

USE CASE

authUSB SafeDoor in industrial environments



What is the specific issue of Industrial environments regarding USB flash drives traffic?

Air Gapped networks have to use for both own and third-party processes (updates etc.) USB flash drives. Within these infrastructures, this use must be regulated and controlled. This control is done mainly through Firewalls and other elements that are dedicated to scanning USB sticks and isolated network traffic, looking for Malware threats, only at a software level.

Cyberattacks in industrial environments are not random in nature, but are perfectly thought out and targeted. Attackers know perfectly the environment where it will be carried out.

In addition, the increasingly frequent opening between IT and OT networks, causes many vulnerabilities, through USB devices, impacting immediately on the safety of the plants, up to this moment perfectly separated.

Hardware attacks (BadUSB) carried out via USB sticks, are very specific, targeted. The attacker knows precisely the system that is about to breach. Such threats are also undetectable, persistent over time and, in most cases, irreversible.

Finally it is the Electrical threat (USB Killer). This threat is intended to bring down the first layer of physical security in the organization in order to avoid the protocolization for the use of USB devices that have to access the network. Normally this previous takedown is given as part of a combined attack. An USB Killer would disable the dedicated equipment of the network with the purpose of carrying out a subsequent attack at a HW level. These ones are persistent in time and, what is most serious, undetectable, as much as nothing scans the HW of the computer.

Control at all levels of these devices is vital for the safety and operations inside the industrial chain.

What it is SafeDoor?

SafeDoor is a Hw deviced with embedded SW that acts as a barrier between USB sticks and an organization's computers by analyzing,blocking,informing,and auditing threats at three levels:

- Electrical: Identifying and stopping destructive UsbKiller-type surge attacks.
- Hardware: detecting and disabling BadUsb family attacks, HID (rubber ducky and similar) attacks, fake network cards, composite interfaces, etc.
In such attacks, the scan that SafeDoor performs of the device is based on the behavior of the device itself,not on attack patterns, which gets that.Even if the threats evolve, SafeDoor will always be able to detect them. This detection is done continuously and in real time.
- Software: With up to two integrated antiviruses, safeDoor performs a pre-download scan of any content.

SafeDoor thus enables protocolization in the use of USB devices within organizations. Once SafeDoor shows up that no threat is detected, we can manage safely through it all the information inside the USB device.

SafeDoor is certified under the Lince methodology and is part of the CCN, CPSTIC catalog.

*Protected under patent

How does SafeDoor fit into our work and cybersecurity scheme?

1. ACCESS CONTROLS

Fully autonomous installation of SafeDoor (Only connected to the Electrical network)
Through the built-in LEDs SafeDoor tells us whether the connected device is safe or not, performing the scanning at the three types of threats.(HW, SW and electrical)

2. DIRTY/CLEAN PORT

Port 1- (Dirty Port) The user connects to one of the usb ports of the SafeDoor device, the USB drive from outside the organization and whose information wants to safely dump into a new Pendrive. (Border Team)

Port 2- (Clean Port) In the second port of the SafeDoor device we connect the trustable prendrive, where we are going to dump the information. We manage to make sure that both , the information contained in it and the hardware itself, doesn't contain a threat of any kind.

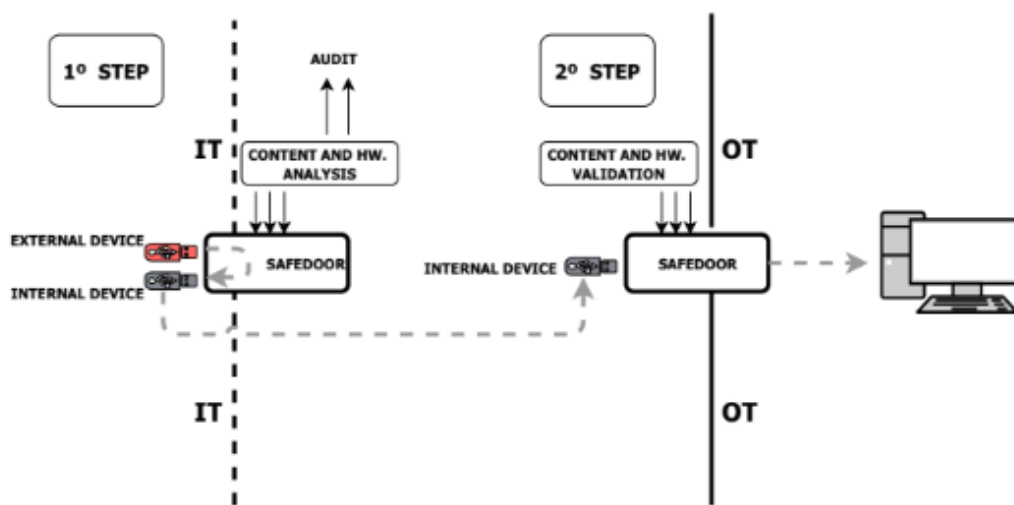
It is possible, if necessary, to establish a protocol for the use of **reliable devices** used within the organization.

SafeDoor also includes the possibility of using digital signature of the files that are downloaded to ensure its integrity.

3. INTERNAL NETWORK

Any USB device that enters or exits and is used in your organization, is pre-analyzed with SafeDoor and will never be connected directly to corporate devices. This prevents the different networks and communications between them, from any Hw, Electrical or Sw attack.

In all cases, the deployment of SafeDoor prevents the leaking of internal information from the organization through USB storage devices. There is the possibility of allowing it, under a strict protocol and always auditing this extraction through our Central Console.



FAQ:

1. **Maximum number of antiviruses embeded on SafeDoor***

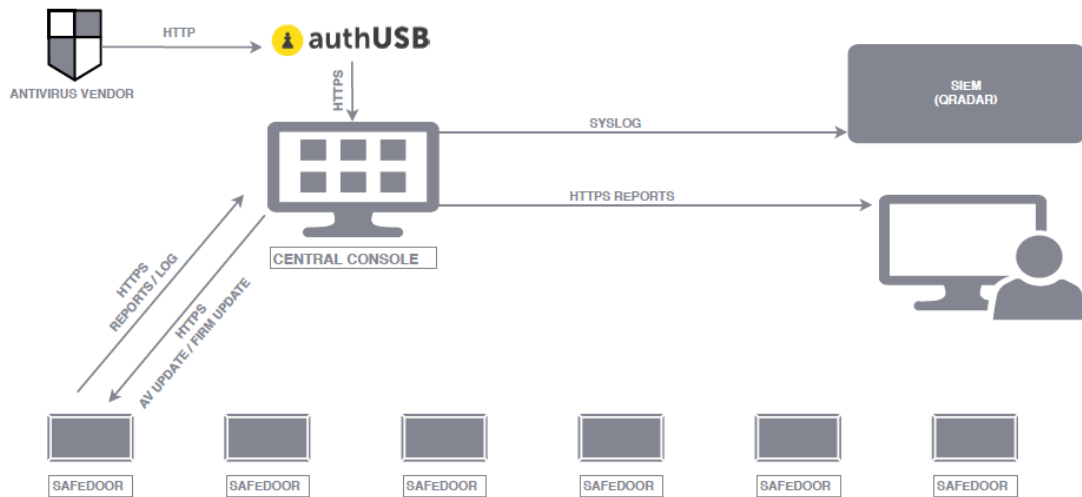
Safe Door supports up to two simultaneous antivirus engines. We can log it either to a metadefender machine or sending the files to a Sandbox.

*We can integrate more than two if necessary

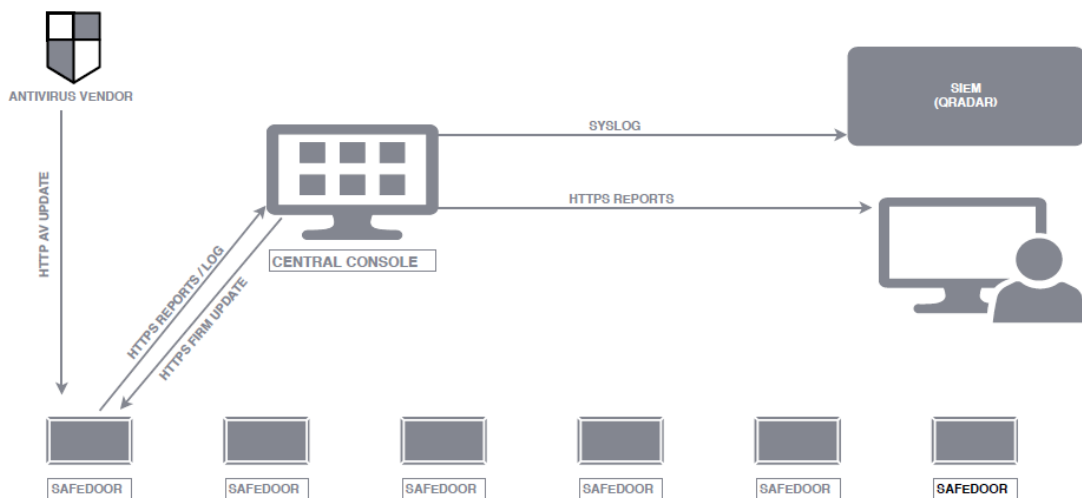
2. AV and our own SW Updates

There are three methods of updating signatures, depending on your environment:

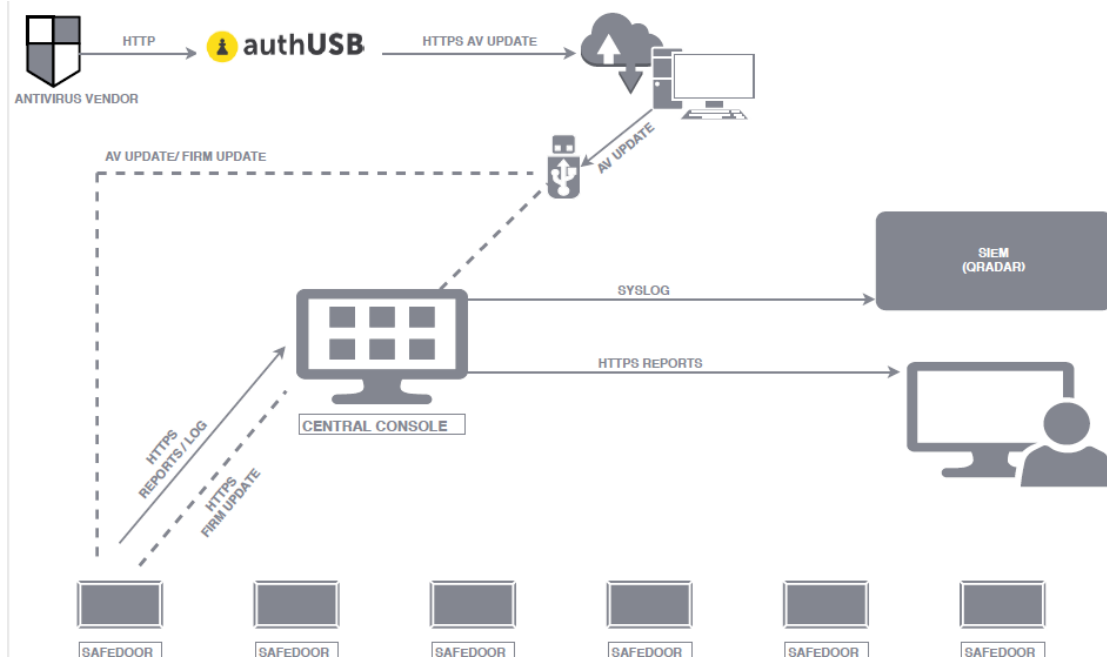
- **Direct.** If safedoor is outbound to the internet, either directly or via proxy, they are updated directly against the antivirus provider's server.



- **Indirect.** If the safeDoor does not have internet output but their central console does, they will use this as a mirror for the upgrade.



- **Offline.** We provide a tool (windows) to run from a computer with internet output, that will obtain the signatures and dump them on a USB stick. This memory can be connected to any safeDoor, which will be used as an update source. It can also be used to dump signatures to the central console (if it is on an isolated network) to act as a mirror for its associated safeDoor.



3. Scan levels to run (fast, full, selective,)

As soon as a memory is connected to safeDoor, hardware and electrical analysis is performed automatically. This analysis is very fast, just two seconds, although it continues to be continuously monitored until it is extracted.

For software scanning (antivirus) there are two modes of use:

- **Manual:** From SafeDoor's web browser, the user selects the files/folders to download. On these selected files, analysis is carried out by the antivirus (selective analysis)
- **Automatic:** Anti-virus scans all the contents of the memory reporting through Leds its progress and result. No need to access the web interface. The computer is autonomous (full analysis)

It is also possible to modify the default settings of antivirus engines (maximum size, depth levels in compressed files, extensions to be scanned...)

4. Average USB scanning time.

The scanning time is similar to that of a desktop computer, since the bottleneck is at the reading speed of the USBstick. With modern USB flash drives read speeds

of about 35 MB/s can be achieved, while with advertising memories or degraded by usage the speed can drop to 15/20 MB/s.

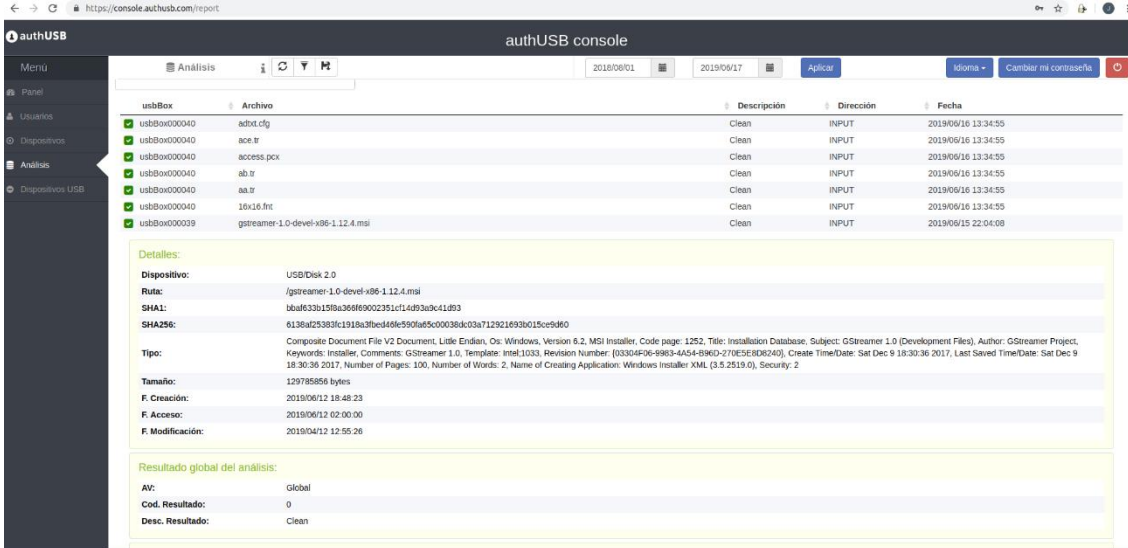
5. Log storage: device, console?

Each action performed on each safeDoor is dumped in real time onto the Center Console. In case of loss of connectivity or isolated computers these reports will be stored on the device, being possible to download (digitally signed) for subsequent loading to the central console manually through its web interface.

6. Maximum number of devices to manage from a central console

It is scalable depending on the hardware or configuration of the virtual machine on which you run. With 2 cores /16GB RAM 50 linked devices are supported.

7. Central console screens



The screenshot displays the 'authUSB console' web interface. The main content area shows a table of USB devices with columns for 'usbBox', 'Archivo', 'Descripción', 'Dirección', and 'Fecha'. Below the table, there is a 'Detalles:' section for a selected device, providing information such as 'Dispositivo: USB/Disk 2.0', 'Ruta: gstreamer-1.0-devel-x86-1.12.4.msi', 'SHA1:', 'SHA256:', 'Tipo:', 'Tamaño:', 'F. Creación:', 'F. Acceso:', and 'F. Modificación:'. At the bottom, there is a 'Resultado global del análisis:' section with fields for 'Av:', 'Cod. Resultado:', and 'Desc. Resultado:'.

usbBox	Archivo	Descripción	Dirección	Fecha
usbBox000040	adrot.ctg	Clean	INPUT	2019/06/16 13:34:55
usbBox000040	ace.tr	Clean	INPUT	2019/06/16 13:34:55
usbBox000040	access.pcx	Clean	INPUT	2019/06/16 13:34:55
usbBox000040	ab.tr	Clean	INPUT	2019/06/16 13:34:55
usbBox000040	aa.tr	Clean	INPUT	2019/06/16 13:34:55
usbBox000040	16x16.fnt	Clean	INPUT	2019/06/16 13:34:55
usbBox000039	gstreamer-1.0-devel-x86-1.12.4.msi	Clean	INPUT	2019/06/15 22:04:08

Detalles:

Dispositivo: USB/Disk 2.0
Ruta: gstreamer-1.0-devel-x86-1.12.4.msi
SHA1: b6af633b159a366f9022351c11493a9c41893
SHA256: 6136a25383fc1319a3fbed468e590fa5c00036dk03a712921693b015ce9d#0
Tipo: Composite Document File V2 Document, Little Endian, Os: Windows, Version 6.2, MSI Installer, Code page: 1252, Title: Installation Database, Subject: GStreamer 1.0 (Development Files), Author: GStreamer Project, Keywords: Installer, Comments: GStreamer 1.0, Template: Intel:1033, Revision Number: {03304D6-6983-4A54-B96D-270E5E8D8240}, Create Time/Date: Sat Dec 9 18:30:36 2017, Last Saved Time/Date: Sat Dec 9 18:30:36 2017, Number of Pages: 100, Number of Words: 2, Name of Creating Application: Windows Installer XML (3.5.2519.0), Security: 2
Tamaño: 129785856 bytes
F. Creación: 2019/06/12 18:48:23
F. Acceso: 2019/06/12 02:00:00
F. Modificación: 2019/04/12 12:55:26

Resultado global del análisis:

Av: Global
Cod. Resultado: 0
Desc. Resultado: Clean

clean file capture

The screenshot shows the 'authUSB console' interface. The main area displays a table of USB devices with columns for device ID, manufacturer, product, and date. A detailed view for a device is shown below the table, including manufacturer information and a partition table.

Dispositivos USB	Manufacturer	Product	Date
usb8ox000037	authUSB	Local Storage	2019/06/17
usb8ox000037	Generic	Mass Storage	92882501
usb8ox000037	authUSB	Local Storage	2019/04/29 01:30:39
usb8ox000037	authUSB	Local Storage	2019/04/29 01:28:19
usb8ox000037	authUSB	Local Storage	2019/04/29 01:14:56
usb8ox000037	authUSB	Local Storage	2019/04/29 00:46:27
usb8ox000037	Generic	Mass Storage	92882501
usb8ox000037	authUSB	Local Storage	2019/04/29 00:47:35
usb8ox000030	authUSB	Local Storage	2019/04/29 00:38:50
usb8ox000030	Kingston	DataTraveler 3.0	0660e6b6615f260b7233886
usb8ox000030	ATMEL AVR	HID Keyboard	2019/04/18 00:21:05
usb8ox000030	No a storage device	HID Keyboard	2019/04/18 00:18:39
usb8ox000030	Killer detected (USB2)	USBKILL	0
usb8ox000030	USBKILL	USBKiller	0
usb8ox000030	USBKILL	USBKiller	0
usb8ox000030	authUSB	Local Storage	2019/04/18 00:12:01
usb8ox000040	USB2.0	Flash Disk	2019/03/0710210562
usb8ox000040	ATMEL AVR	HID Keyboard	2019/01/15 12:12:47
usb8ox000040	USB2.0	HID Keyboard	2019/01/15 12:11:40
usb8ox000040	USB2.0	Flash Disk	2019/03/0710210562
usb8ox000040	USBKILL	USBKiller	0
usb8ox000040	Killer detected (USB1)	USBKILL	0

Detalles:

Fabricante: USBKILL
 Cod. Fabricante: USBKILL
 Producto: USBKiller
 Cod. Producto: USBKiller
 Serial: 0

Particiones:

Etiqueta	Formato	Tamaño	Oculto

SW threat

The screenshot shows the 'authUSB console' interface with the 'Análisis' (Analysis) tab selected. It displays a table of files with columns for file name, description, direction, and date. A detailed view for a file is shown below the table, including SHA1 and SHA256 hashes, file type, and analysis results.

usbBox	Archivo	Descripción	Dirección	Fecha
usbBox000040	eicar.com	Infected	INPUT	2019/06/16 13:36:21
usbBox000039	eicar.com	Infected	INPUT	2019/06/15 22:02:46
usbBox000039	win32.exe	Infected	INPUT	2019/05/23 21:50:03
usbBox000039	warmacy.exe	Infected	INPUT	2019/05/23 21:50:03
usbBox000039	ArdamaxKeylogger	Infected	INPUT	2019/05/23 21:50:03
usbBox000039	eicar.com	Infected	INPUT	2019/05/23 21:50:03
usbBox000039	win32.exe	Infected	INPUT	2019/05/23 21:46:12
usbBox000039	e801e9bc9eb5bbea545ef4d01b5f1071661840480439c6e5babe8e08e41aa.exe	Infected	INPUT	2019/05/23 21:46:12
usbBox000039	ArdamaxKeylogger_E33AF9E602CBB7AC3634C2606150DD18	Infected	INPUT	2019/05/23 21:46:12

Detalles:

Dispositivo: USB2.0/Flash Disk
 Ruta: /keylogger/Ardamax/ArdamaxKeylogger_E33AF9E602CBB7AC3634C2606150DD18
 SHA1: 8fec9bc137822bc1d8ff39c35fedc3b6470e3fe
 SHA256: 6cd70eac48bc4e41aac1f0c3c08d26e6d8b37f197708a70321236d8b6b75
 Tipo: PE32 executable (GUI) Intel 80386, for MS Windows
 Tamaño: 802724 bytes
 F. Creación: 2019/05/23 19:43:51
 F. Acceso: 2019/05/23 02:00:00
 F. Modificación: 2019/06/06 16:22:30

Resultado global del análisis:

AV: Global
 Cod. Resultado: 1
 Desc. Resultado: Infected
 Amenaza: Win32/KeyLogger.Ardamax.NBB.application

HW threat

8. Download of files

The first and mandatory step to download a file is the Software (antivirus) scan. In case of threat detection in any of the files, in no case will the user be able to download that one specifically. In case the rest of files are free of threats, the user could be able to download them:

- 1) Into the user PC
- 2) Into a USB flash drive connected to SafeDoor
- 3) Into a previously configured folder.

