IOTA 1G+

USER MANUAL

PROFITAP

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https://www.profitap.com/resource-center/

TABLE OF CONTENTS

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.

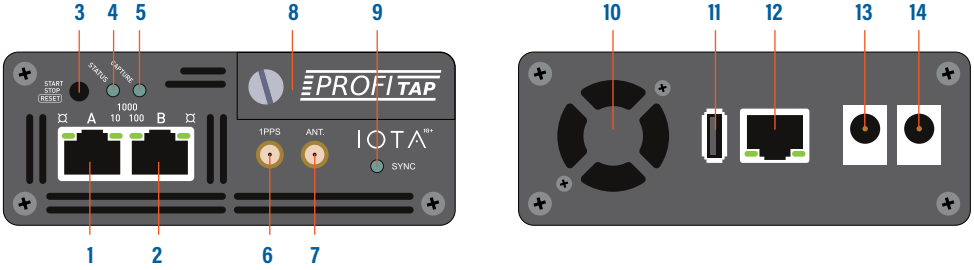
The device can be deployed as a dedicated probe, or programmed for autonomous analysis, eliminating the need of an on-site network expert.

1.2 SPECIFICATIONS

IN-LINE MODE		Yes
IN-LINE LATENCY		1G: 380 ± 8 ns 100M: 720 ± 24 ns 10M: 7600 ± 25 ns
IN-LINE JITTER		20 ns
DUAL SPAN INPUTS MODE		Yes
FAIL-SAFE		Yes
CAPTURE PERFORMANCE		3.2 Gbps / 3.2 Mpps
PACKET PROCESSOR		Yes, 2 Gbps / 3.2 Mpps
HARDWARE TIMESTAMPING		Yes: 8 ns, NTP synchronized
INTERNAL STORAGE		1 TB or 2 TB swappable SSD
POWER INPUTS	***12V MODEL***	12 VDC
		PoE (management RJ45)
	24V MODEL	24–48 VDC
		PoE (management RJ45)
POWER CONSUMPTION		TBD
MANAGEMENT	***Interfaces***	10/100/1000 Ethernet
		USB 3.0
	Services	HTTPS (server), UPnP/VPN

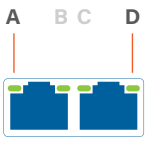
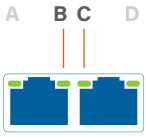
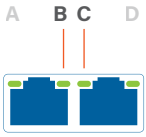
1.3 INTERFACES & LED BEHAVIOR

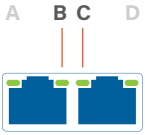
IOTA 1G+ Interface



1, 2	Ethernet port A, B	8	Removable SSD Slot
3	START/STOP/RESET Button	9	Sync. LED
4	Status LED	10	Fan
5	Capture LED	11	USB 3.0
6	PPS Connector	12	RJ45 Management Port
7	GPS/GLONASS Antenna Connector	13, 14	Power Connectors

IOTA 1G+ LED Behavior

LEDs	STATE	MEANING
	**A** and/or **D** steady green	The port is linked.
	A and/or **D** blinking green	The port is linked and has RX/TX activity (traffic is passing through).
	**B** steady green **C** off	Capture interface operating at 10 Mbps speed.
	B blinking green **C** off	Capture interface is initializing.
	**B** off **C** steady green	Capture interface operating at 100 Mbps speed.
	B off **C** blinking green	Capture interface firmware is corrupted.

LEDs	STATE	MEANING
	**B**+**C** steady green	Capture interface operating at 1 Gbps speed.
	B+**C** blinking green	The port is linked and has RX/TX activity (traffic is passing through).
	B+**C** alternating blinking	Capture interface cannot find a common speed between the connected devices.

LEDs	STATUS LED STATE	CAPTURE LED STATE	MEANING
	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

LEDs	SYNC LED STATE	MEANING
	ON	Internal timestamp synchronized with the configured time system (GPS, NTP, etc.) with an accuracy of ± 16 ns.

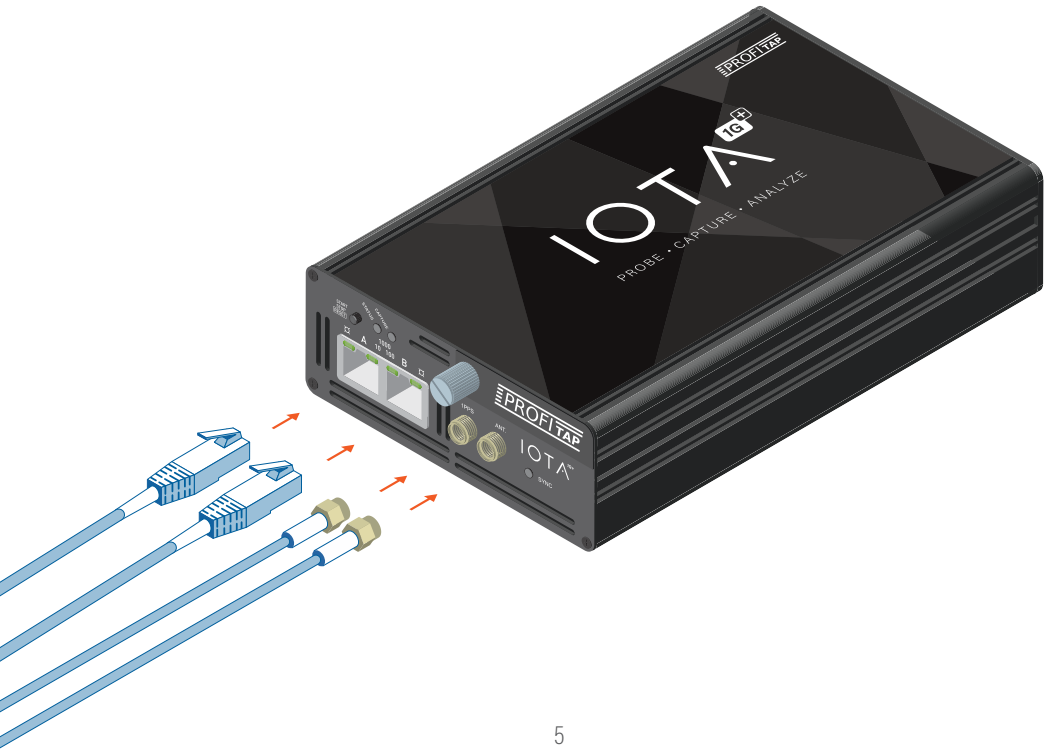
GETTING STARTED

2.1 DEPLOYING THE IOTA

IOTA 1G+

Insert Ethernet cables of the line you want to monitor into the RJ45 port A and B of the IOTA, using category 5 UTP cables, rated for Gigabit operations.

> ► **Note:** When deploying IOTA in-line, connect it to the network prior to powering it in order to make full use of its fail-safe capabilities. This step is critical to verify the availability of the in-line path in case of failover.



IOTA 1G+ 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.

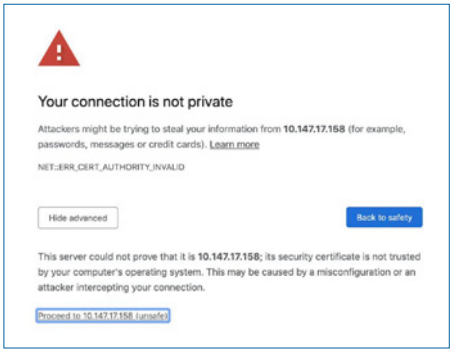
Once powered, the in-line failover circuit is disabled, effectively placing the device in-line.

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.



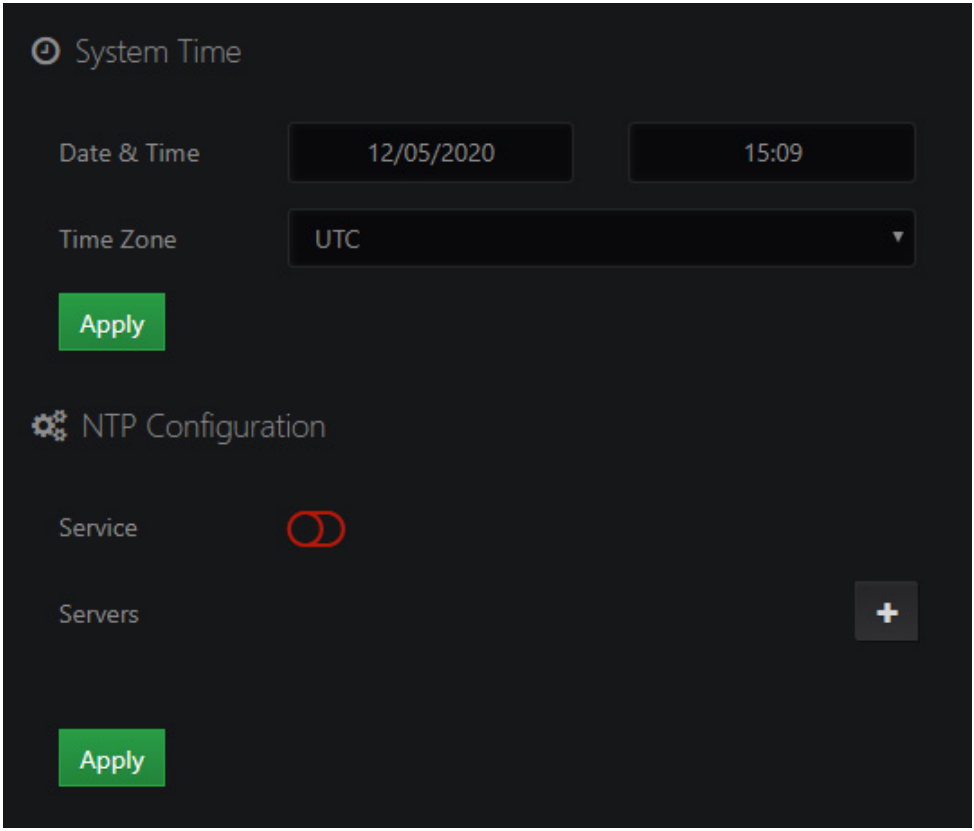
2.4 IOTA CONFIGURATION

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.

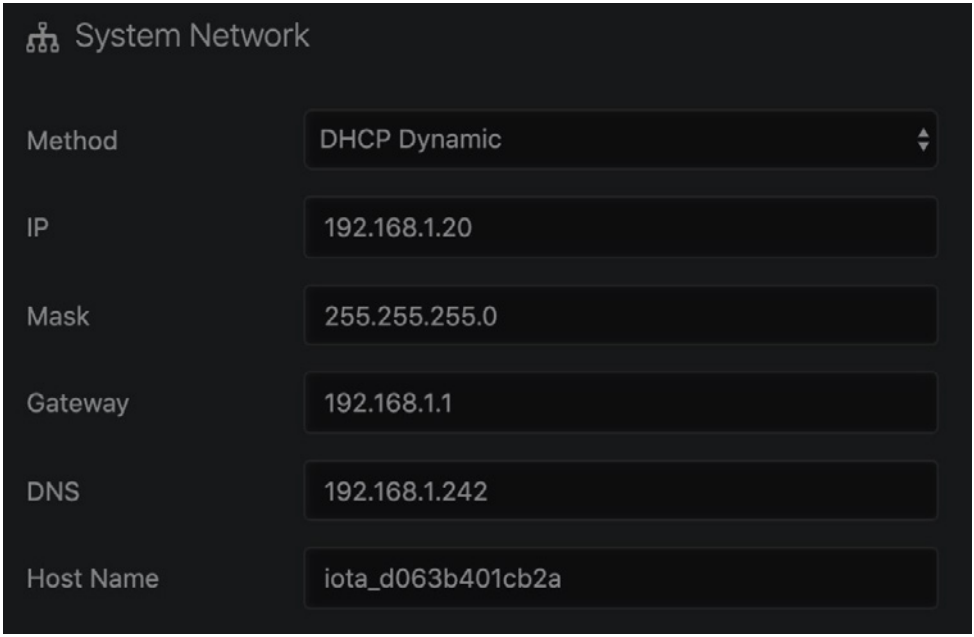
The system time is used by:

- 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.



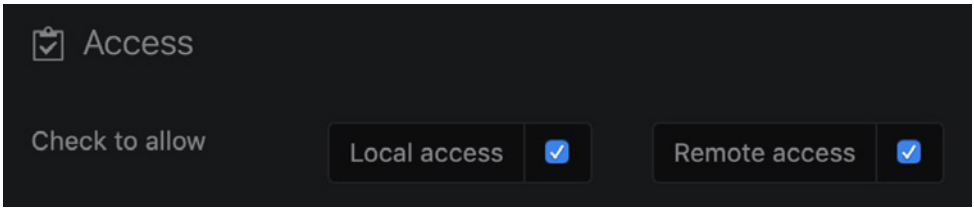
System Network

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



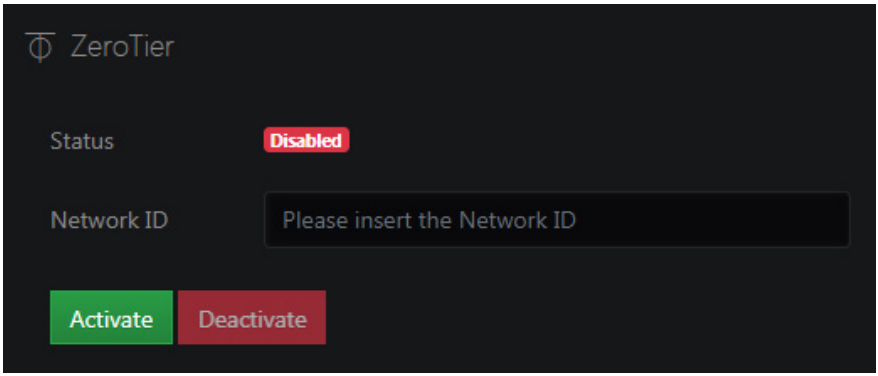
Access / Internal Firewall

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



ZeroTier

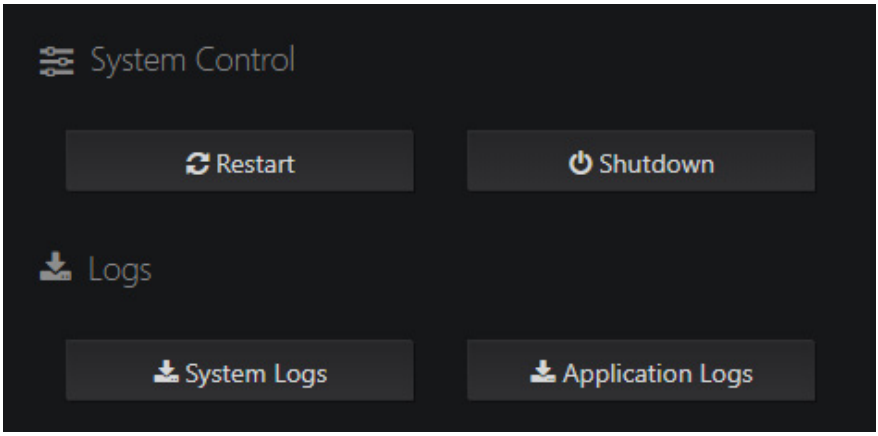
ZeroTier provides an easy way to remotely access the device via a P2P VPN and manage virtual networks on a cloud application.
(more information: www.zerotier.com)



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.

2.5 SWAPPING SSD

The procedure for swapping the SSD is as follows:

- Power off the device
- Unscrew the front panel
- Remove the drawer
- Remove the SSD
- Install the new SSD in the drawer
- Place the drawer in the device
- Tighten the front panel screw
- Power on the device

Note that it will take several minutes for the system to install on the new SSD (~4–5 minutes depending on the model of SSD).

The recommended SSD types are Samsung EVO 1 TB and 2 TB. They can be ordered directly from Profitap (sales@profitap.com).

CAPTURE GUIDE

3.1 CAPTURE CONTROL

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

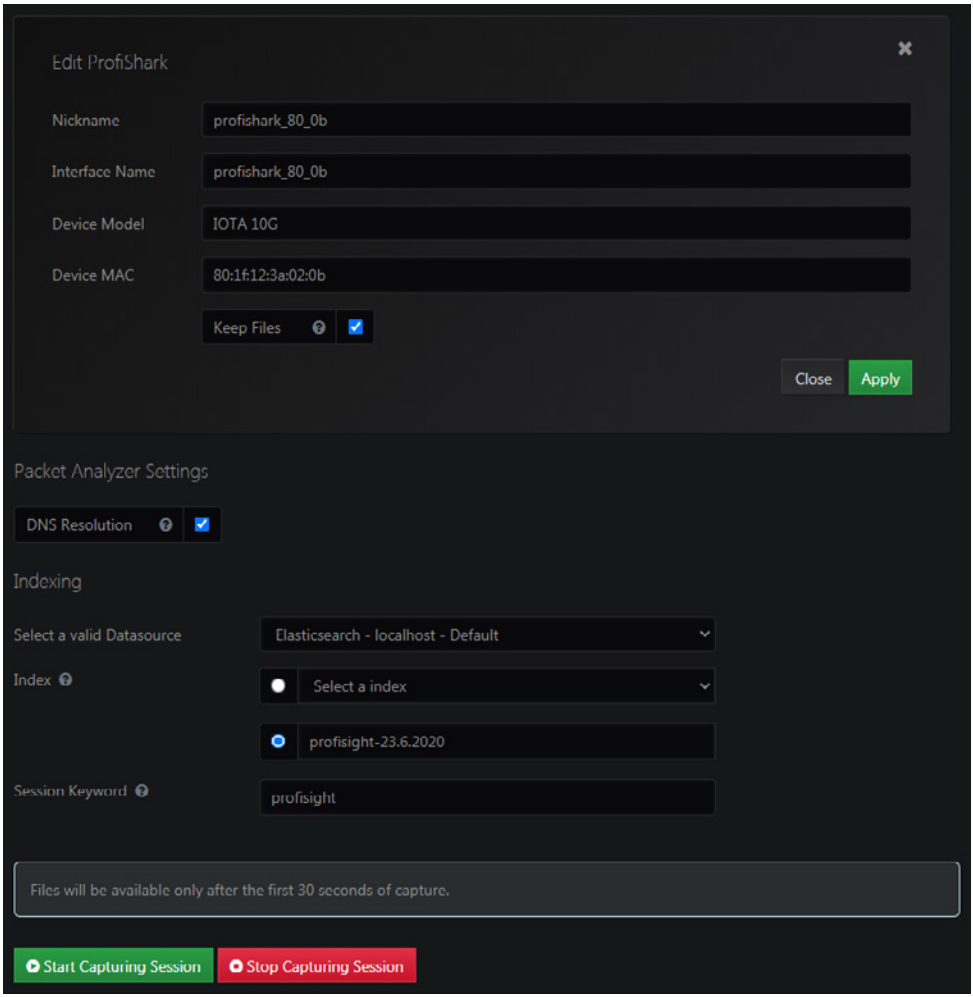
When a capture is in progress, the traffic is automatically indexed in the specified datasource. If the 'Keep Files' option is enabled in the capture interface's settings, the captured traffic is saved on the disk, with new files being automatically created either every 30 seconds, or when the current 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 ProfiShark
Nickname
profishark_80_0b
Interface Name
profishark_80_0b
Device Model
IOTA 10G
Device MAC
80:1f:12:3a:02:0b
Keep Files
Close
Apply
Packet Analyzer Settings
DNS Resolution
Indexing
Select a valid Datasource
Elasticsearch - localhost - Default
Index
Select a index
profisight-23.6.2020
Session Keyword
profisight
Files will be available only after the first 30 seconds of capture.
Start Capturing Session
Stop Capturing Session

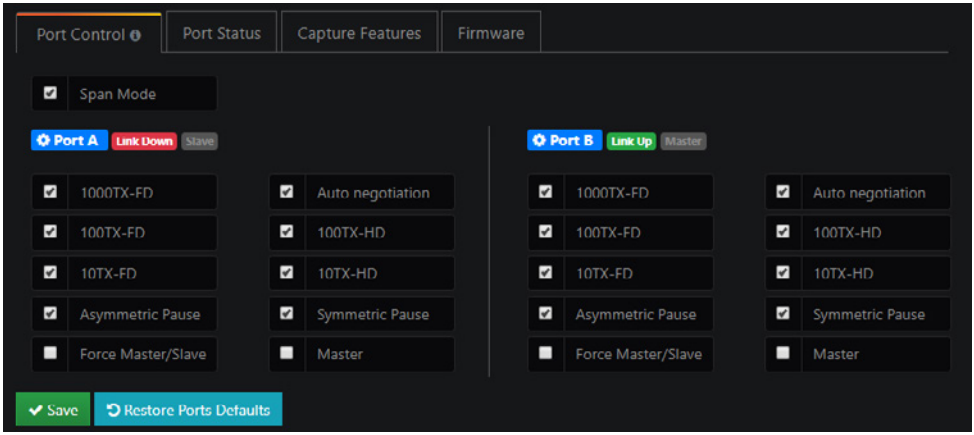
3.2 INTERFACE CONFIGURATION

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

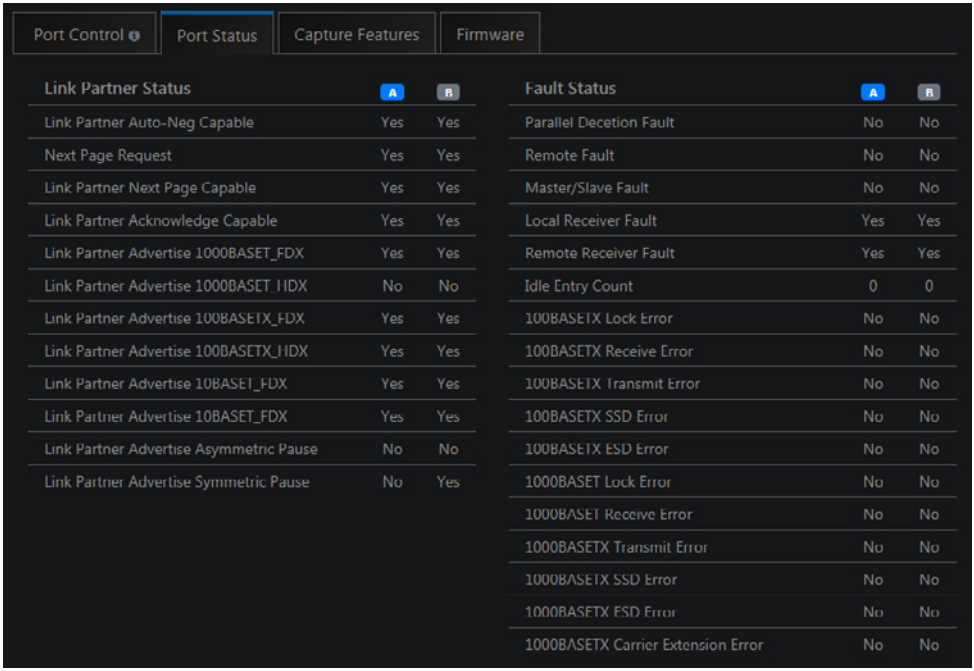
If IOTA is intended to be used in-line, the appropriate configuration must be set. 'In-Line mode' is the default mode ('Span Mode' checkbox unticked). IOTA can be set to SPAN Mode by ticking the 'Span Mode' checkbox.

Port speed and behavior can be set on this screen, for both port A and port B.

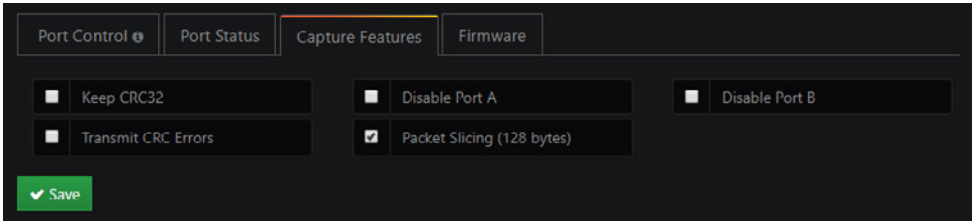


Port Status

This tab provides an overview of the Link Partner Status and Fault Status for both port A and B.



Capture Features

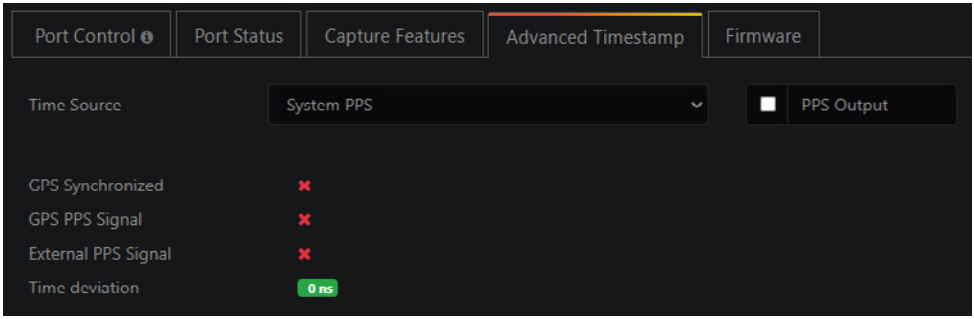


This tab allows the configuration of the following capture settings:

- Transmit CRC Errors
- Keep CRC32
- Packet Slicing (128 bytes)
- Disable Port A
- Disable Port B

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

Advanced Timestamp



Time Source

Select the source from which the time will be used for timestamping.

- System: Use the system time and ignore any PPS signal coming from the PPS port.
- System PPS: Use the system time and synchronize it with the PPS signal coming from the PPS port (if present).
- GPS: Use the time received from the GPS antenna connected to the GPS port (if present).

PPS Output

If checked, the PPS port will be set to output mode, sending out a PPS signal if the GPS is synchronized.

GPS Synchronized

Shows whether the GPS port is receiving time information from the GPS antenna.

GPS PPS Signal

Shows whether the GPS signal is stable enough for GPS PPS to be used.

External PPS Signal

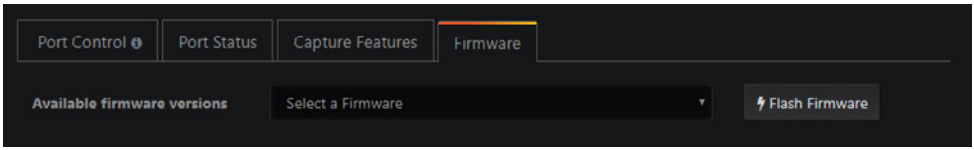
Shows whether the PPS port is receiving a PPS signal.

Time deviation

Shows the deviation between the internal clock and the reference (external PPS, GPS PPS, or system PPS).

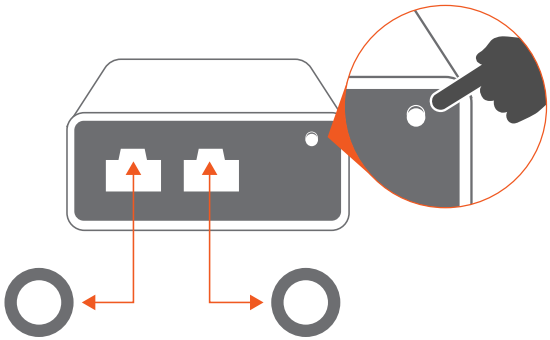
Firmware

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



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.

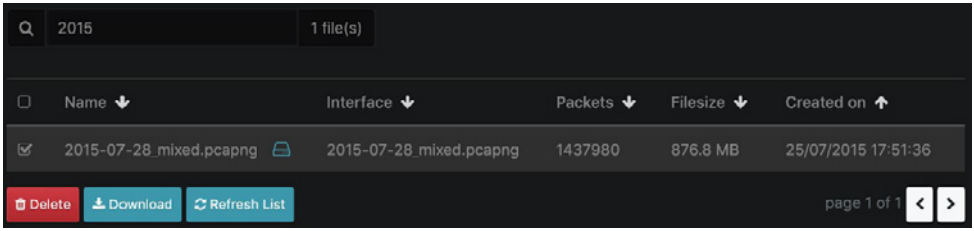
SHUTDOWN: Press and hold for 10 seconds for safe device shutdown. This will stop capture and unmount the internal disk in order to end capture session.

► 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

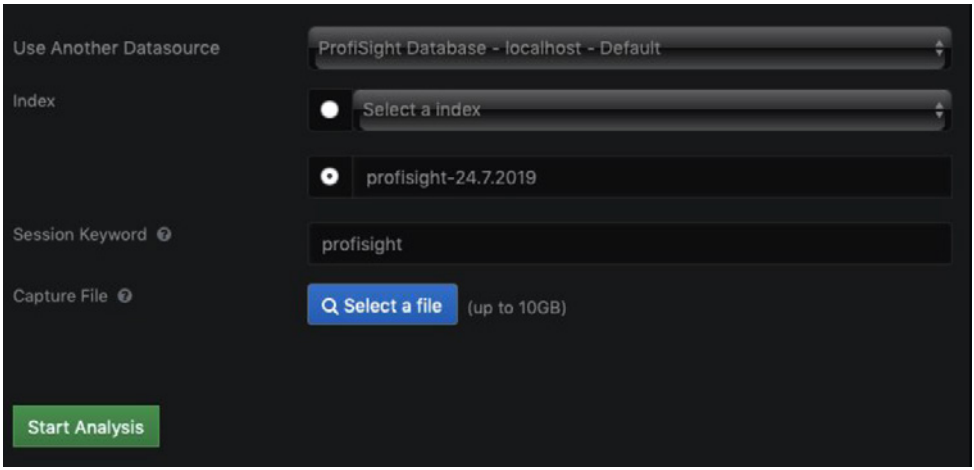
Captured Files

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.



Import a PCAP-NG

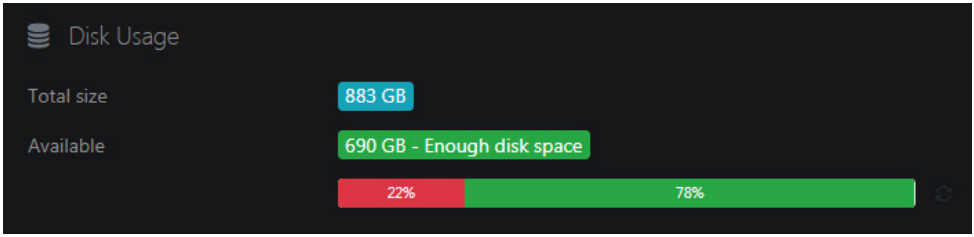
Importing a PCAP-NG or PCAP file to the IOTA can be done by clicking the 'Select a file' button, selecting the file, and clicking the 'Start Analysis' button. Once uploaded, set the time range of the dashboards to that of the file to ensure the graphs display the correct data.



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.



> ► Note: Capture data rotates once disk usage reaches 80%.

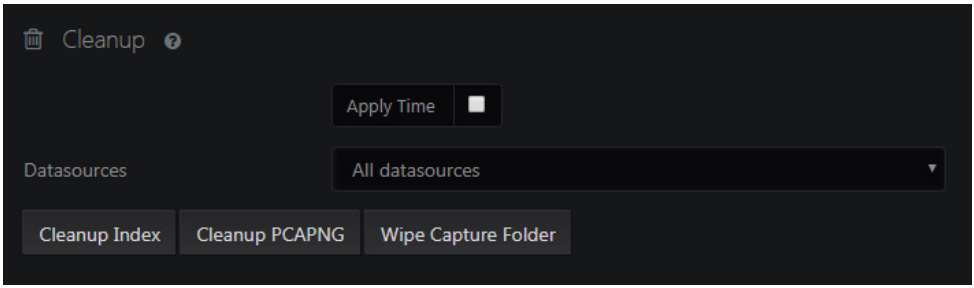
Schedule a Cleanup

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.

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

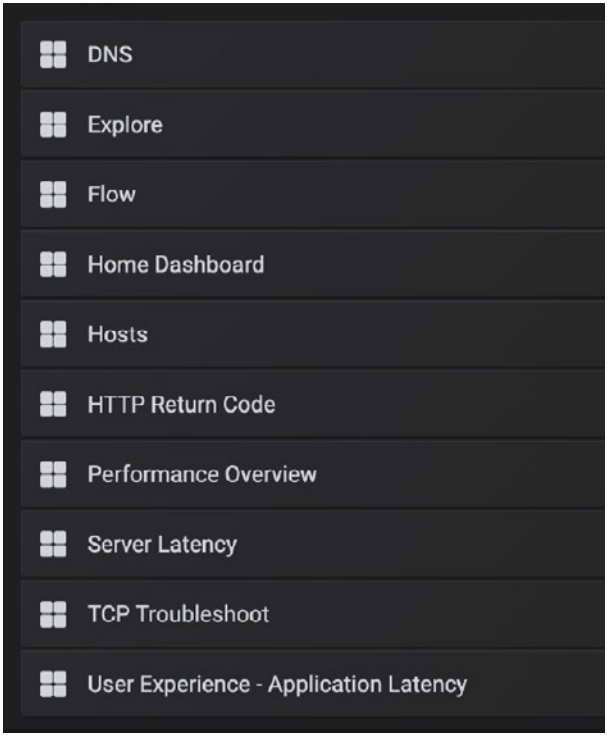
1. Main menu
2. Logout
3. Main dashboard selection
4. Time range selection
5. Dashboard area
6. Display filter
7. PCAP file download
8. Dashboard navigation with filters and time selection
9. Dashboard configuration

4.2 BASIC NAVIGATION

Main dashboard selection menu

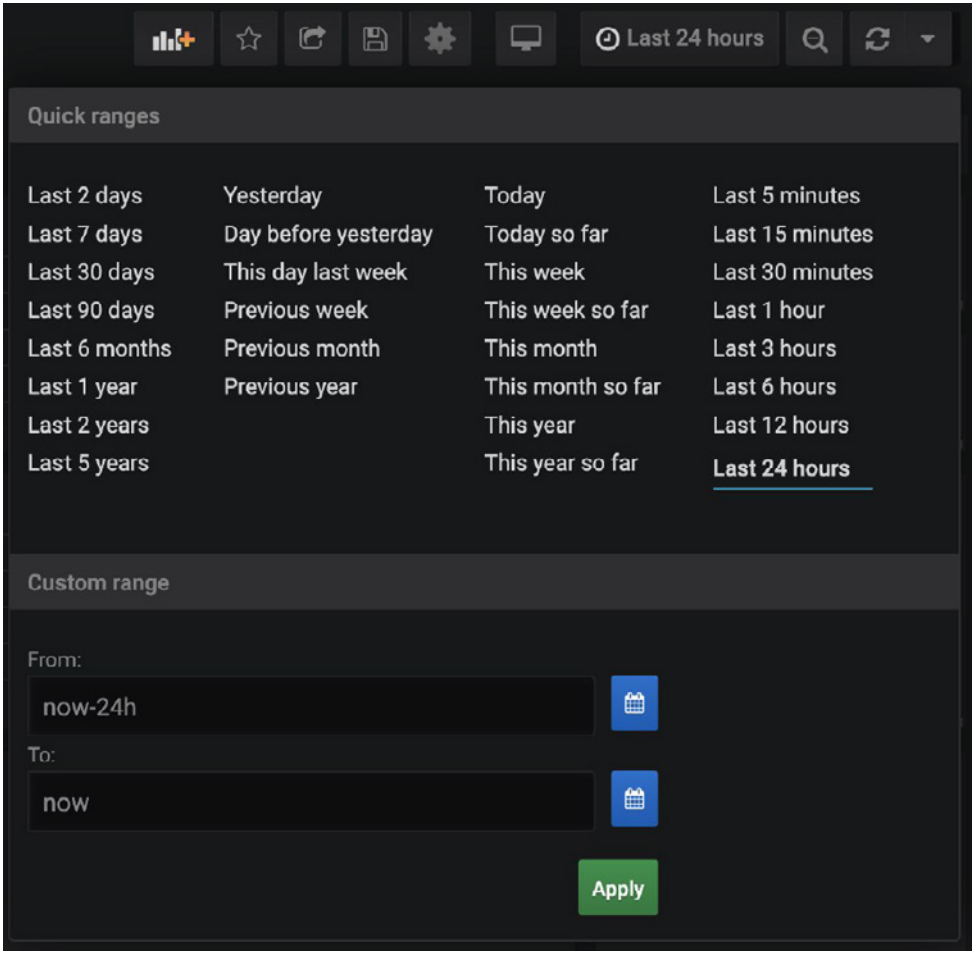
This menu displays all the available dashboards. The list of dashboards is non-exhaustive and will change over time to include new features and other improvements.

- 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.



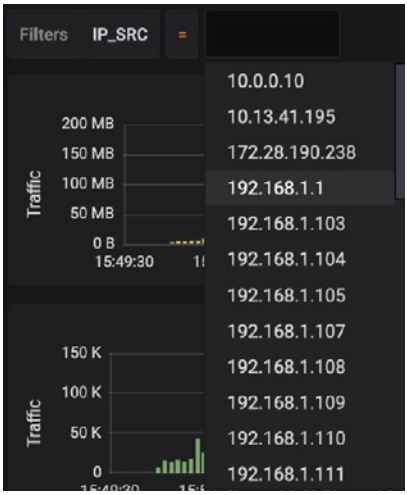
Time range selection

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

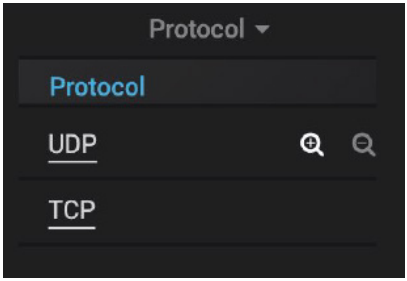


Filtering traffic

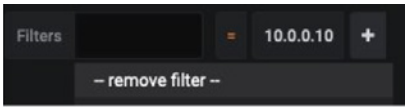
Display filters can be defined manually by clicking the + icon next to the Filter box (top left) and selecting the filter type and value it needs to filter on.



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

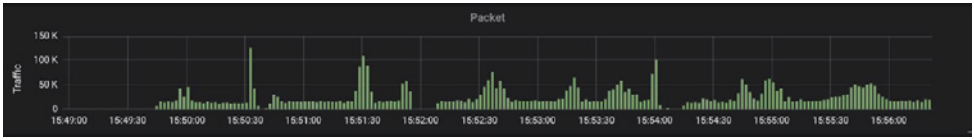


Filters can be removed by clicking the filter type again and selecting '--remove filter--'.

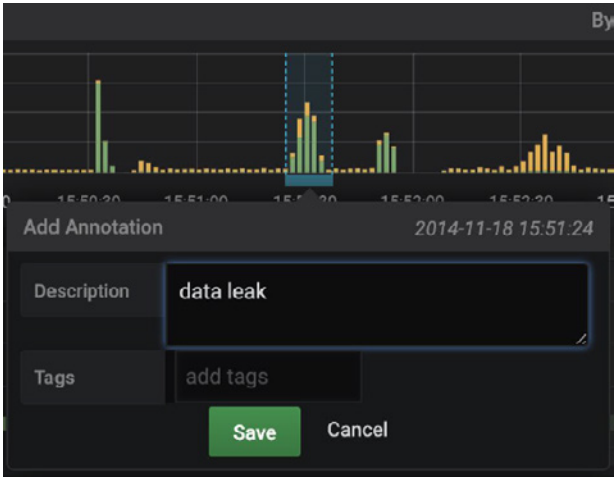


Graphs

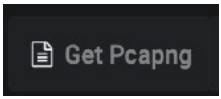
Click and drag to zoom in on a specific time range.



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



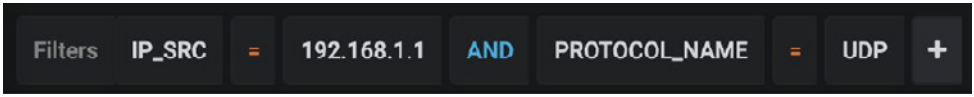
4.3 PCAP FILE DOWNLOAD



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

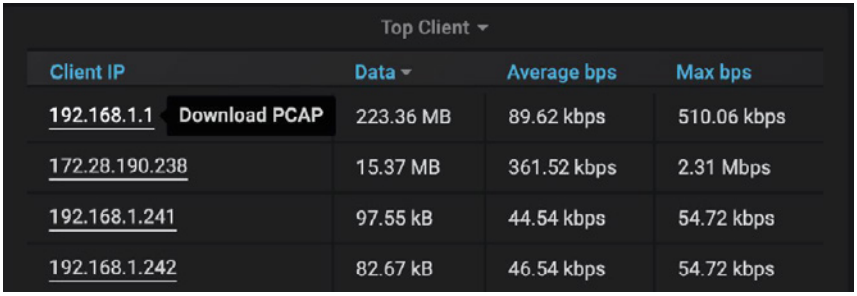


If a MAC address, IP address, or port is selected, the filter affects both source and destination.

Additional methods to download PCAP files:

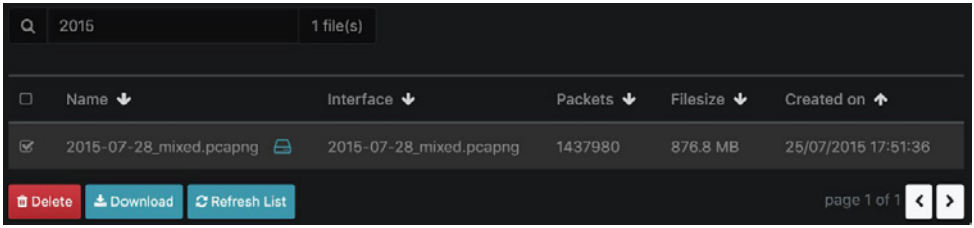
1 - Use the direct download link

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



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.



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PROFITAP HQ B.V. — High Tech Campus 9
5656 AE Eindhoven — The Netherlands

sales@profitap.com
www.profitap.com