFP information for both port A and B.

The screenshot shows the SFP configuration interface with two tabs: "Hardware Status" and "Information".

Hardware Status

Ports Properties	Low Alarm		Low Warning		High Warning		High Alarm		Value	
	A	B	A	B	A	B	A	B	A	B
Temperature (°C)	31.0	0.0	8.0	0.0	7.0	0.0	78.0	0.0	38.4	0.0
VCC (V)	2.90	0.00	3.00	0.00	3.00	0.00	3.70	0.00	3.33	0.00
TX Bias (mA)	4.000	0.000	5.000	0.000	12.000	0.000	13.200	0.000	1.290	0.000
TX Power (mW)	0.251	0.000	0.316	0.000	0.794	0.000	1.000	0.000	0.508	0.000
RX Power (mW)	0.010	0.000	0.016	0.000	0.754	0.000	1.000	0.000	0.238	0.000

Other Information

	A	B
Warnings	-	-
Alarms	-	-
Status Bits	-	-

Information

Ports Properties	A	B
Link	Up	Up
Vendor Name	FINISAR CORP.	SAHOC
Vendor OUI	0x009065	0x202020
Model	FTLX8571D38CL	SIB512-XSATO
Revision	A	
Date code	04-21-2015	11-12-2008 00
Serial number	MTEOPRL	A081115279
Bitrate, nominal	103	12

Capture Features

The screenshot shows the "Capture Features" configuration tab with the following settings:

- Keep CRC32
- Transmit CRC Errors
- Disable Port A
- Packet Slicing (bytes)
- Disable Port B

A "Save" button is visible at the bottom left.

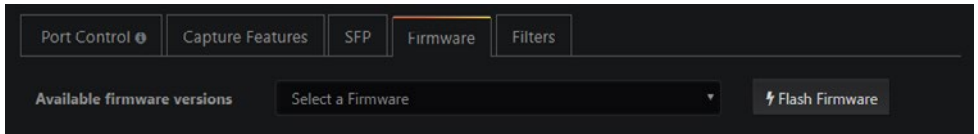
This tab allows the configuration of the following capture settings:

- Transmit CRC Errors
- Keep CRC32
- Packet Slicing (in bytes)
- Disable Port A
- Disable Port B

Features can be enabled and disabled by ticking or unticking the related checkbox.

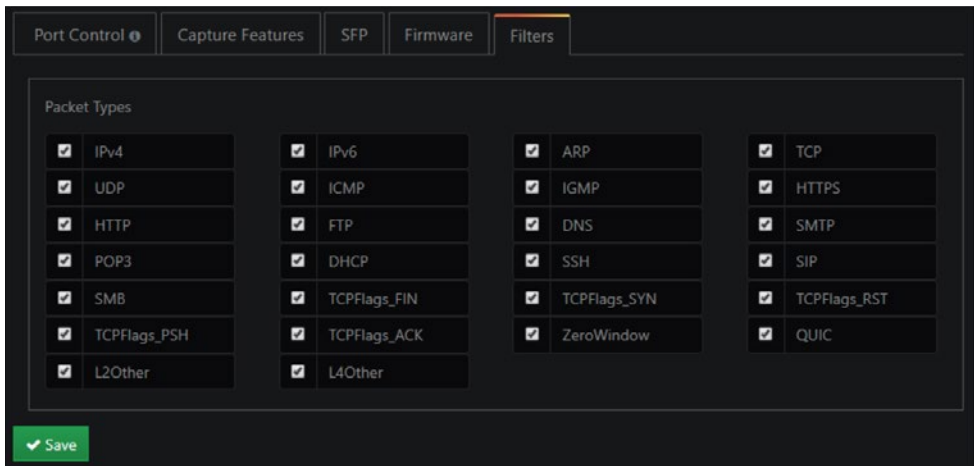
Firmware

The firmware can be flashed by selecting a firmware version from the drop-down menu and clicking the 'Flash Firmware' button.



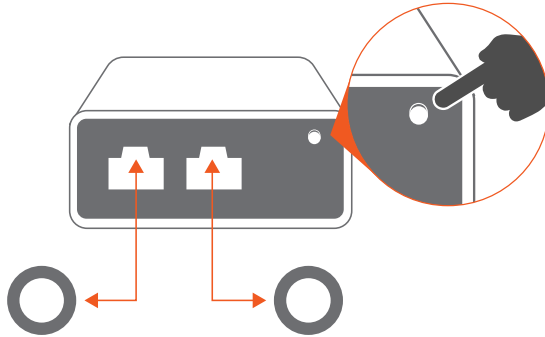
Filters

The hardware filters in the Filters tab allow you to include or exclude packets based on their type. Selected packet types will be included in the capture, and unselected packet types will be excluded.



3.3 AUTONOMOUS CAPTURE

To be able to capture traffic in networks where remote access over the network is not allowed or not possible, you can start IOTA's autonomous capture feature by pressing the physical START/STOP button.



START: Starts capture. IOTA will use latest settings in Capture Control

STOP: Stop Capture

FACTORY RESET: Disconnect power from IOTA. Long-press the START/STOP button and while holding, reconnect power and hold for 20 seconds. FACTORY RESET is complete when LEDs are green.

RESET: Long-press the START/STOP button and hold for 20 seconds. RESET is complete when LEDs are green. This will reset password and network parameters.

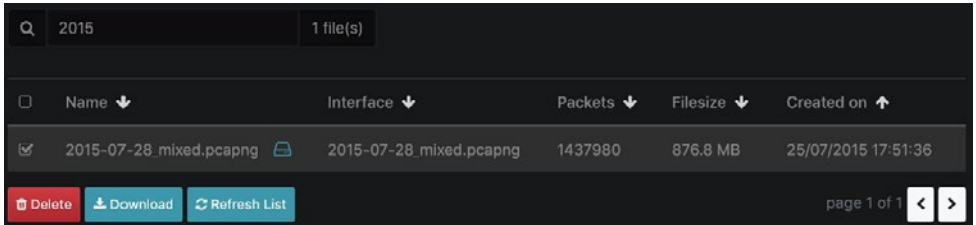
SHUTDOWN: Press and hold for 10 seconds for safe device shutdown. This will stop capture and unmount the internal disk in order to end capture session.

- ▶ **Note:** Make sure the appropriate settings have been applied in 'Interface Configuration' before deploying the IOTA in the network you want to analyze.

3.4 DATA VAULT

Captured Files

Navigate to **Data Vault > Captured Files** to download or delete raw PCAP-NG files. Select one or more files and click the 'Download' button to download a .zip archive of the selected files, or the 'Delete' button to delete them.

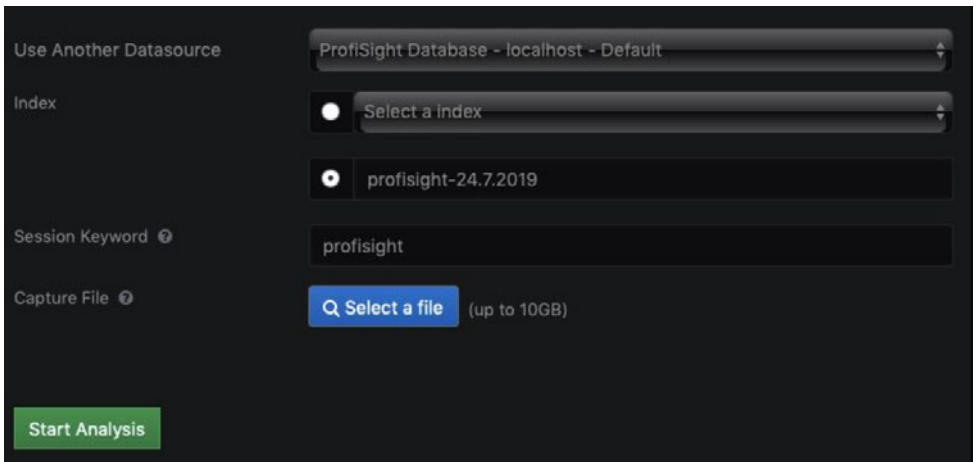


<input type="checkbox"/>	Name ↓	Interface ↓	Packets ↓	Filesize ↓	Created on ↑
<input checked="" type="checkbox"/>	2015-07-28_mixed.pcapng	2015-07-28_mixed.pcapng	1437980	876.8 MB	25/07/2015 17:51:36

page 1 of 1

Import a PCAP-NG

Importing a PCAP-NG or PCAP file to the IOTA can be done by clicking the 'Select a file' button, selecting the file, and clicking the 'Start Analysis' button. Once uploaded, set the time range of the dashboards to that of the file to ensure the graphs display the correct data.



Use Another Datasource: Profisight Database - localhost - Default

Index: Select a index

Session Keyword: profisight

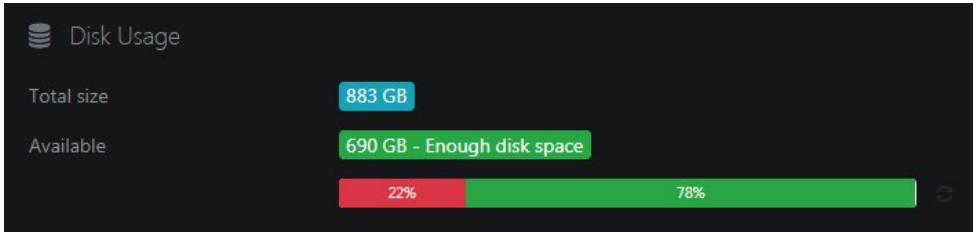
Capture File: Select a file (up to 10GB)

Start Analysis

3.5 DATA MANAGEMENT

Disk Usage

Navigate to **Data Management > Capture Machine** to get an overview of the disk usage, including total disk size and available disk space.

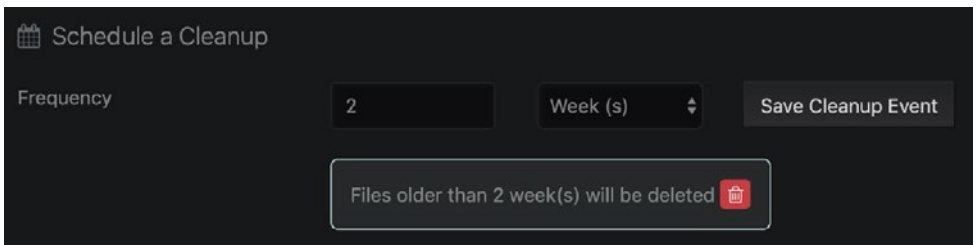


A good practice is to check every once in a while the amount of free storage left and make an assessment on whether a cleanup is in order or not, as there are limitations for capturing and indexing related to the available space:

- New captures can only start if at least 5% of disk space is available.
- Database indexing can only start if at least 10% of disk space is available. If already running, indexing will stop if less than 10% of disk space remains available.

Schedule a Cleanup

Data retention management is available at **Data Management > Capture Machine > Schedule a Cleanup**. Capture files and index older than the specified time range will be deleted regularly.



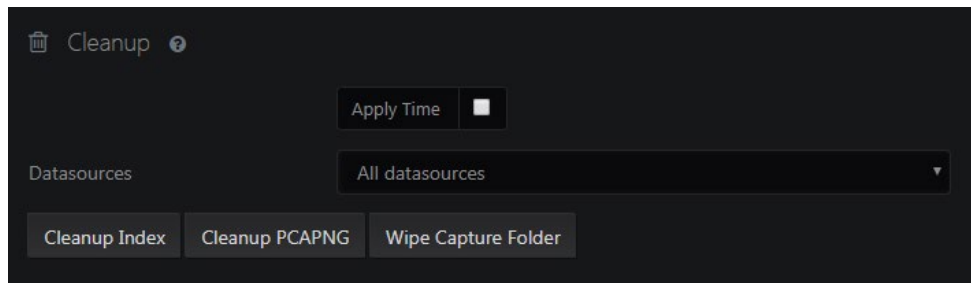
The screenshot shows the 'Schedule a Cleanup' configuration screen with the following details:

- Frequency: 2
- Unit: Week (s)
- Action: Save Cleanup Event
- Confirmation: Files older than 2 week(s) will be deleted

Manual Disk Cleanup

Manual cleanup of capture files and index is possible with the following options:

- Selective cleanup based on time
- Selective cleanup based on index
- Cleanup index or PCAP files or both



ANALYSIS GUIDE

4.1 DASHBOARD OVERVIEW



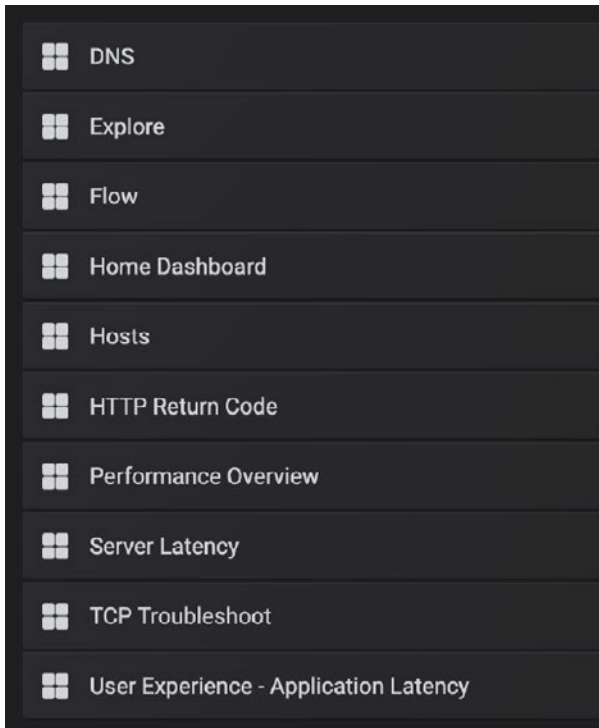
1. Main menu
2. Logout
3. Main dashboard selection
4. Time range selection
5. Dashboard area
6. Display filter
7. PCAP file download
8. Dashboard navigation with filters and time selection
9. Dashboard configuration

4.2 BASIC NAVIGATION

Main dashboard selection menu

This menu displays all the available dashboards. The list of dashboards is non-exhaustive and will change over time to include new features and other improvements.

- ▶ **Note:** Accessing a dashboard from this menu resets the Time pickers time range and the Display filter defined in the current dashboard. To navigate through dashboards while keeping the time range and filters set, use the '**Goto >>**' dashboard navigation.



Time range selection


Time range and automatic refresh rate can be set from this menu.


The screenshot shows a dark-themed interface for selecting time ranges. At the top, there is a toolbar with icons for chart, star, share, save, settings, and a monitor. A dropdown menu is open, showing 'Last 24 hours' selected. Below the toolbar, the menu is divided into two sections: 'Quick ranges' and 'Custom range'.

Quick ranges

Last 2 days	Yesterday	Today	Last 5 minutes
Last 7 days	Day before yesterday	Today so far	Last 15 minutes
Last 30 days	This day last week	This week	Last 30 minutes
Last 90 days	Previous week	This week so far	Last 1 hour
Last 6 months	Previous month	This month	Last 3 hours
Last 1 year	Previous year	This month so far	Last 6 hours
Last 2 years		This year	Last 12 hours
Last 5 years		This year so far	<u>Last 24 hours</u>

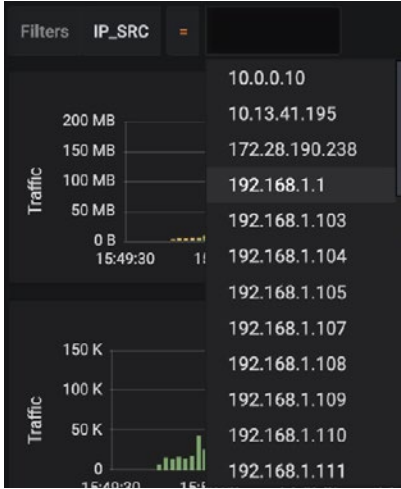
Custom range

From: 

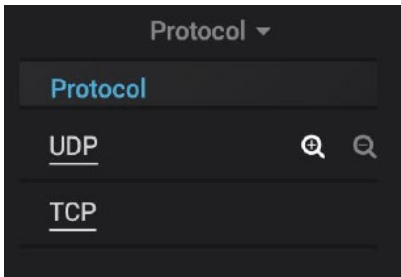
To: 

Filtering traffic

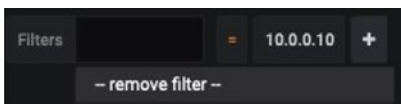
Display filters can be defined manually by clicking the + icon next to the Filter box (top left) and selecting the filter type and value it needs to filter on.



Alternatively, in the dashboards, filters can be applied quickly by using the + magnifier icon (include filter), or the - magnifier icon (exclude filter)

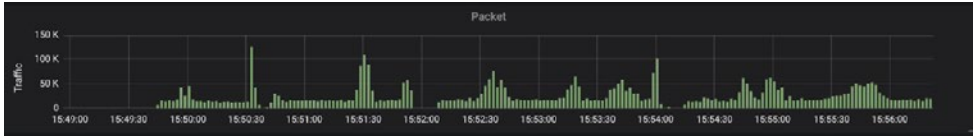


Filters can be removed by clicking the filter type again and selecting '--remove filter--'

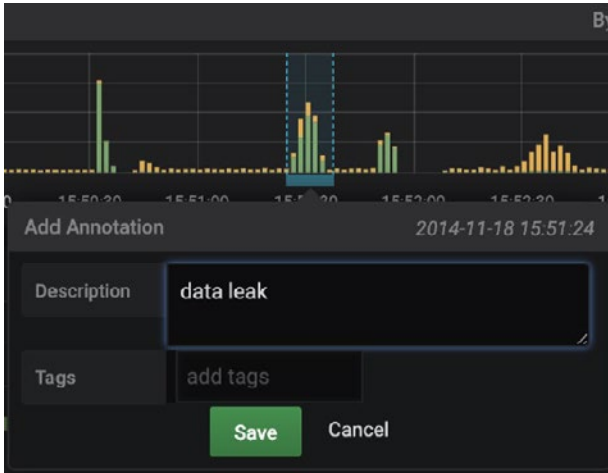


Graphs

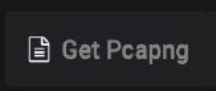
Click and drag to zoom in on a specific time range.



Use CTRL/CMD + mouse drag to add annotations to the graph.



4.3 PCAP FILE DOWNLOAD

A dark grey rectangular button with a white document icon and the text 'Get Pcapng' in white.

Use the 'Get Pcapng' button at the top right corner of any dashboard to download the PCAPNG file.

The time range of the downloaded PCAP file corresponds with the time range selected in the Time picker menu.

The following filters will also apply to the downloaded PCAPNG files:

- ◉ IP address
- ◉ MAC address
- ◉ VLAN ID
- ◉ Protocol
- ◉ Port



If a MAC address, IP address, or port is selected, the filter affects both source and destination.

Additional methods to download PCAP files:

1 - Use the direct download link

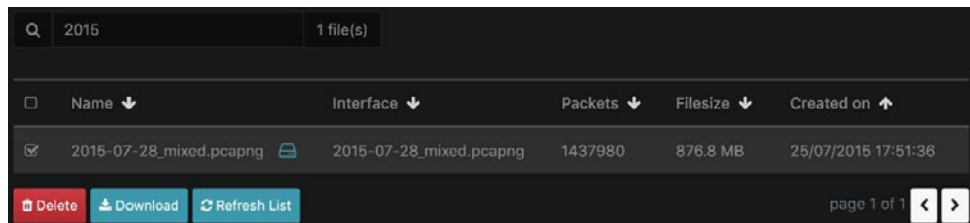
Clicking on any link starts the PCAP file transfer, filtered with value only. Filters are ignored with this method.

Top Client ▾				
Client IP	Data ▾	Average bps	Max bps	
192.168.1.1	223.36 MB	89.62 kbps	510.06 kbps	Download PCAP
172.28.190.238	15.37 MB	361.52 kbps	2.31 Mbps	
192.168.1.241	97.55 kB	44.54 kbps	54.72 kbps	
192.168.1.242	82.67 kB	46.54 kbps	54.72 kbps	


2 - Download the raw PCAP-NG file(s) from a list

(Data Vault > Captured Files)

The file or group of files are downloaded in a .zip archive.



The screenshot shows a dark-themed interface for a file list. At the top, there is a search bar containing '2015' and a status indicator '1 file(s)'. Below this is a table with columns for selection, Name, Interface, Packets, Filesize, and Created on. A single file is listed: '2015-07-28_mixed.pcapng' with an interface of '2015-07-28_mixed.pcapng', 1437980 packets, and a filesize of 876.8 MB. At the bottom, there are three buttons: 'Delete' (red), 'Download' (blue), and 'Refresh List' (blue). The page number 'page 1 of 1' and navigation arrows are also visible.

<input type="checkbox"/>	Name ↓	Interface ↓	Packets ↓	Filesize ↓	Created on ↑
<input checked="" type="checkbox"/>	2015-07-28_mixed.pcapng 	2015-07-28_mixed.pcapng	1437980	876.8 MB	25/07/2015 17:51:36

page 1 of 1

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