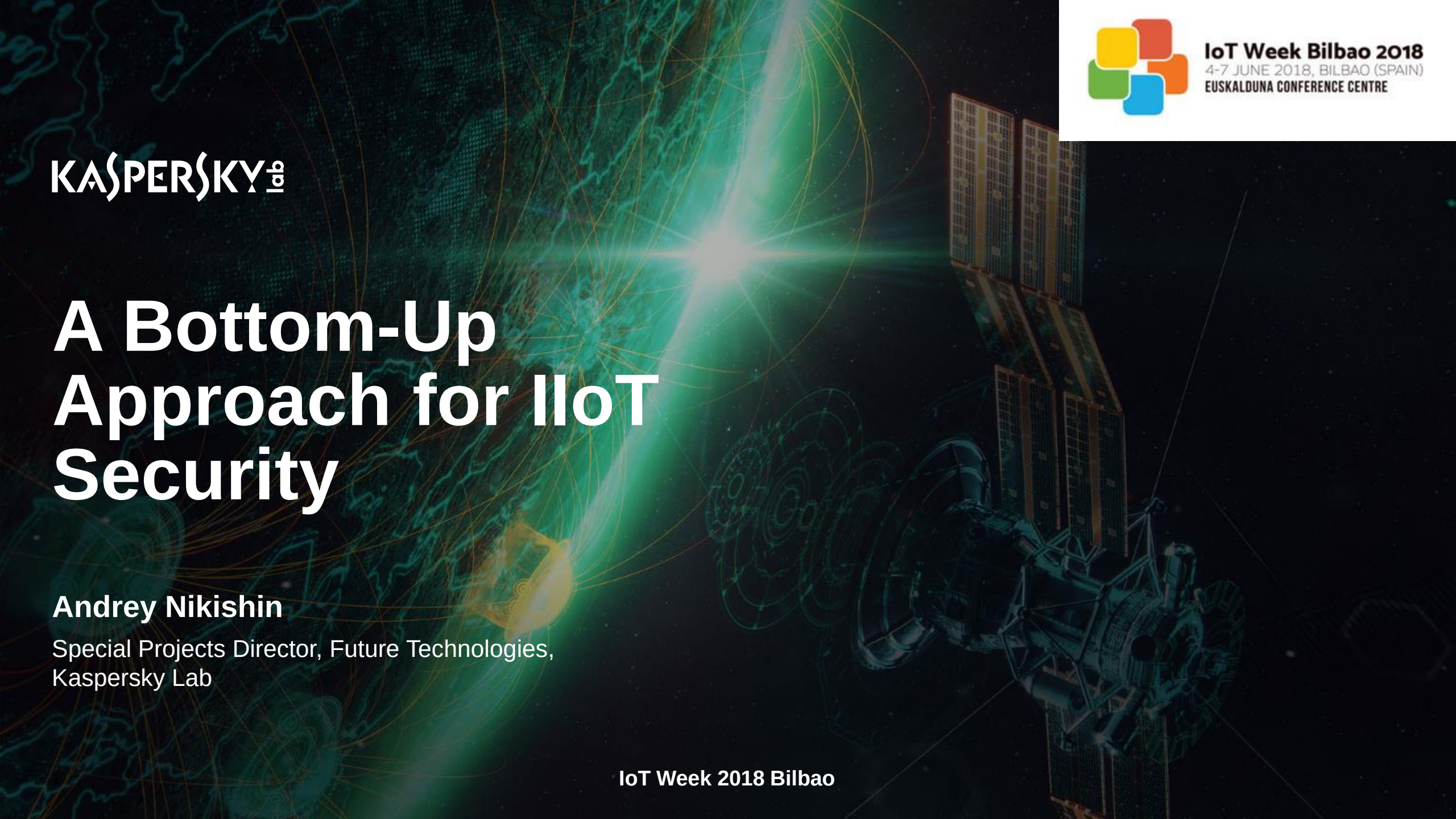


A Bottom-Up Approach for IIoT Security

Andrey Nikishin

Special Projects Director, Future Technologies,
Kaspersky Lab

What is IoT?

> «*The **interconnection** via the Internet of computing devices **embedded in everyday objects**, enabling them to **send** and **receive** data*».
>
> – Google

> *Internet of Things (IoT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers and the **ability to transfer data** over a network **without requiring human-to-human** or **human-to-computer interaction**.*
>
> http://internetofthingsagenda.techtarget.com/definition/Internet-of-Things-IoT

> *The Internet of Things (IoT) is the inter-networking of physical devices, vehicles, buildings, and other items embedded with electronics, software, sensors, actuators, and network connectivity which enable these objects to collect and exchange data. The IoT allows objects to be sensed or controlled remotely across existing network infrastructure, creating opportunities for more direct **integration of the physical world into computer-based systems**, and resulting in improved efficiency, accuracy and economic benefit in addition to reduced human intervention.*
>
> https://en.wikipedia.org/wiki/Internet_of_things

What is smart IoT?

> **Internet of Things (IoT)**
>
> – is a system of embedded connected **cyber-physical** devices that have ability to transfer data over a network without requiring human-to-human or human-to-computer interaction and more importantly **can have an ability to make a decision without such interaction**
>
> – Google

How we see IoT

Smart camera

Smart light

Smart socket

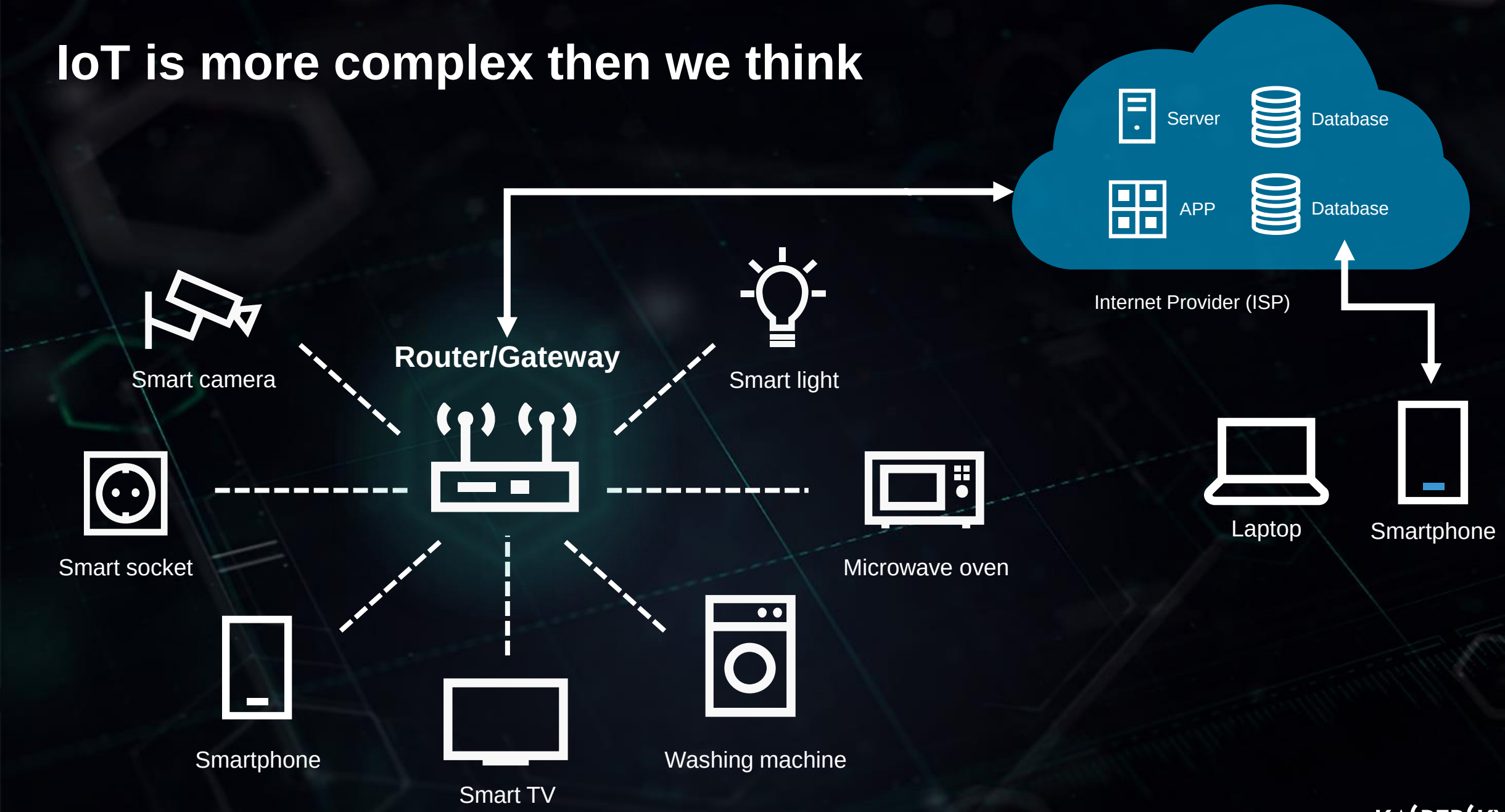
Microwave oven

Washing machine

Smartphone

Smart TV

IoT is more complex then we think



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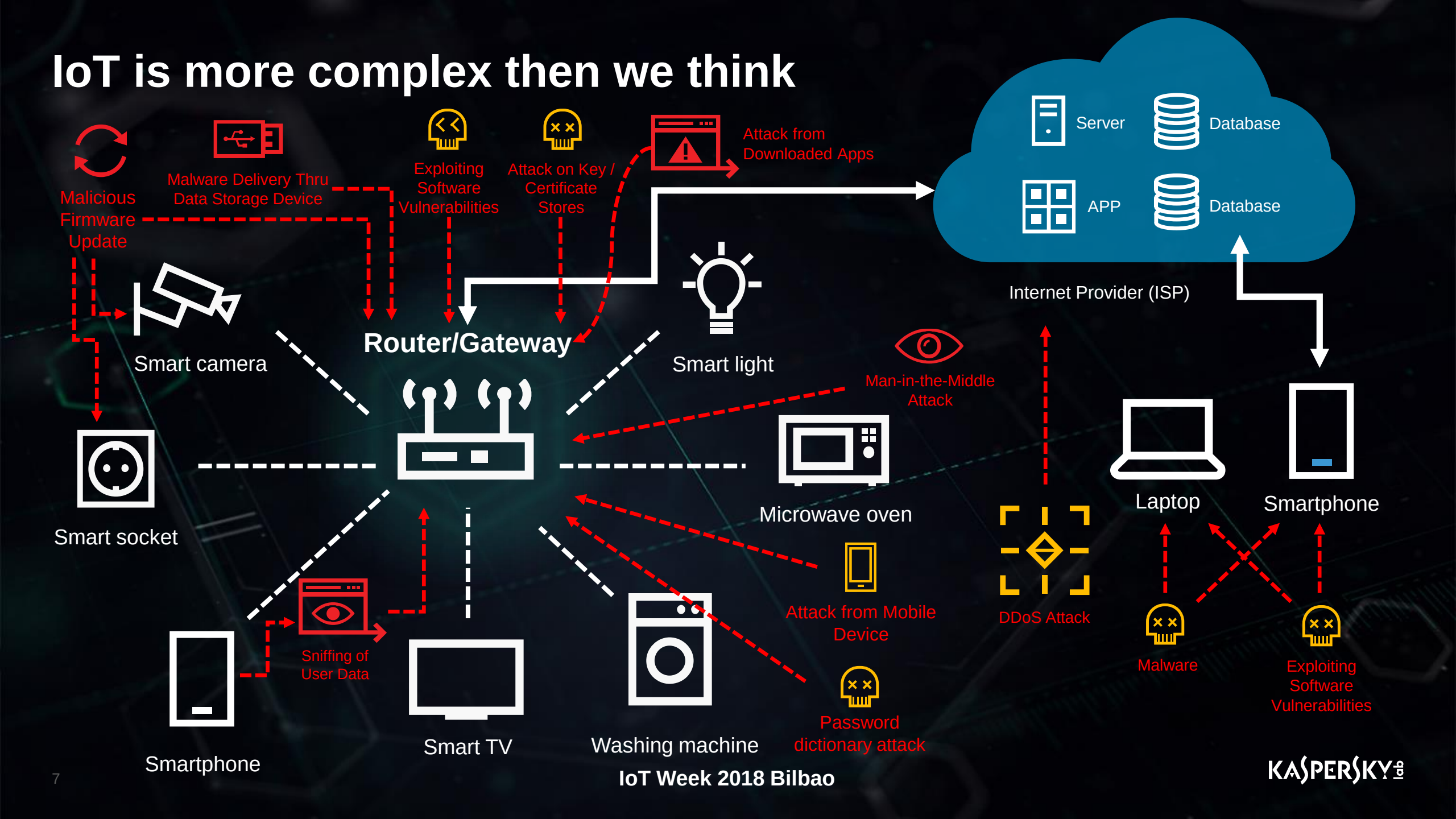
IoT is more complex then we think



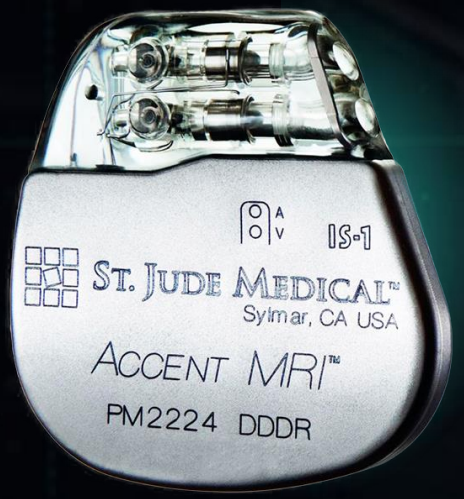
Attacks on safety

The manufacturer of "smart" locks Lockstate has managed to block the entrance doors to hundreds of its customers, releasing an unsuccessful firmware update.

After installing the problem update, the built-in keyboard did not work, so it was not possible to open the door.

Vulnerabilities in the "smart" security system of iSmartAlarm production. There are problems with SSL certificate authentication and access control, authentication errors, and a vulnerability that can cause a denial of service.

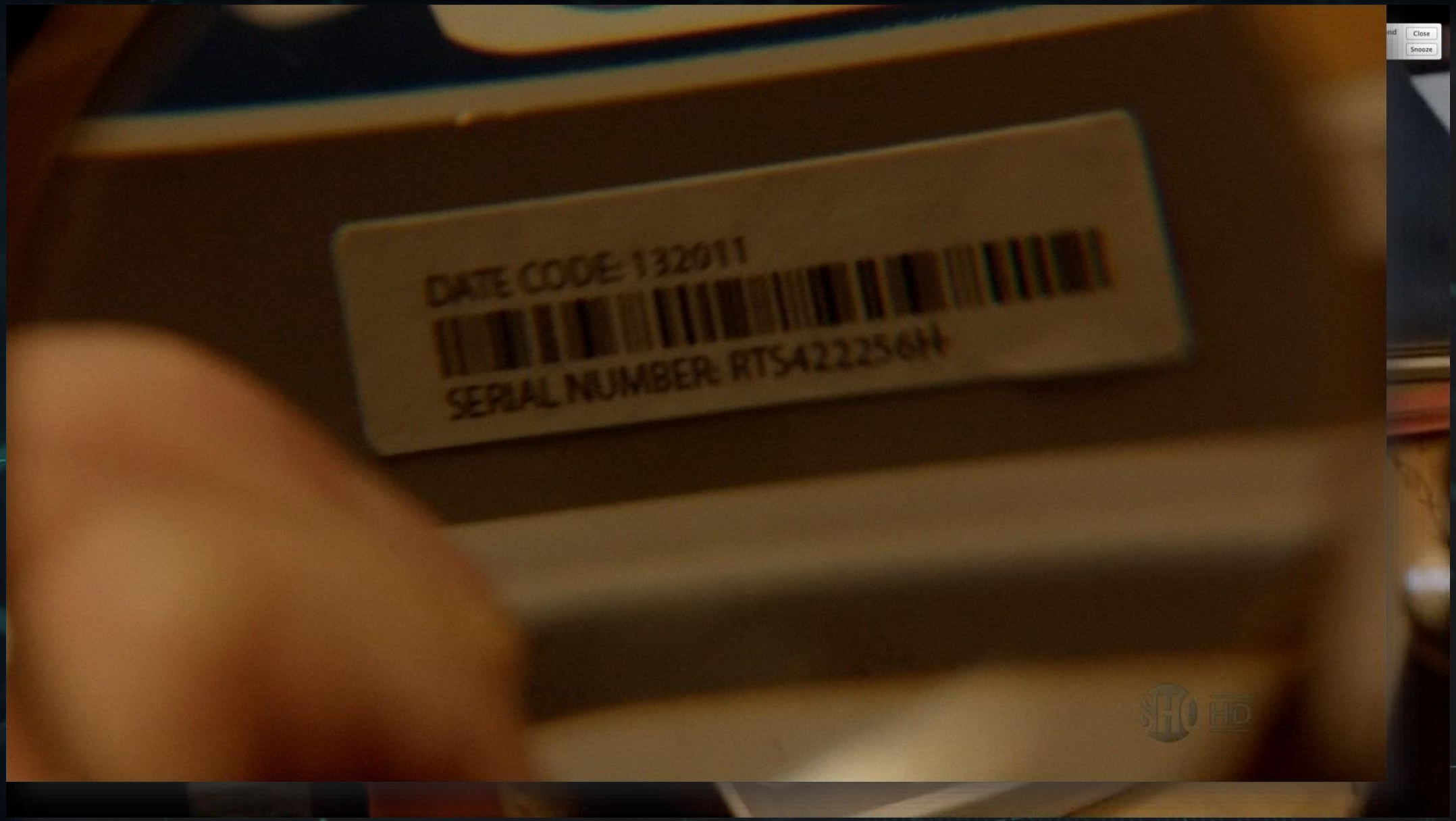
Attackers can exploit vulnerabilities in order to disable signaling and, for example, rob a house.



The Food and Drug Administration announced the recall of some models of pacemakers produced by Abbott.

The reason for the recall was the vulnerabilities discovered in the devices that allow attackers to gain control over the device. In particular, a hacker can reduce the battery power of the device or accelerate the heartbeat.

https://www.securitylab.ru/news/487795.php



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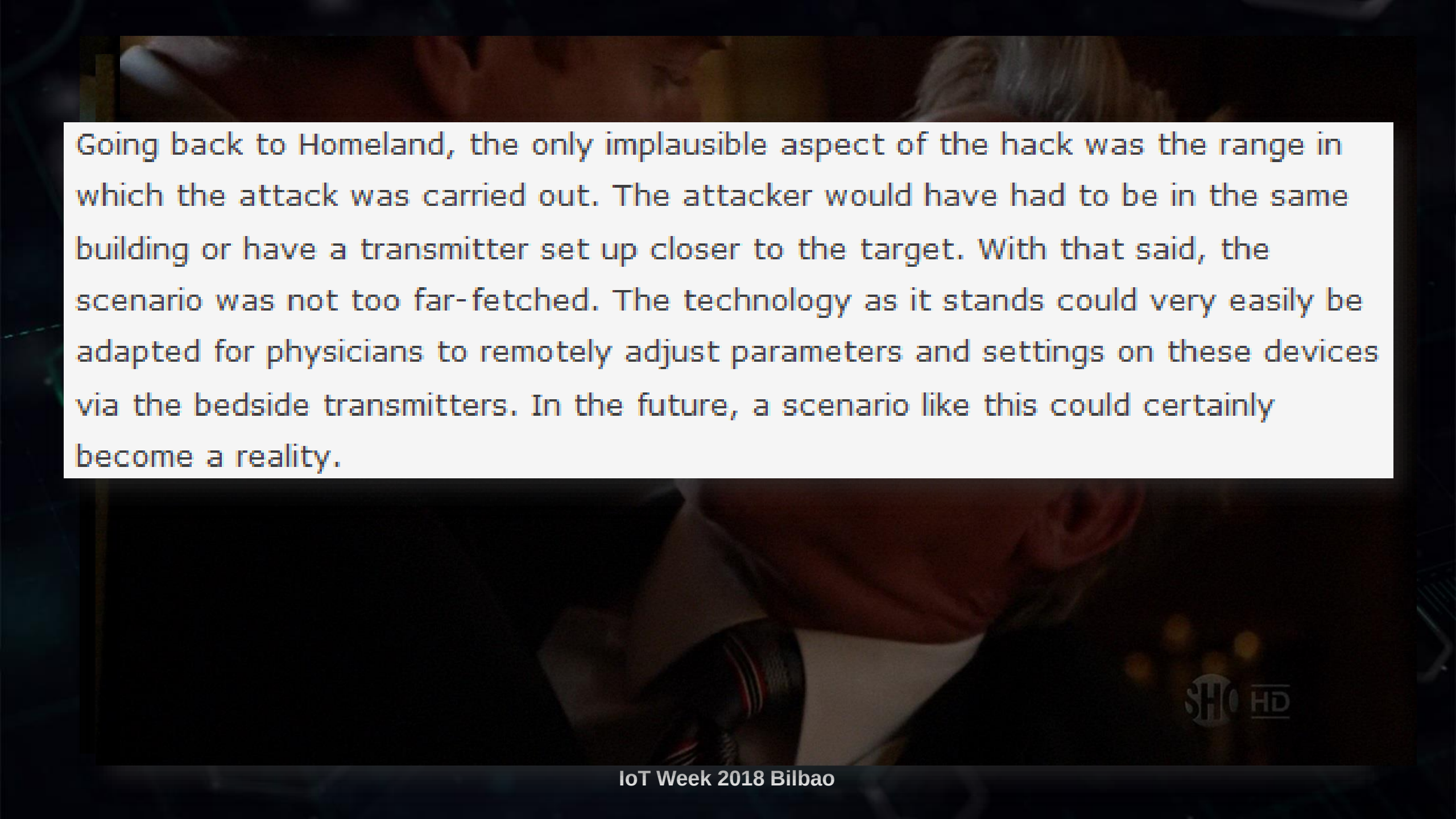
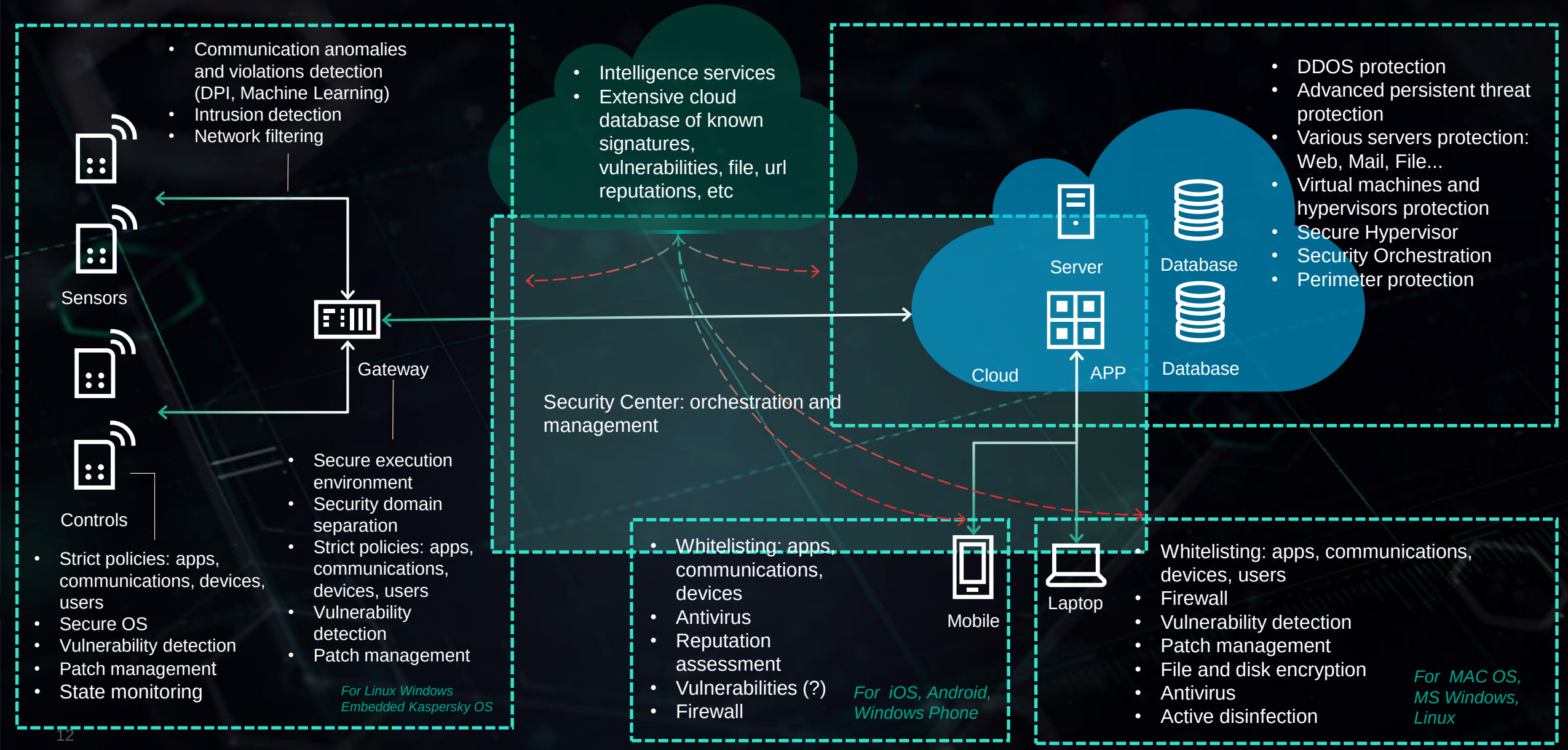

Going back to Homeland, the only implausible aspect of the hack was the range in which the attack was carried out. The attacker would have had to be in the same building or have a transmitter set up closer to the target. With that said, the scenario was not too far-fetched. The technology as it stands could very easily be adapted for physicians to remotely adjust parameters and settings on these devices via the bedside transmitters. In the future, a scenario like this could certainly become a reality.
SHO HD

What to do?

Kaspersky Lab. Security Capabilities



True IoT Security

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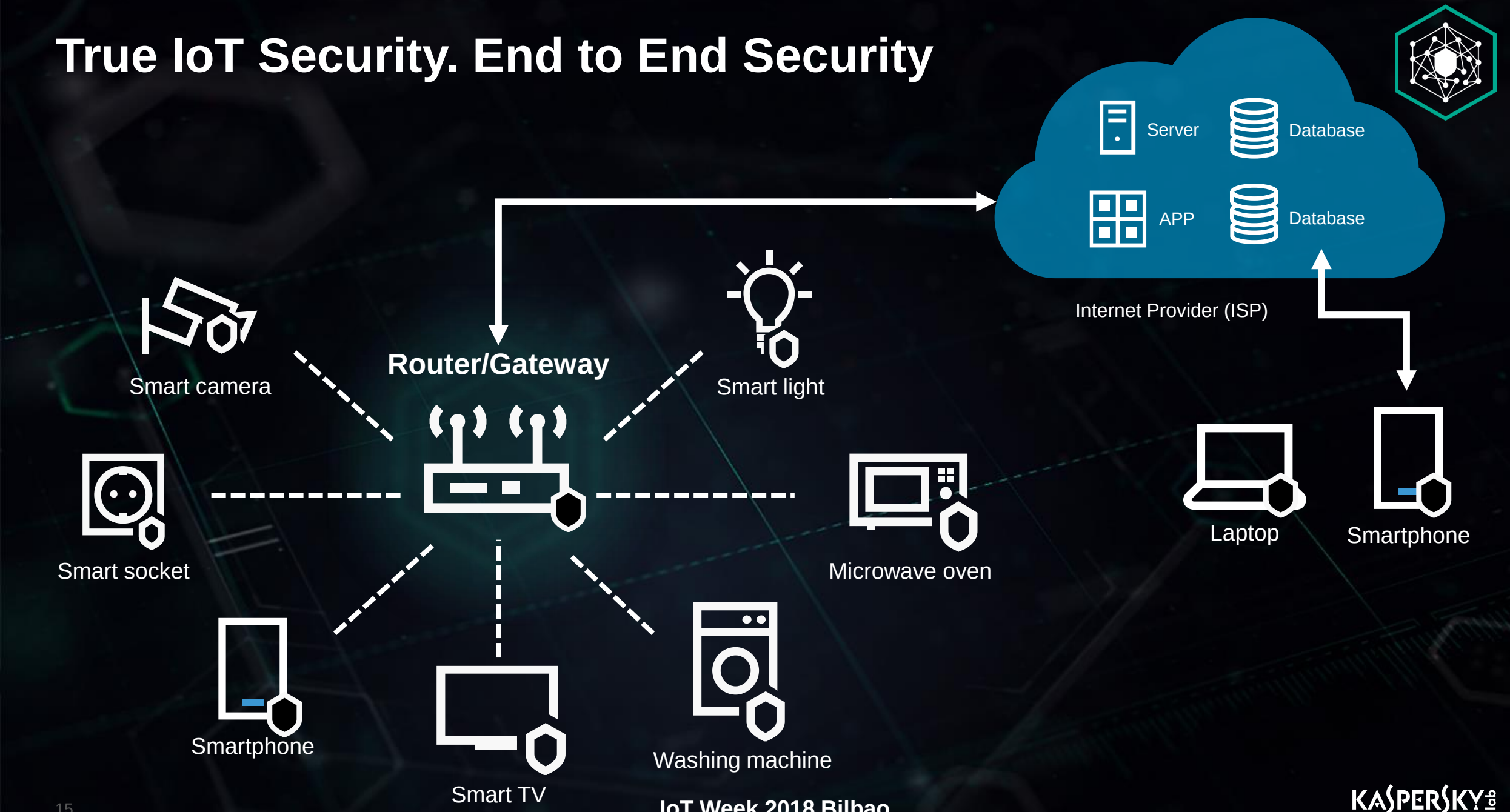
True IoT Security. Main principles

- End to End Security
- Root of Trust
- Device Hardening
- Security for Safety

True IoT Security. End to End Security



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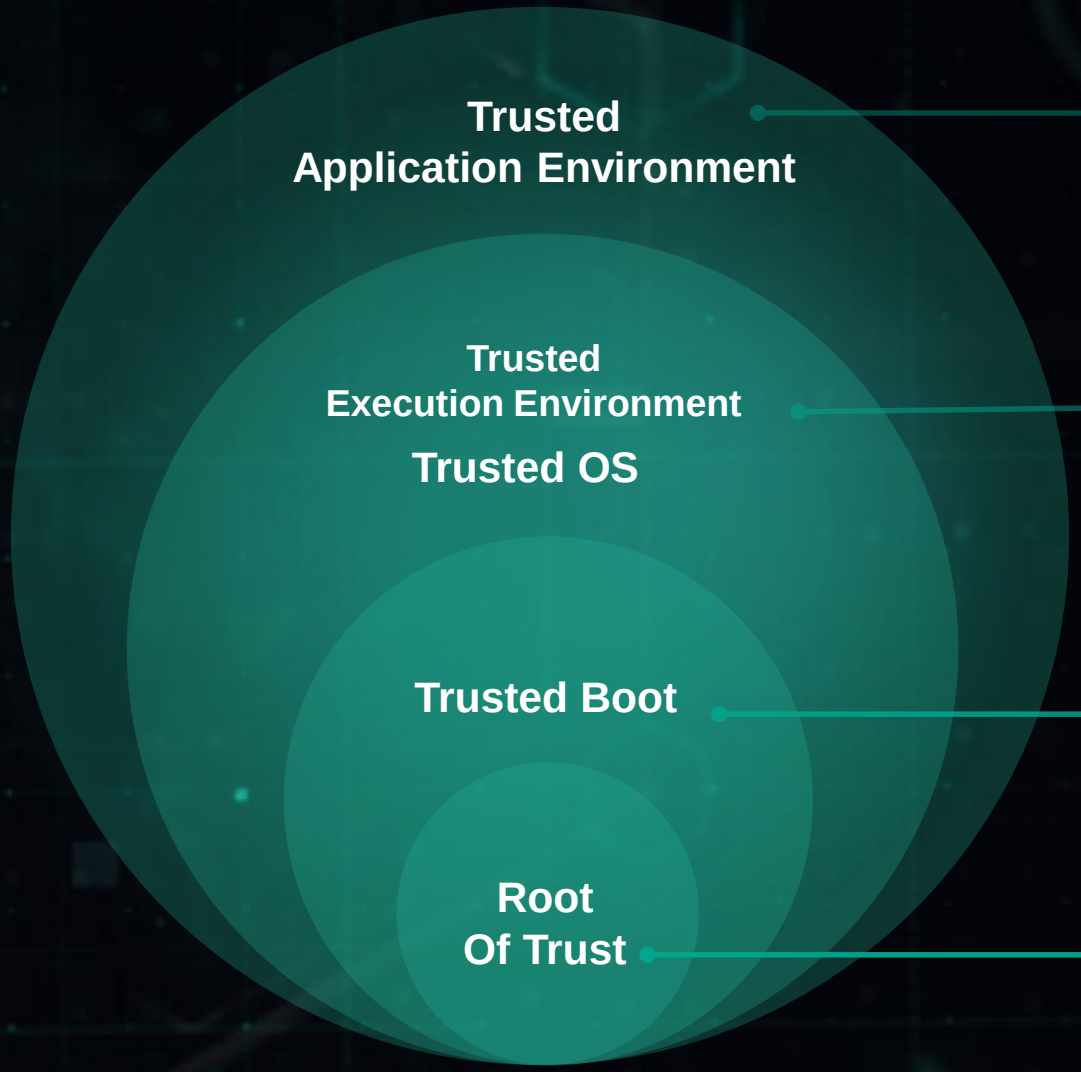
True IoT Security. Root of Trust



Trusted user environment
Overlay security applications
Application security

Trusted system environment
Administration, Security domains
System security, Hardware Virtualisation

Trusted boot, firmware update
Software virtualisation

Trusted hardware kernel
Trusted memory space
Keys/certificate storage

True IoT Security. Device Hardening

From Security Gateway

To Secure Gateway

True IoT Security. Security for Safety

- IoT is cyber-physical system.
- IoT cyber threats are not only for data anymore but also for health, physical objects, environment. It is a safety issue.
- Successful cyber attacks on IoT mean physical damage.
- Providing Cyber security for IoT means maintaining of safety.

Kaspersky®
IoT Security

We believe that Internet of Things will bring a lot of benefits for all of us.

With True IoT Security we can help to create safe and secure IoT

Ooops, your files have been encrypted!
What Happened to My Computer?
Can I Recover My Files?
How Do I Pay?
Payment will be raised on
Your files will be lost on
Time Left
bitcoin
Check Payment
Decrypt
WEI DEFROST
JET DEFROST
POWER
CLOCK
GREE
开/关
风速
制冷
制热
上下扫风
左右扫风

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