

#AtosTechDays

Brussels - July 4, 2017

Security --- at the heart

Thierry Breton,
Atos Chairman & CEO

Atos



4500
SECURITY
PROFESSIONALS

14
SECURITY
OPERATIONS
CENTERS
IN THE WORLD

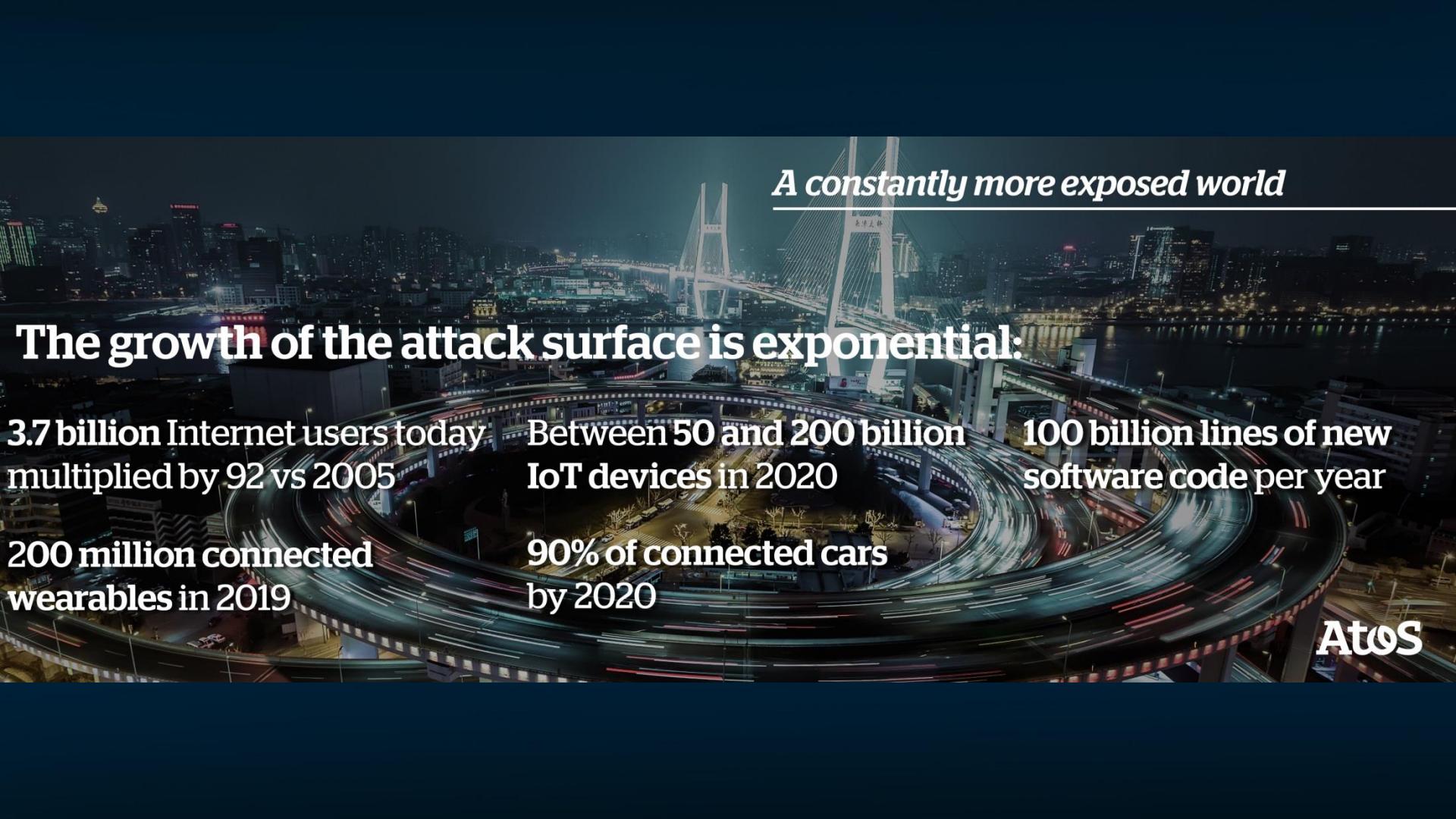
Atos, the European leader in data protection

100 MILLION
SECURITY EVENTS
MANAGED EACH HOUR

Nº1 in Europe*

Atos

*Nelson Hall 2017



A constantly more exposed world

The growth of the attack surface is exponential:

3.7 billion Internet users today
multiplied by 92 vs 2005

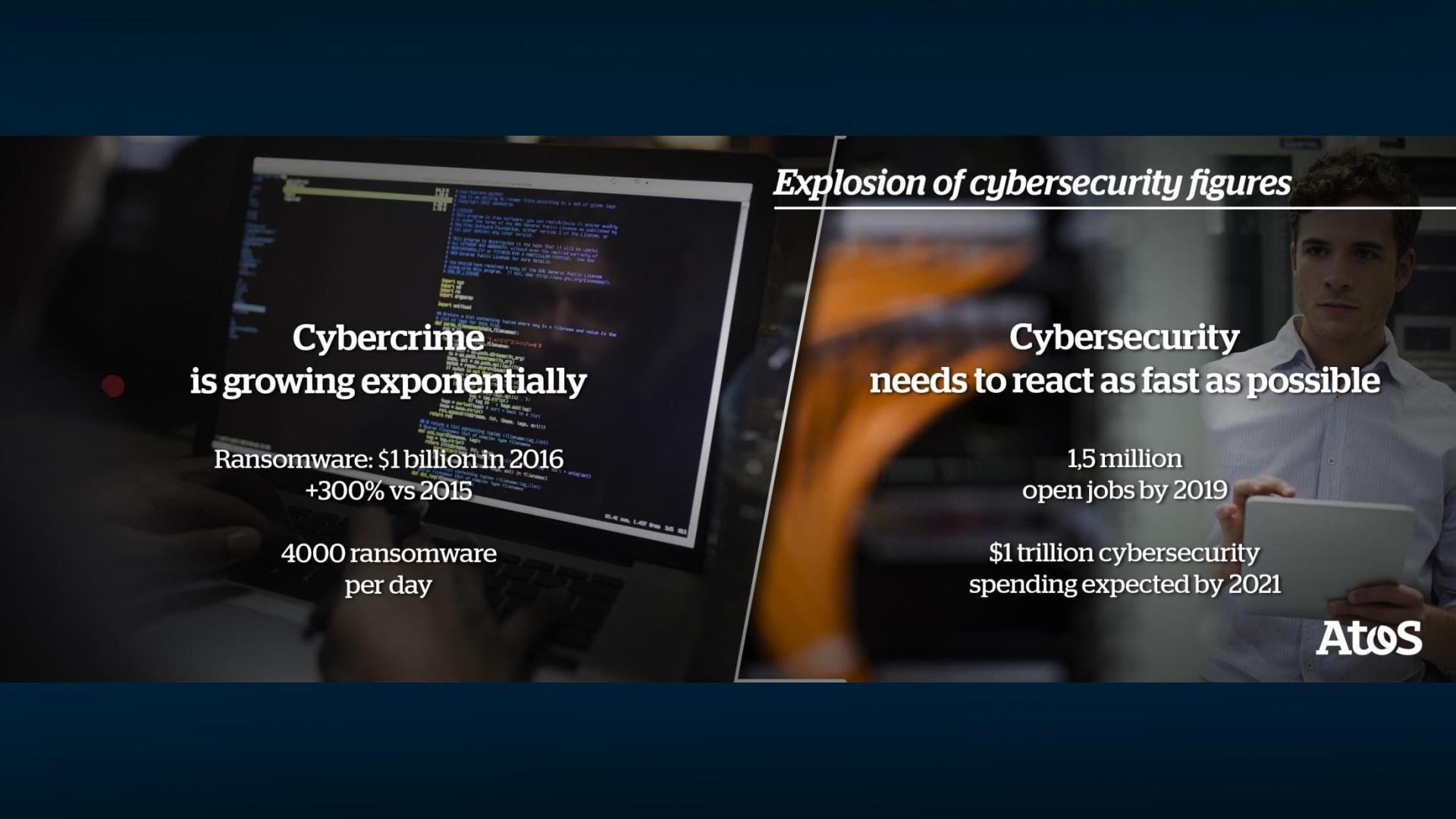
**200 million connected
wearables** in 2019

**Between 50 and 200 billion
IoT devices** in 2020

90% of connected cars
by 2020

**100 billion lines of new
software code** per year

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Cybercrime is growing exponentially

Ransomware: \$1 billion in 2016
+300% vs 2015

4000 ransomware
per day

Explosion of cybersecurity figures

Cybersecurity needs to react as fast as possible

1,5 million
open jobs by 2019

\$1 trillion cybersecurity
spending expected by 2021

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DATA THEFT

Attempts to
data confidentiality

DENIAL OF SERVICE

Attempts to
data availability

The various faces of cyber attacks

PHYSICAL DESTRUCTION

Attempts to
safety and integrity

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3 types of vectors: virus, worms, botnets

VIRUS

Targeted or massive
Infected through attachment in a mail, websites, applications, usb key

WORMS

More massive than targeted

Propagating through vulnerabilities in OS

BOTNETS

Group of computers or IoT (zombies) under control of a control-command server

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More than
3 millions data
records are
compromised
every day

The background of this section is a composite image. On the left is a dark, blurred image of a stock market chart with candlesticks and data labels like '1.655' and 'SL/T'. In the center is a photograph of a man in a light blue shirt and tie standing on a ladder, reaching up to a high shelf in a library filled with books. On the right is the Atos logo, which consists of the word 'Atos' in a bold, white, sans-serif font.

Tremendous impacts of Cyber Attacks

Cyber crime costs quadrupled from 2013 to 2015, projected to reach \$2 trillion by 2019

Global brand trust affected

General Data Protection Regulation



A leading example of cybersecurity challenge: the Rio Olympic Games

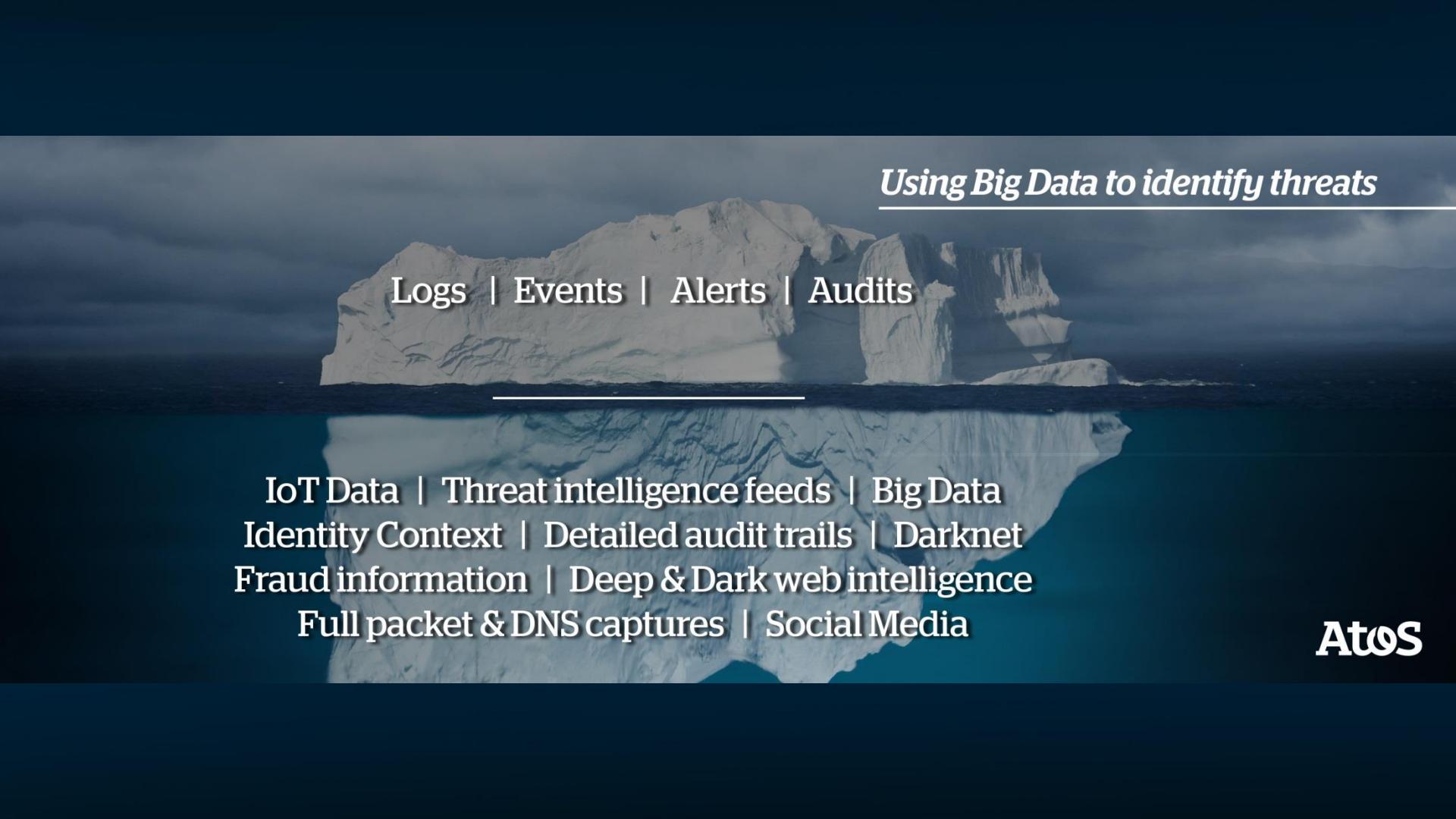
**500
million**
Security events

23,000
Significant events
processed by the
Technical Operation
Center

20
Critical events
stopped

0
Incident
impacted
the live
competition

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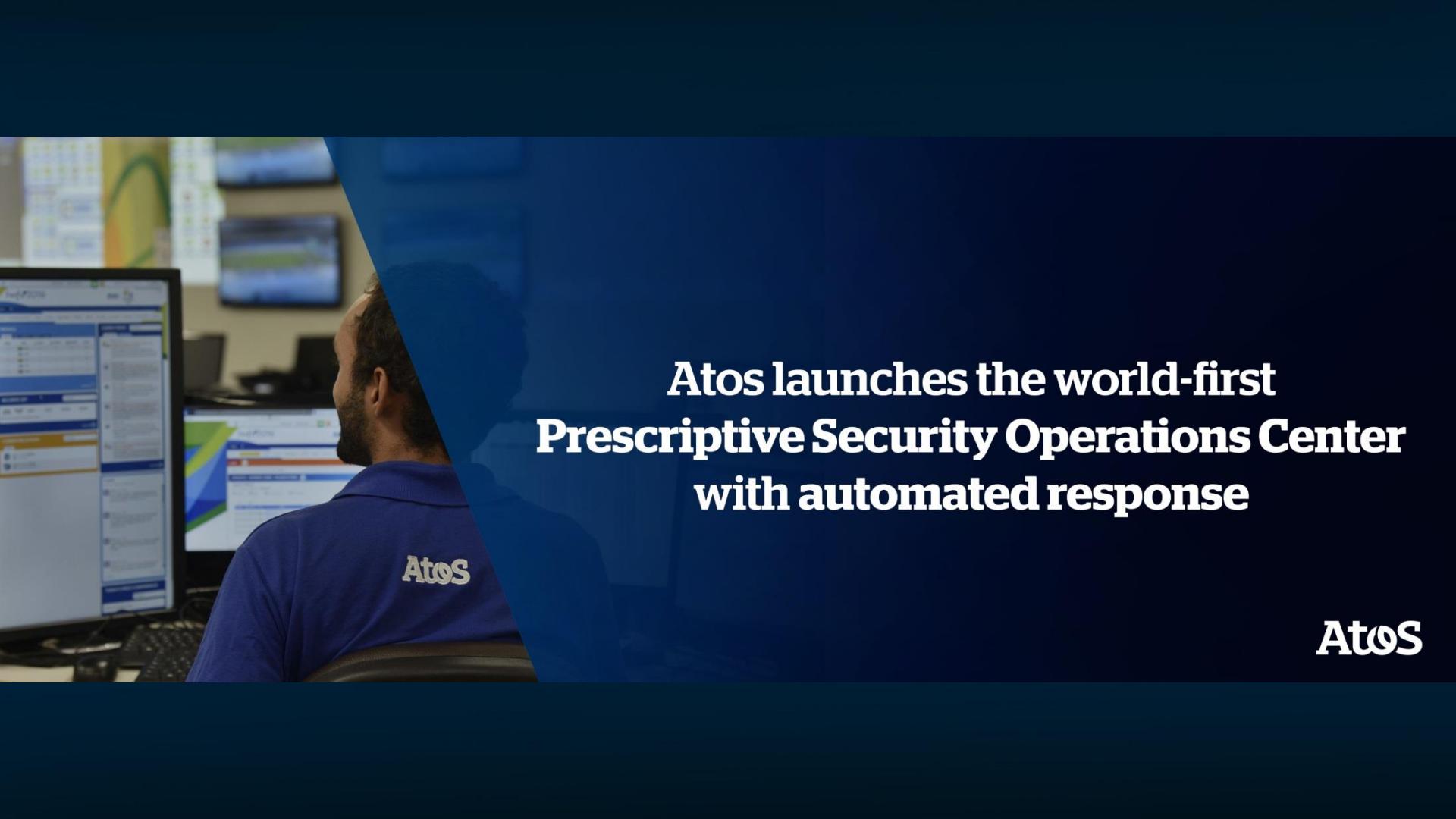


Using Big Data to identify threats

Logs | Events | Alerts | Audits

IoT Data | Threat intelligence feeds | Big Data
Identity Context | Detailed audit trails | Darknet
Fraud information | Deep & Dark web intelligence
Full packet & DNS captures | Social Media

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A photograph showing the back of a man wearing a blue polo shirt with the "Atos" logo on the shoulder. He is seated at a desk in what appears to be a control room or monitoring center, looking at multiple computer screens displaying various data and graphs.

**Atos launches the world-first
Prescriptive Security Operations Center
with automated response**

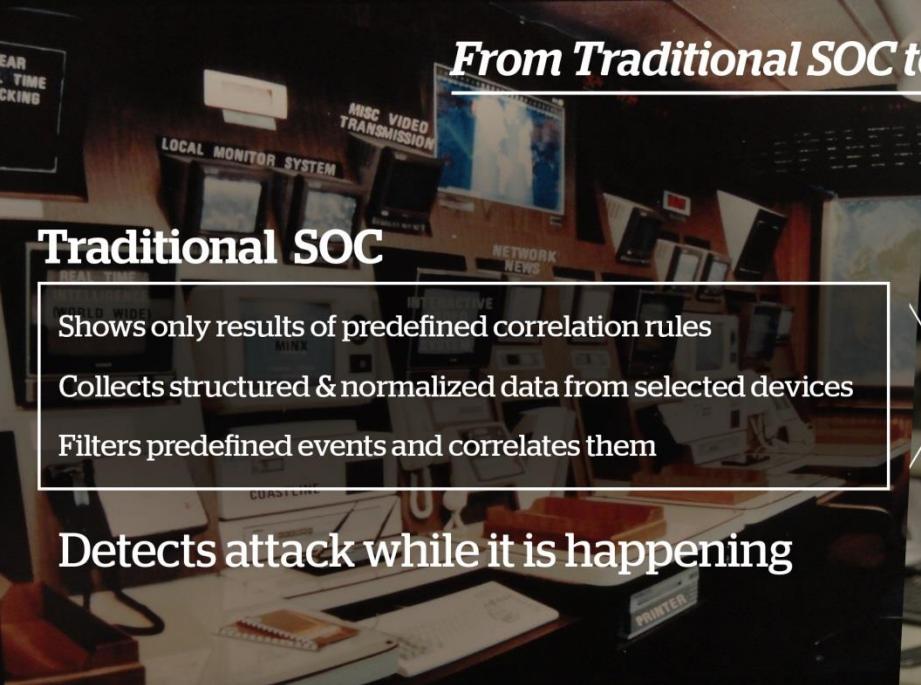
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From Traditional SOC to Advanced Security Operation Center (SOC)

Traditional SOC

- Shows only results of predefined correlation rules
- Collects structured & normalized data from selected devices
- Filters predefined events and correlates them

Detects attack while it is happening



NSOC watch floor circa 1985

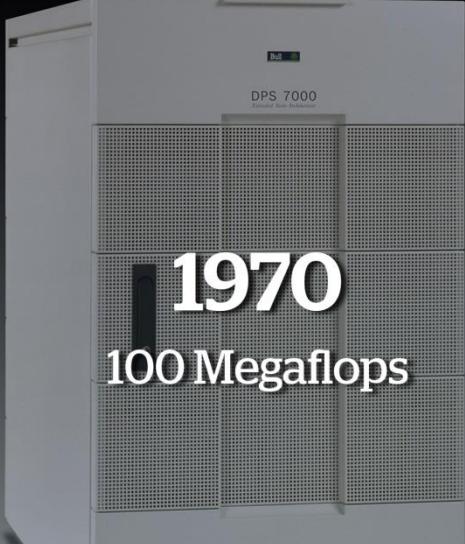
Prescriptive SOC

- Retrieves information across Data Lakes
- Unstructured Intelligence (Social Media, Dark Web, Deep web)
- Derives behavior pattern as baseline to detect deviation

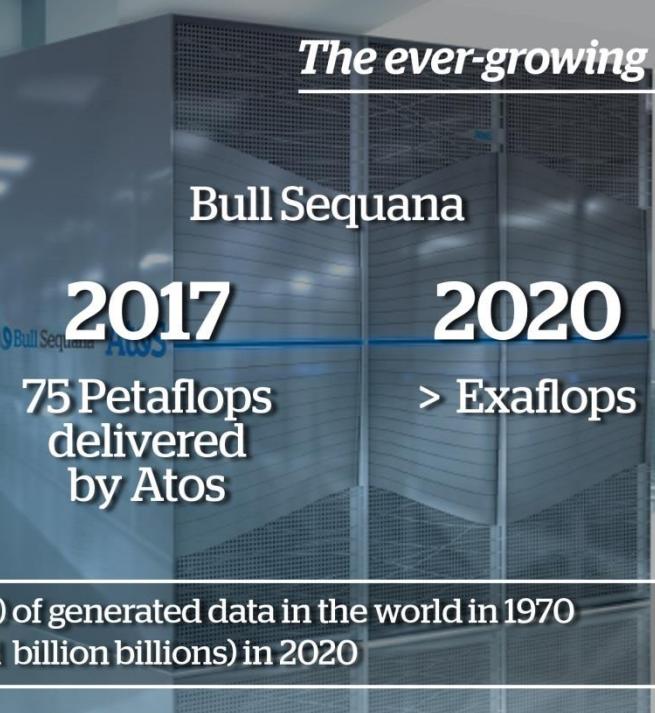
Detects upcoming attacks & automate response to neutralize it



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1970
100 Megaflops



2017
75 Petaflops
delivered
by Atos

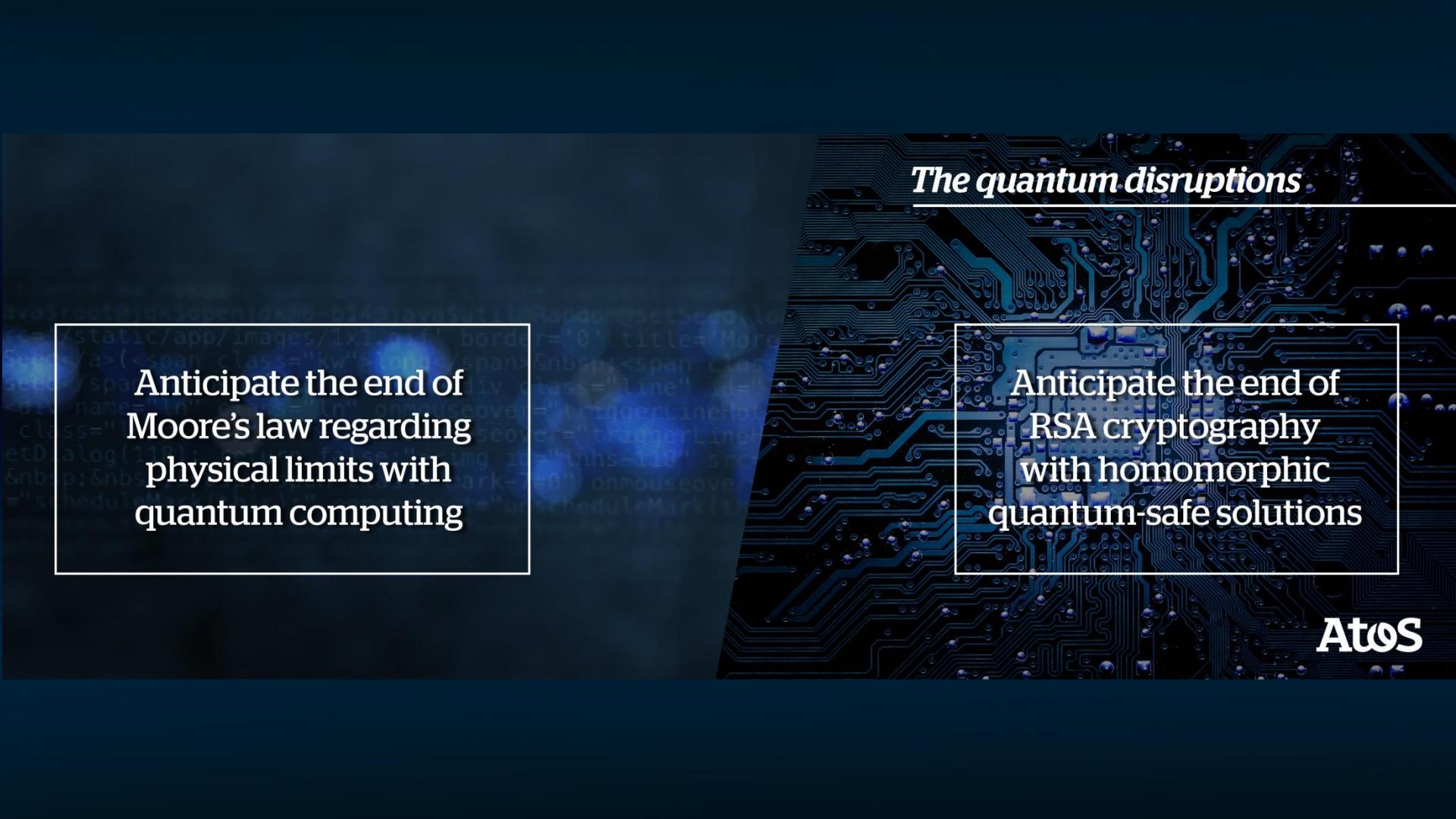
2020
> Exaflops

From 40 petabytes (40 billion) of generated data in the world in 1970
to 40 zettabytes (40 thousand billion billions) in 2020

The ever-growing need of computing power

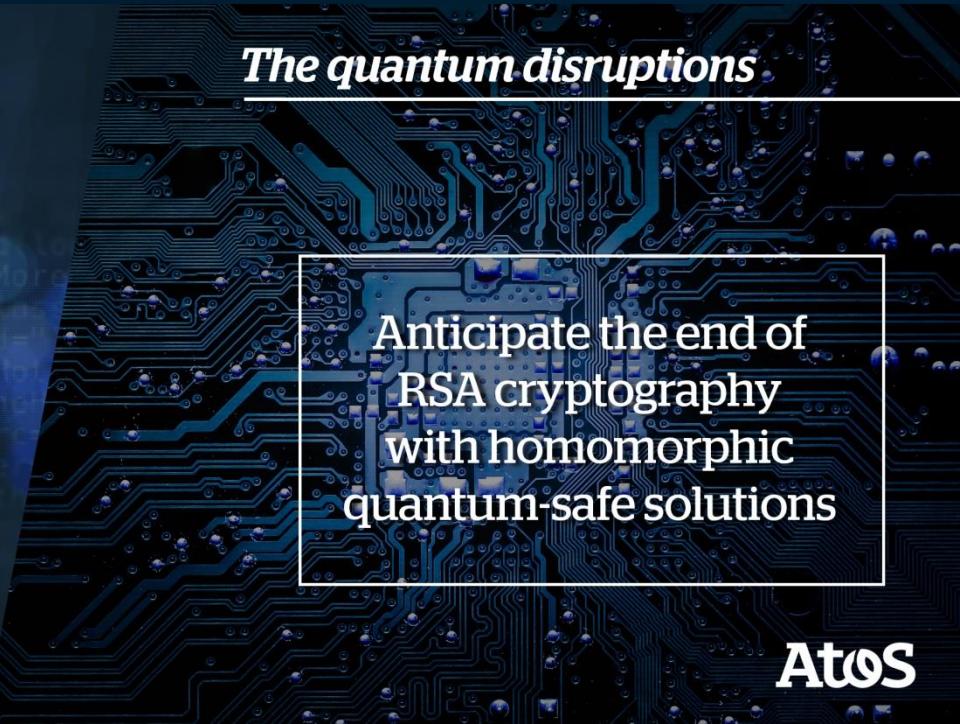
**What's
next**

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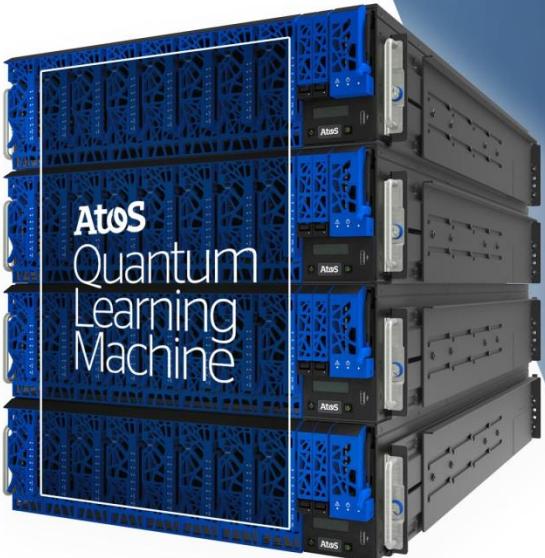
Anticipate the end of
Moore's law regarding
physical limits with
quantum computing

The quantum disruptions



Anticipate the end of
RSA cryptography
with homomorphic
quantum-safe solutions

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**Atos launches and markets
the most powerful quantum simulator
in the world**

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```
1  DEFINE GATE qft2 = QFT[2]
2    DEFINE GATE qft10 = QFT[5]
3      BEGIN
4        qubits 3
5        QFT q[0],q[1],q[2]
6        H q[0]
7          S q[1]
8          T q[2]
9        CNOT q[0],q[1]
10       GATE ex q[1]
11       X q[2]
12     CNOT q[1],q[2]
13     IQFT q[0],q[1],q[2]
14     DAG(CTRL(RX[PI/2])) q[2],q[0]
15   DEFINE GATE qft2 = QFT[2]
16   DEFINE GATE qft10 = QFT[5]
17     BEGIN
18       qubits 3
19       QFT q[0],q[1],q[2]
20       H q[0]
21       S q[1]
22       T q[2]
23       CNOT q[0],q[1]
24       GATE ex q[1]
25       X q[2]
26       CNOT q[1],q[2]
27     IQFT q[0],q[1],q[2]
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29   DEFINE GATE qft2 = QFT[2]
30   DEFINE GATE qft10 = QFT[5]
31 BEGIN
32   qubits 3
33   QFT q[0],q[1],q[2]
34   H q[0]
```

Developing quantum applications today

Immediate development of quantum software, training, and experimentation.

Simulation of a quantum computer with the execution of a “classic” computer.

Much superior simulation capabilities than any other affordable appliance.

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Atos Quantum Program

**Quantum Programming
Platform**

**Next Generation
Architectures**

Quantum Algorithms

**Quantum-safe
cryptography**

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Security at the heart

Philippe Vannier,
Atos group advisor for technology
Chairman of the European cybersecurity organization

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Atos Technology Days: Strengthening Technology Leadership

May 31
Atos Quantum
World-renowned
Scientific Council

June 19
Atos includes ARM
processors with new
Bull Sequana X1310

July 3
UK Ministry of Defense
selects Bull Sequana
to support research

June 15
Atos to provide
GENCI with one
of the most
powerful
supercomputers
in the world

June 23
Hoox for
Mission

July 4
Atos launches the most powerful
quantum simulator in the world

Atos launches world-first
prescriptive SOC with
automated response

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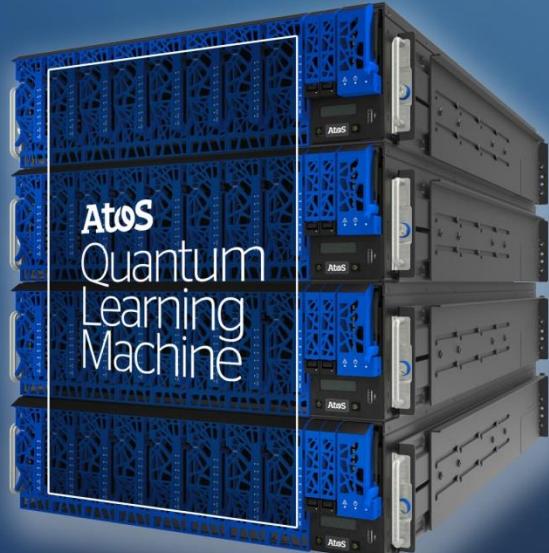


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Highlight Quantum Learning Machine



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Atos Quantum Learning Machine

A new ultra-compact supercomputer,
the same size of an enterprise server

Qubits in memory
speed up processing

Unique firmware
optimizing the data exchanges

Specific hardware components
to accelerate specific quantum calculations exchanges

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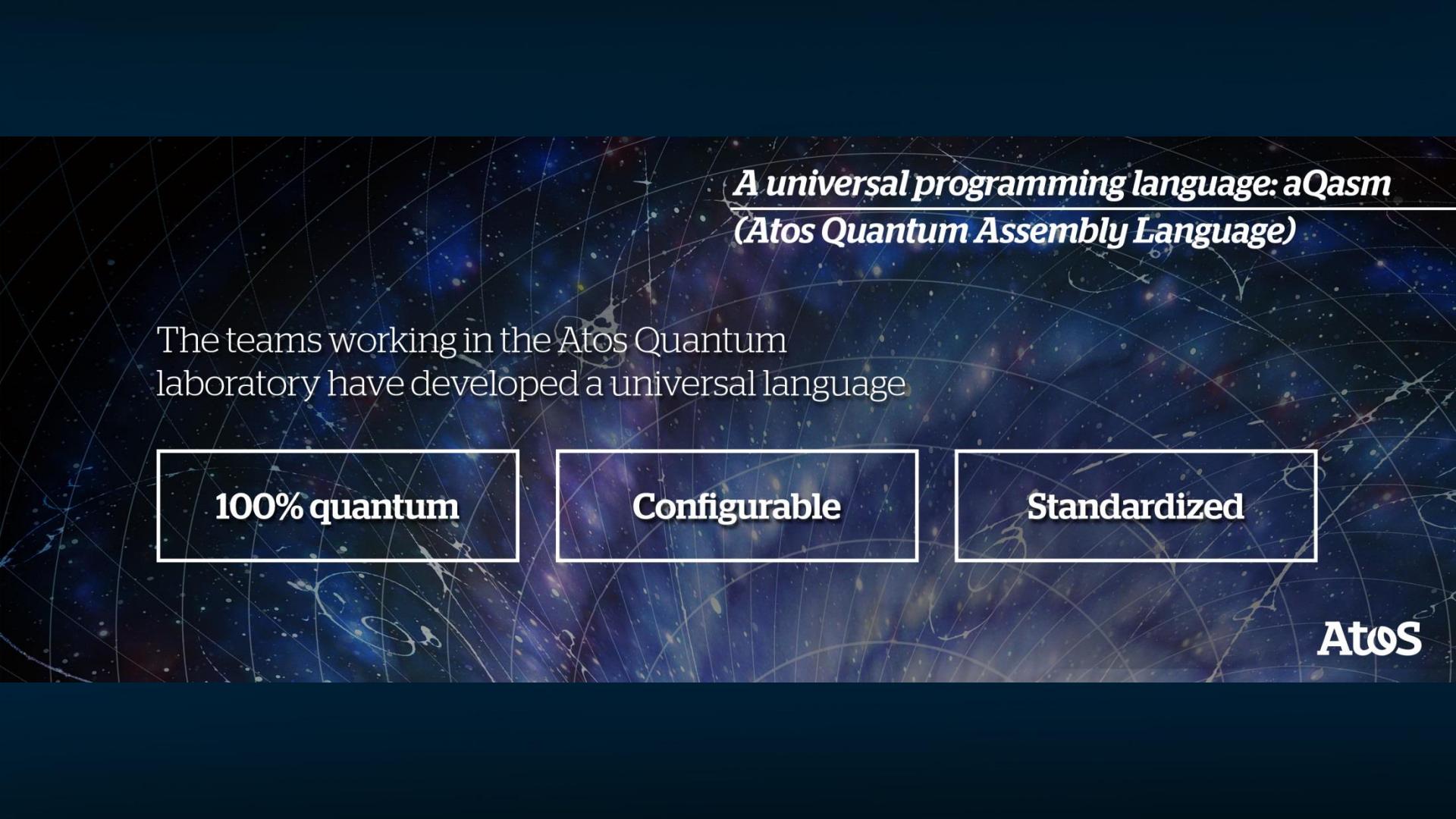
Atos Quantum Learning Machine

The Atos QLM is a complete appliance:

- A specific hardware infrastructure, with large in-memory capacity
- An extensible quantum circuit model
- An universal quantum assembly programming language: Atos Quantum Assembly Language (aka aQasm)
- A high-level quantum hybrid language, built on top of the popular Python language



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A universal programming language: aQasm (Atos Quantum Assembly Language)

The teams working in the Atos Quantum laboratory have developed a universal language

100% quantum

Configurable

Standardized

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Cybersecurity Highlights

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Prescriptive Security Analytics

Atos Prescriptive SOC

Intelligence Drive Cyber Security Detection & Response

Threat
Intelligence

Artificial
Intelligence &
Machine Learning

Automation &
Orchestration

Big Data
Capabilities

14 Security
Operation
Centers
worldwide

Codex for
Security

Improved
Detection &
Response
Time

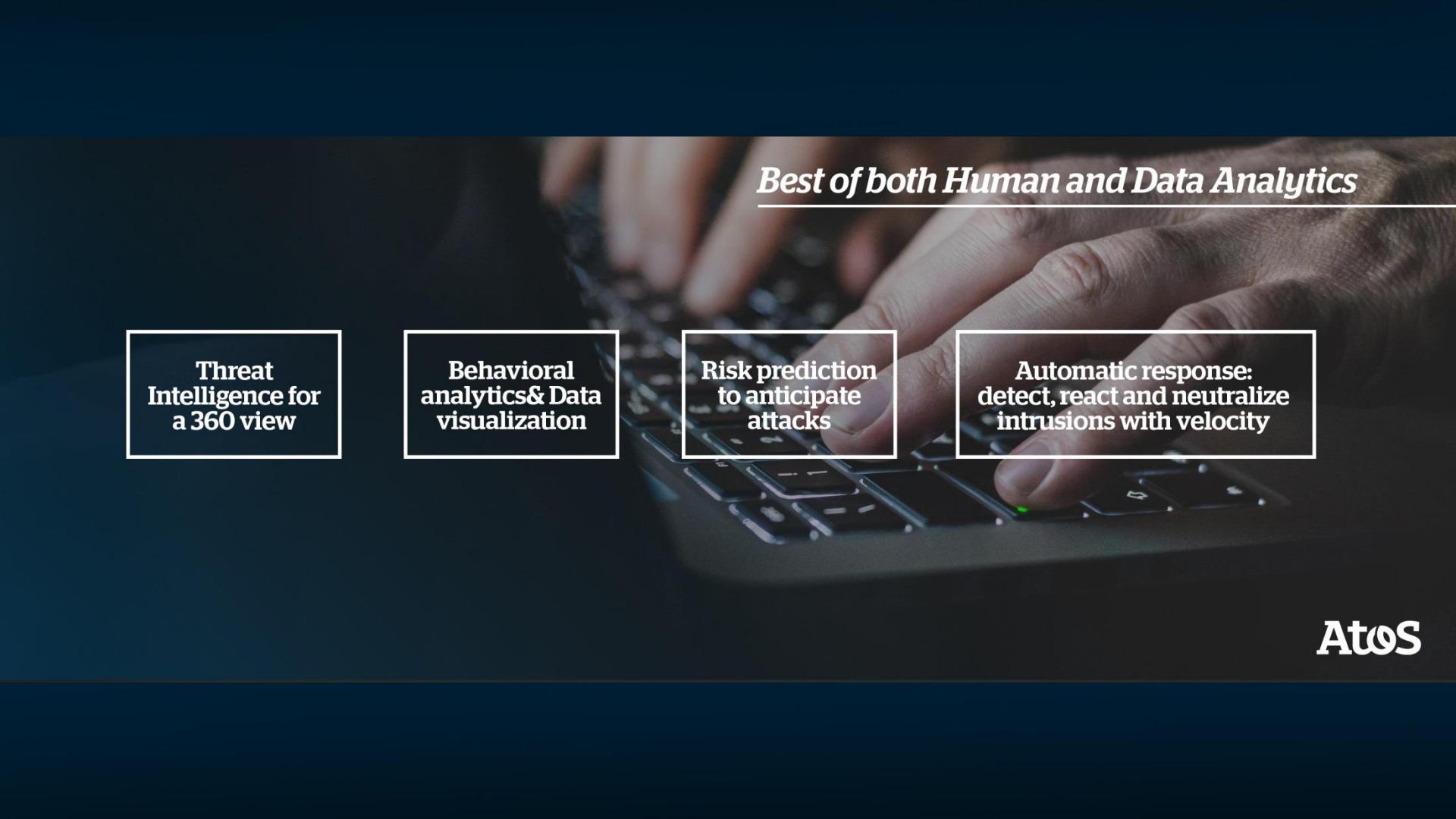
Leverage Atos own
R&D in AI/
Machine Learning

Monitor IT, OT &
IoT environments
360° Security View

Powered by Bullion

- Big Data Capabilities
- Scalability
- Machine Learning
- Data visualization
- One Platform for all services

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A close-up photograph of a person's hands typing on a dark computer keyboard. The hands are positioned in the center, with fingers pressing keys. The background is dark, and the lighting highlights the hands and the keyboard.

Best of both Human and Data Analytics

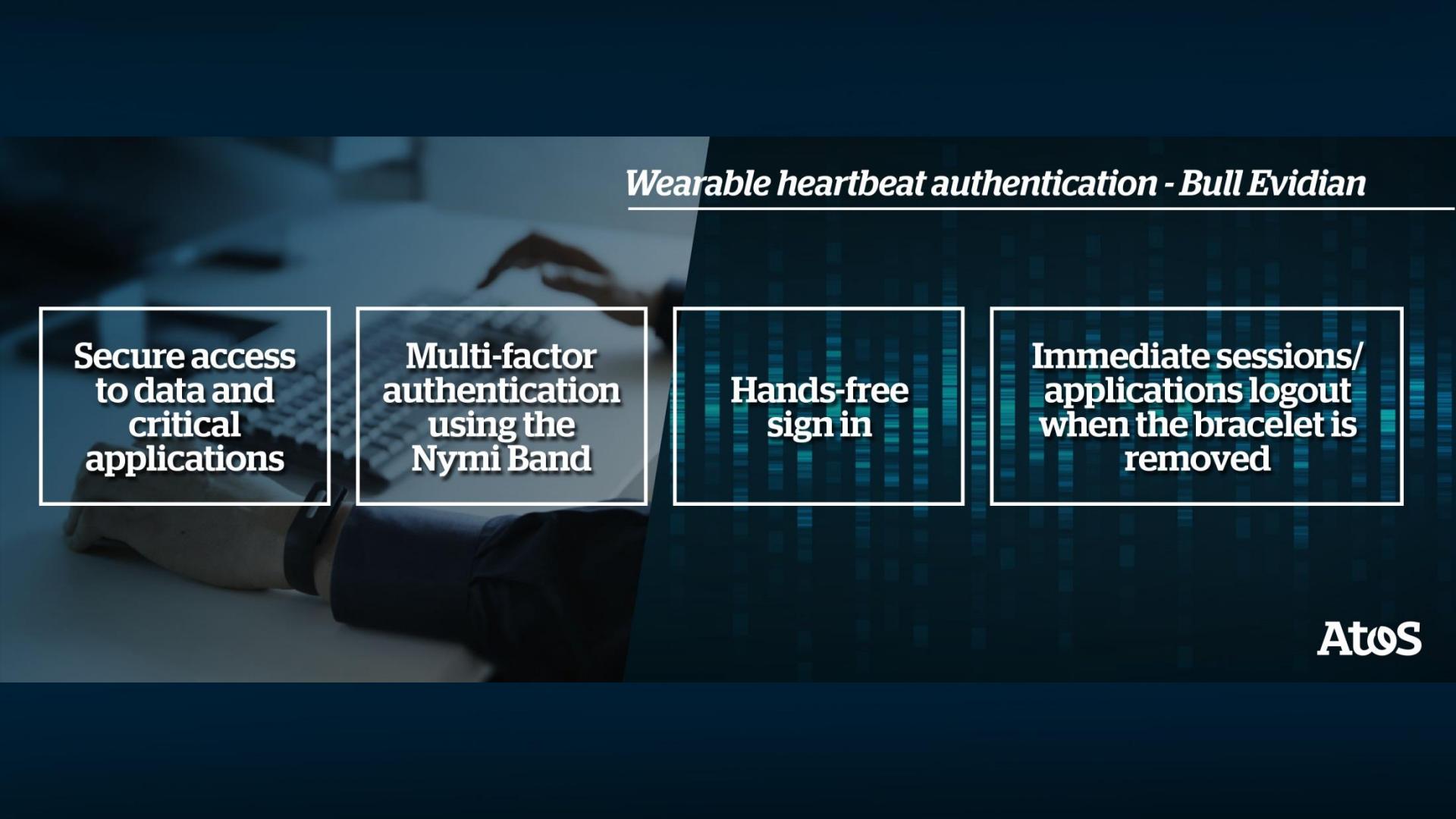
Threat
Intelligence for
a 360 view

Behavioral
analytics & Data
visualization

Risk prediction
to anticipate
attacks

Automatic response:
detect, react and neutralize
intrusions with velocity

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Wearable heartbeat authentication - Bull Evidian

**Secure access
to data and
critical
applications**

**Multi-factor
authentication
using the
Nymi Band**

**Hands-free
sign in**

**Immediate sessions/
applications logout
when the bracelet is
removed**



IoT Security - Bull Horus

**Protect IoT
deployments by adding
“security by design”**

**Secure data in transit
from the IoT to the
systems**

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Defense Security Solutions

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Atos Defense Security footprint



Tactical Communications

Linking mission teams securely

Combat Management

Sharing tactical situation on the battlefield

Industrial Solutions

Enhancing readiness of combat platforms

Intelligence & Reconnaissance

Providing intelligence for combat missions

Cyber Security

Securing strategic assets & organizations

Support & Back Office Missions

Designing, building and running global support & back office information systems

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4G / LTE advantages

- Use data-intensive mission information (photos, map, videos ...)
- Share the tactical situation in reflex time
- Best-of-breed for handheld device



Critical communication features

- Resilience of communications
- Security of communications
- Critical user features (push-to-talk, blue force tracking)

Tactical Communications

Securing intervention forces: Hoox for mission

Hoox for mission
critical communications



Hoox Smartphone

Ultra-secure Android phone with mission-oriented user interface

Hoox Hub

Carry-on module switches transparently to appropriate communication: public LTE, private LTE, device-to-device

Hoox LTE Bubbles

Deploy local, secure private LTE communication

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End-to-end cybersecurity capabilities

Atos Consulting
Security Risk Assessment
Audits & Penetration tests
Privacy
Regulation Compliance
Crisis Management
CyberInsurance



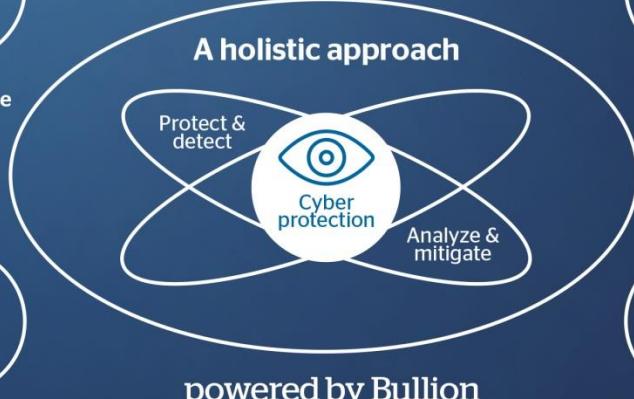
Security
Governance

Data Security
Bull Trustway

IoT security
Bull Horus



Secure
Communications



Situational
Awareness

Atos Prescriptive Operations Center
Cyber Emergency Response Teams
Managed Security Services



Digital Identity
& Access control

Identity & Access Management Solution Suite
Bull Evidian

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Security at the heart

Thierry Breton,
Atos Chairman & CEO

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Entanglement of quantum & cybersecurity

Cybersecurity

Quantum Homomorphic Encryption
Creating future proof security

2018+

Prescriptive Security
Eradicating nascent risks

2017

Predictive Security
Foreseeing the unexpected

2016

Bull Sequana
Pioneering Exascale

2016

Quantum learning machine
Empowering the future

2017

Machine intelligence
Fostering deep learning

2018+



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