

Unleashing the Power of AI and ML in the Cloud through a Pay-per-Use Business Model

Jin Zhang
VP of Marketing, Algodone

Algodone at a Glance

When/Where

Founded in 2015

HQ in
Montpellier,
France

Founders

Jérôme Rampon

Gaël Paul

Professor
Lionel Torres

Vision

Enabling
Silicon-as-a-
Service

Technology

Silicon
Activation
Licensing
Technology
(SALT)TM

Algodone Silicon-as-a-Service Portfolio

SALT Trace



Traceability
Verifiability

SALT Config



Flexible
Configuration

SALT Meter



Protection
Metering

Silicon Activation Licensing Technology (SALT™)

AI & ML Are the New Buzz Words

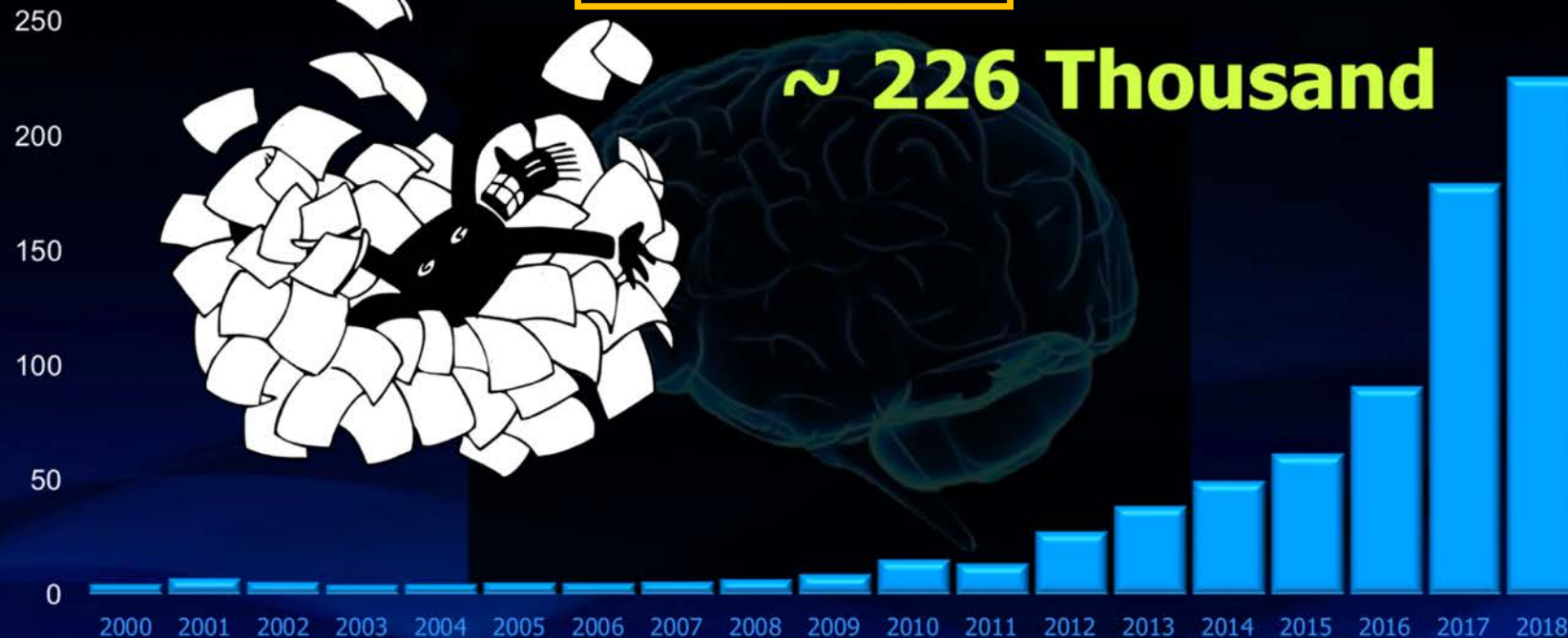
Artificial Intelligence & Machine Learning

In Comparison:

IoT 65,000

Cybersecurity 136,000

Number of Articles
(Thousands)



Source: Search conducted in Factiva

Wally Rhines, CEO, Mentor Graphics, GSA US Executive Summit

The Good News

Lots of Money and Opportunities in AI & ML

Startups Dominated by Domain-Specific Architectures

Worldwide Fabless Company Venture Capital Funding (Rounds 1-3)

Market Segments Funded 2012 – 2018 YTD By Funding Dollars (\$M)



Source: Global Semiconductor Alliance (GSA), VentureSource, PitchBook & Mentor Graphics Analysis

Wally Rhines, CEO, Mentor Graphics, GSA US Executive Summit

Challenges: How to Stand Out?

Is Technology Alone A Sufficient Differentiator?



Challenges: How to Justify ROI?



Technology node geometry / 13
Processing power x 50
Power efficiency x 17

Development Cost x 18
(\$35M at 65nm vs \$600M at 5nm)

Sources : press article, Moore or Less? - Accenture report 2017

ENABLING SILICON-AS-A-SERVICE

alqodone

Differentiate through Business Model Re-invent Silicon Monetization

Unleashing the Power of **AI and ML**
in the **Cloud**
through a **Pay-per-Use Business Model**

Today We Live in the Cloud



- Friends & family
- Work
- Information
- Resources
- Entertainment
- Pictures
- Apps
- Schedule
- ...

Cloud Delivers as-a-Service (aaS) Experience



Consumption
Based



On-demand
Fulfillment



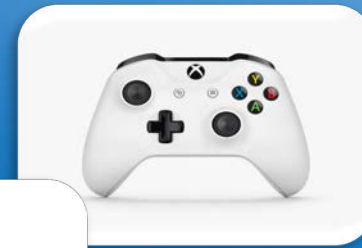
Anywhere,
Real-time



Personalized
Service



On-going
Value



Applications

Computer Vision/Disease Diagnosis/Autonomous Driving/Smart City /Robotics /Environment/Education

Framework



Infrastructure



Silicon: CPU, GPU, TPU, FPGA



Google: Leader in AI Chip Silicon-as-a-Service

Single Cloud TPU v3 (*beta*) device pricing



This is a beta release of Cloud TPU v3. This feature might be changed in backward-incompatible ways and is not subject to any SLA or deprecation policy.

The following table shows the pricing per region for using a single Cloud TPU v3 (*beta*) device.

US	EUROPE
Cloud TPU v3 (<i>beta</i>)	\$8.00 USD per TPU per hour.
Preemptible TPU v3 (<i>beta</i>)	\$2.40 USD per TPU per hour.

Silicon-as-a-Service Brings Huge Value (from ownership to usage)

	Google TPU v3	AWS F1
Device	Artificial Intelligence Processor Unit	Xilinx FPGA
Silicon Price (Estimated)	\$1,200	\$800
As-a-Service Revenue (3 years)	\$210,000 <i>(Source Google Price list)</i>	\$43,000 <i>(Source AWS Price list)</i>
Return on Investment	175x	54x

AI Applications: **Software as a Service**

Computer Vision/Disease Diagnosis/Autonomous Driving/Smart City /Robotics /Environment/Education

AI Framework: **Platform as a Service**



The Cloud: **Infrastructure as a Service**



CPU, GPU, TPU, DPU, FPGA: **Silicon as a Service**



Silicon-as-a-Service Requirements



Protection of
Shared IP

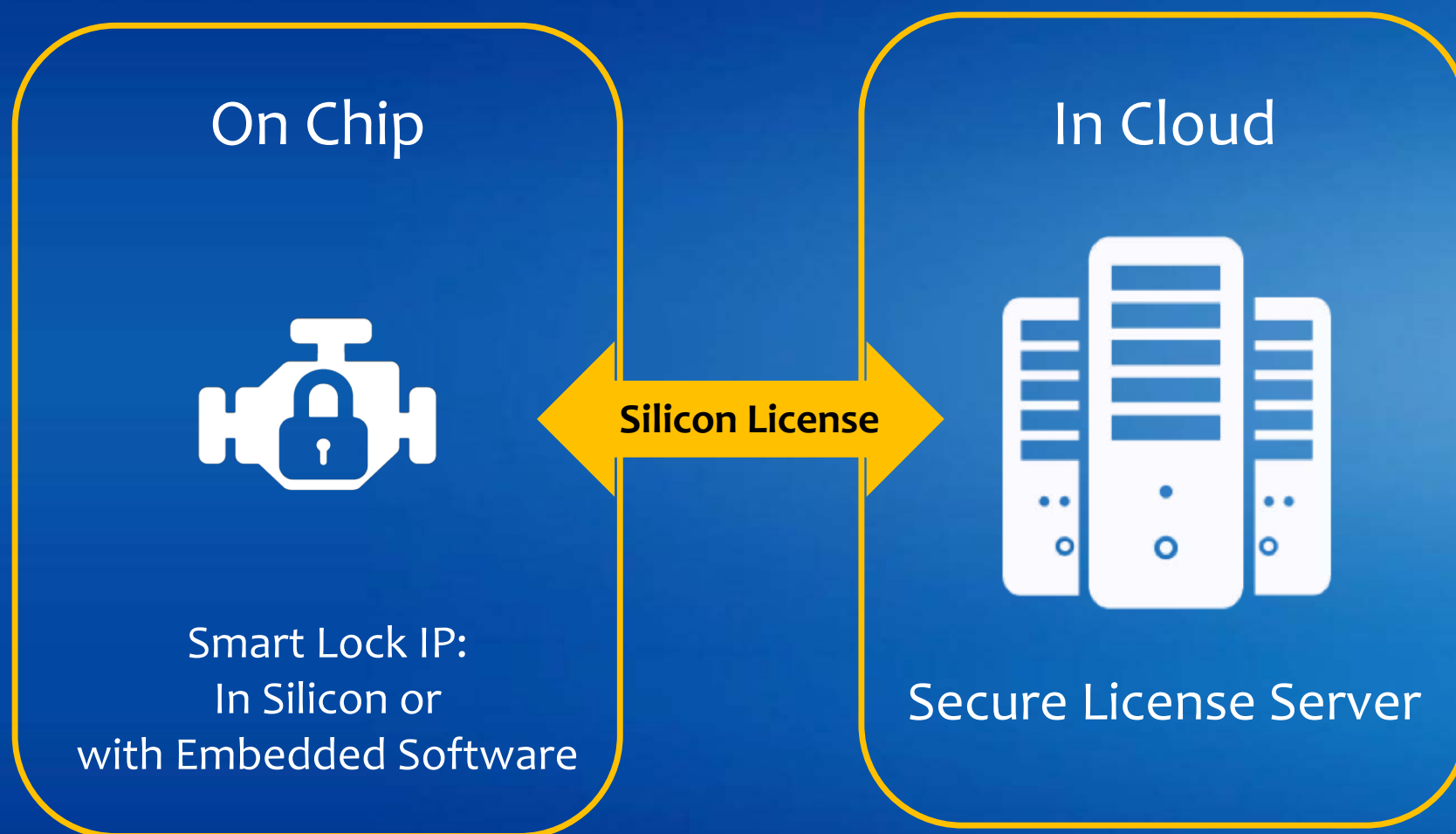


Pay-per-Use
Metering

Meter not simply on
time, but all metrics,
such as:

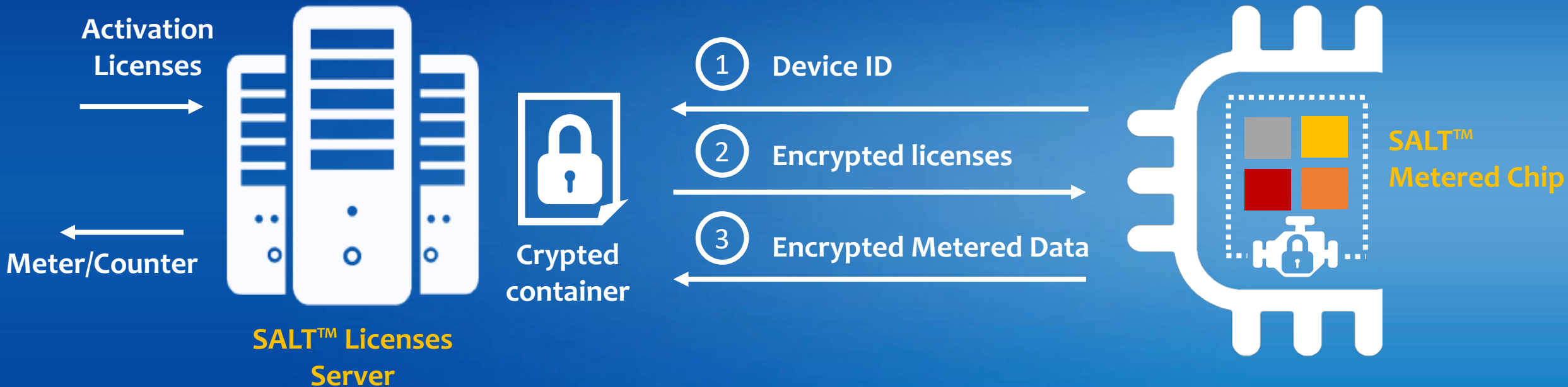
- data/video/event processed
- gates simulated
- ...

SALT: End-to-End Chip to Cloud Solution



- **Protection**
- **Configuration**
- **Activation**
- **Metering**

SALT Meter: Cloud-to-Chip Secure Provisioning



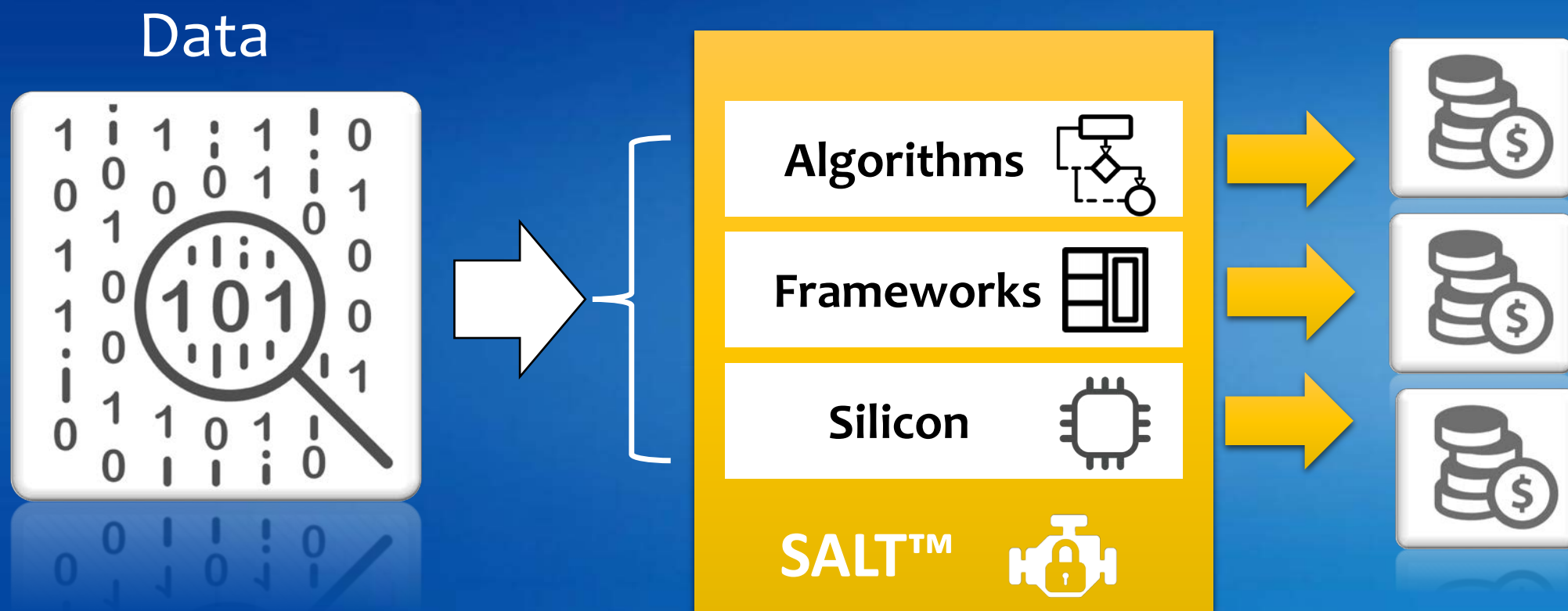
Secure Communication from cloud license server to individual device

Silicon-as-a-Service Opportunities in AI & ML

What	Why
AI-specific silicon	Not every company can afford to develop their own AI silicon or buy AI chip
AI acceleration on FPGA in the cloud	CPU based implementation does not satisfy performance requirements
AI framework for specific domain	Open source AI framework may not work well for all AI applications
AI Algorithms, pre-trained models, training data, applications	AI can be applied to diverse applications with different training data sets, pre-trained modules for people who just want to use AI not develop AI applications

Unleash the Power of AI & ML in the cloud through pay-per-use

SALT Meter: Reinvent Silicon Monetization for AI



Revenue Sharing from Applications to Silicon

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