

# Security Assessment of IoT Devices and Services

By: José Ramón Monleón

# What is happening?

Thousands of attacks aimed at client routers ...  
... botnets like Satori, Matusa ... Leaks ...

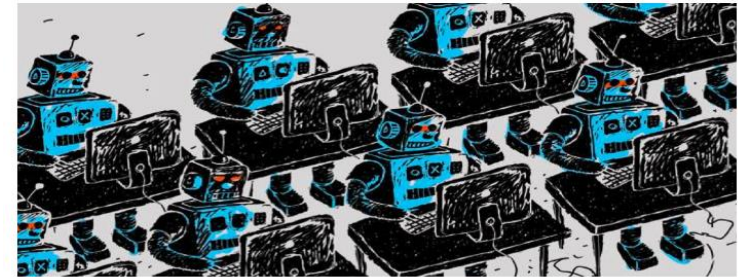
Technology | CyberSecurity

## What is Masuta? Hacker Nexus Zeta behind Satori botnet creates new Mirai 'master' variant

■ The Masuta botnet uses a weaponised router exploit to recruit more vulnerable IoT devices and expand.

Source: <https://www.ibtimes.co.uk/what-masuta-hacker-nexus-zeta-behind-satori-botnet-creates-new-mirai-master-variant-1656572>

Masuta : Satori Creators' Second Botnet Weaponizes A New Router Exploit.



Source: <https://blog.newskysecurity.com/masuta-satori-creators-second-botnet-weaponizes-a-new-router-exploit-2ddc51cc52a7>



Source: <https://informationisbeautiful.net/visualizations/worlds-biggest-data-breaches-hacks/>

## Google to shut down Google+ after failing to disclose user data leak

Company didn't disclose leak for months to avoid a public relations headache and potential regulatory enforcement

Source:

<https://www.theguardian.com/technology/2018/oct/08/google-plus-security-breach-wall-street-journal>

# Environment



## Internet of Things Landscape 2018

### APPLICATIONS (VERTICALS)

PERSONAL	HOME	VEHICLES	ENTERPRISE	INDUSTRIAL INTERNET
<b>WEARABLES</b> Apple WATCH, Samsung Gear2, Moto 360, LG, CAEDEN, Tado, iBeacon, Casewise, roost, OLIFX, Paro, FURU, Motiv, WEARABLE X, Jewelbots, RINGLY, Token	<b>Automation</b> nest, Honeywell, SAMSUNG, CHAMBERLAIN, SAVANT, tado, iBeacon, Casewise, roost, OLIFX, Paro, FURU, Secovent, AKEEN, OULTRON, LEVIN, Sphero, Tails, Gobot	<b>Auto</b> Piaget, AEMAP, Sphero, Aroon, VULNER, REFUG, SKYWATCH, zipline, Keyport, AEMAP, Sphero, Aroon, VULNER, REFUG, SKYWATCH, zipline, Keyport, AEMAP, Sphero, Aroon, VULNER, REFUG, SKYWATCH, zipline	<b>Manufacturing</b> STANLEY, verily, Sotera, Modrobotics, profibus, Geneonics, A.M. MONTEIR, Sphero, VitalConnect, Dorian, KALLIMEDIX, HANES, Newson, AIR STAR LP, AMICO, HANES, Newson, AIR STAR LP, AMICO, HANES, Newson, AIR STAR LP, AMICO	<b>MACHINES</b> ENTERPRISE, SIEMENS, Bosch, Alivium, Arch, Pricer, relayr, TULIP, Schuler, Itron, ENERDOC, TACHYUS, SolarCity, e-on, Trilliant, Hyperbase, ARCON, safety, lucid, OS, Prisma, Enlighted, enlghted, thinkcco, ENVOY, ENERGEN, ENERGEN, ENERGEN, ENERGEN
<b>FINES</b> Fitbit, Garmin, Under Armour, Fitbit, Garmin, Under Armour, Fitbit, Garmin, Under Armour	<b>BIOS</b> nest, SYSTEON, iris, BOSCH, Verizon, Essential, Control4, Qconstrange, Plant, Ivoce, Rule, NEXIA, LifeSmart, IOTAS	<b>Autonomous</b> W, Apple, CYCEN, OPTIMUS, TESLA, UBER, Google, CYCEN, OPTIMUS, TESLA, UBER, Google, CYCEN, OPTIMUS, TESLA, UBER, Google	<b>IT/IS</b> Red Hat, PUNHARE, ICLIX, Ductid, business, PRISM, Percolate, Ltheatro, cloudtags, Blue Bob, COMBAT, VARIABLE, dor	<b>Energy</b> SUPER GRID & LOGIC, SMARTDRIVE, Telogis, Impulz, GREENROAD, CODE, Dinn, TEGO, RECONOVA, ABB, KUKA, ABB, KUKA, ABB, KUKA
<b>HEALTH</b> NOKIA, Health, VIVO, SCANADU, AliveCor, Propeller, Gingerio, Health, Seospace, Thync, NeuroSky, sango, beckett, NOKIA, Health, VIVO, SCANADU, AliveCor, Propeller, Gingerio, Health, Seospace, Thync, NeuroSky, sango, beckett	<b>SECURITY</b> ASSA ABLITY, ring, LORICENTRE, smart, Avigilon, LORICENTRE, smart, Avigilon, LORICENTRE, smart, Avigilon	<b>VIDEO PLATFORMS</b> Google Home, HomePod, Echo, Amazon, Google Home, HomePod, Echo, Amazon	<b>SMART CITIES &amp; INFRASTRUCTURE</b> LogMa, Robin, Sagem, City, View, LogMa, Robin, Sagem, City, View	<b>INDUSTRIAL WEARABLES</b> DLASS, CASS, UPASKILL, A ATREED, DLASS, CASS, UPASKILL, A ATREED
<b>LIFESTYLE &amp; ENTERTAINMENT</b> SONOS, ROLI, PRYNT, RADEN, SONOS, ROLI, PRYNT, RADEN	<b>EMERGENCY</b> June, nómiku, KUIVER, ember, drop, portny, hulu, June, nómiku, KUIVER, ember, drop, portny, hulu	<b>NAVIGATION</b> WAZE, NAVIGATION, WAZE, NAVIGATION	<b>SMART CITIES &amp; INFRASTRUCTURE</b> LogMa, Robin, Sagem, City, View, LogMa, Robin, Sagem, City, View	<b>INDUSTRIAL WEARABLES</b> DLASS, CASS, UPASKILL, A ATREED, DLASS, CASS, UPASKILL, A ATREED
<b>SPORTS</b> STRAVA, ZEPPEL, STRAVA, ZEPPEL	<b>CONSUMER ROBOTICS</b> Jibo, iRobot, Sphero, Jibo, iRobot, Sphero	<b>SMART &amp; AVIATION</b> AERIS, AERIS, AERIS, AERIS	<b>SMART CITIES &amp; INFRASTRUCTURE</b> LogMa, Robin, Sagem, City, View, LogMa, Robin, Sagem, City, View	<b>INDUSTRIAL WEARABLES</b> DLASS, CASS, UPASKILL, A ATREED, DLASS, CASS, UPASKILL, A ATREED

### PLATFORMS (HORIZONTALS)

SOFTWARE	SECURITY	CONNECTIVITY	ANALYTICS	DEVELOPER	PAYMENTS & MONEY	INTERFACES	3D
<b>FULL STACK</b> Cisco, PTC, Leonardo, BOSCH, relayr, PTC, Leonardo, BOSCH, relayr	<b>SECURITY</b> Symantec, McAfee, THALES, Bitdefender, Symantec, McAfee, THALES, Bitdefender	<b>CONNECTIVITY</b> ALIEN, zigfox, ALIEN, zigfox	<b>ANALYTICS</b> Splunk, Cloudera, Splunk, Cloudera	<b>DEVELOPER</b> Particle, ARTIK, Particle, ARTIK	<b>PAYMENTS &amp; MONEY</b> PayPal, VISA, Square, shopify, PayPal, VISA, Square, shopify	<b>INTERFACES</b> Virtual Reality, AR, VR, Virtual Reality, AR, VR	<b>3D</b> Shapeways, Matterport, Shapeways, Matterport
<b>MIDDLEWARE</b> Oracle, SAP, SAP, Oracle, SAP	<b>SECURITY</b> McAfee, McAfee, McAfee, McAfee	<b>CONNECTIVITY</b> ALIEN, zigfox, ALIEN, zigfox	<b>ANALYTICS</b> Splunk, Cloudera, Splunk, Cloudera	<b>DEVELOPER</b> Particle, ARTIK, Particle, ARTIK	<b>PAYMENTS &amp; MONEY</b> PayPal, VISA, Square, shopify, PayPal, VISA, Square, shopify	<b>INTERFACES</b> Virtual Reality, AR, VR, Virtual Reality, AR, VR	<b>3D</b> Shapeways, Matterport, Shapeways, Matterport

### BUILDING BLOCKS

HARDWARE	INFRASTRUCTURE	CONNECTIVITY	PARTNERS
<b>MOBILE DEVICES</b> Intel, Qualcomm, TOSHIBA, Atmel, GFM, LG, SIEMENS, Intel, Qualcomm, TOSHIBA, Atmel, GFM, LG, SIEMENS	<b>Cloud</b> Google Cloud Platform, Amazon, Microsoft Azure, Google Cloud Platform, Amazon, Microsoft Azure	<b>PROTOCOLS</b> WiFi, Bluetooth, zigbee, LoRa, NB-IoT, MQTT, WiFi, Bluetooth, zigbee, LoRa, NB-IoT, MQTT	<b>CONTROL/OPERATION SERVICES</b> Amazon, Walmart, Amazon, Walmart
<b>SERVERS</b> HP, Dell, HP, Dell	<b>EDGE COMPUTING</b> Azure IoT Edge, SAP, Leonardo, HPE Edgeline IoT Systems, Azure IoT Edge, SAP, Leonardo, HPE Edgeline IoT Systems	<b>TELECOM</b> Verizon, AT&T, Sprint, Verizon, AT&T, Sprint	<b>MANUFACTURING</b> Foxconn, Jabil, Foxconn, Jabil
<b>OPERATING SYSTEMS</b> iOS, android, BlackBerry, iOS, android, BlackBerry	<b>MOBILE OS</b> iOS, android, BlackBerry, iOS, android, BlackBerry	<b>SEMICONDUCTORS</b> Intel, Samsung, Intel, Samsung	<b>STARTUPS</b> Kickstarter, Kickstarter

# Certification Guidelines



# Initiatives in progress



## GSMA IoT Security Guidelines (February 2016)

Promoting best practice for the secure design, development and deployment of IoT services, and providing a mechanism to evaluate security measures, the GSMA IoT Security Guidelines and IoT Security Assessment help create a secure IoT market with trusted, reliable services that can scale as the market grows.



## ECSO: European Cyber Security Organization (October 2016)

July 2016 European Commission signs an agreement with the private sector to develop a common framework a market in cybersecurity.



## ENISA: European Union Agency for Network and Information Security

June 2018 the European Commission grants permanent status to the EU Cybersecurity Agency.



## ETSI: European Telecommunications Standards Institute

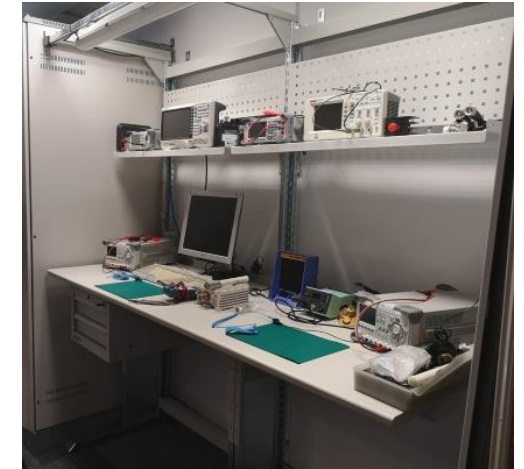
19 February 2019. The ETSI Technical Committee on Cybersecurity (TC CYBER) has just released *ETSI TS 103 645*, a standard for cybersecurity in the Internet of Things, to establish a security baseline for internet-connected consumer products and provide a basis for future IoT certification schemes.

# What are we doing?

## Intelligent Security for IoT

Center of excellence for devices, CPEs and IoT, for control and security audits of Orange and Jazztel routers and IoT

- Security flaws detection
- Security incidents prevention
- Security certifications
- Replication of client scenarios in controlled environments





**Thanks**  
**Gracias**