

# Ograniczanie ryzyka w środowisku Autonomicznej Bazy Danych

**Jak zabezpieczyć dane przed podejrzanymi użytkownikami i otoczeniem przy wykorzystaniu najnowszych opcji Autonomicznej Bazy Danych związanych z bezpieczeństwem**

Witold Świerzy

Oracle PL

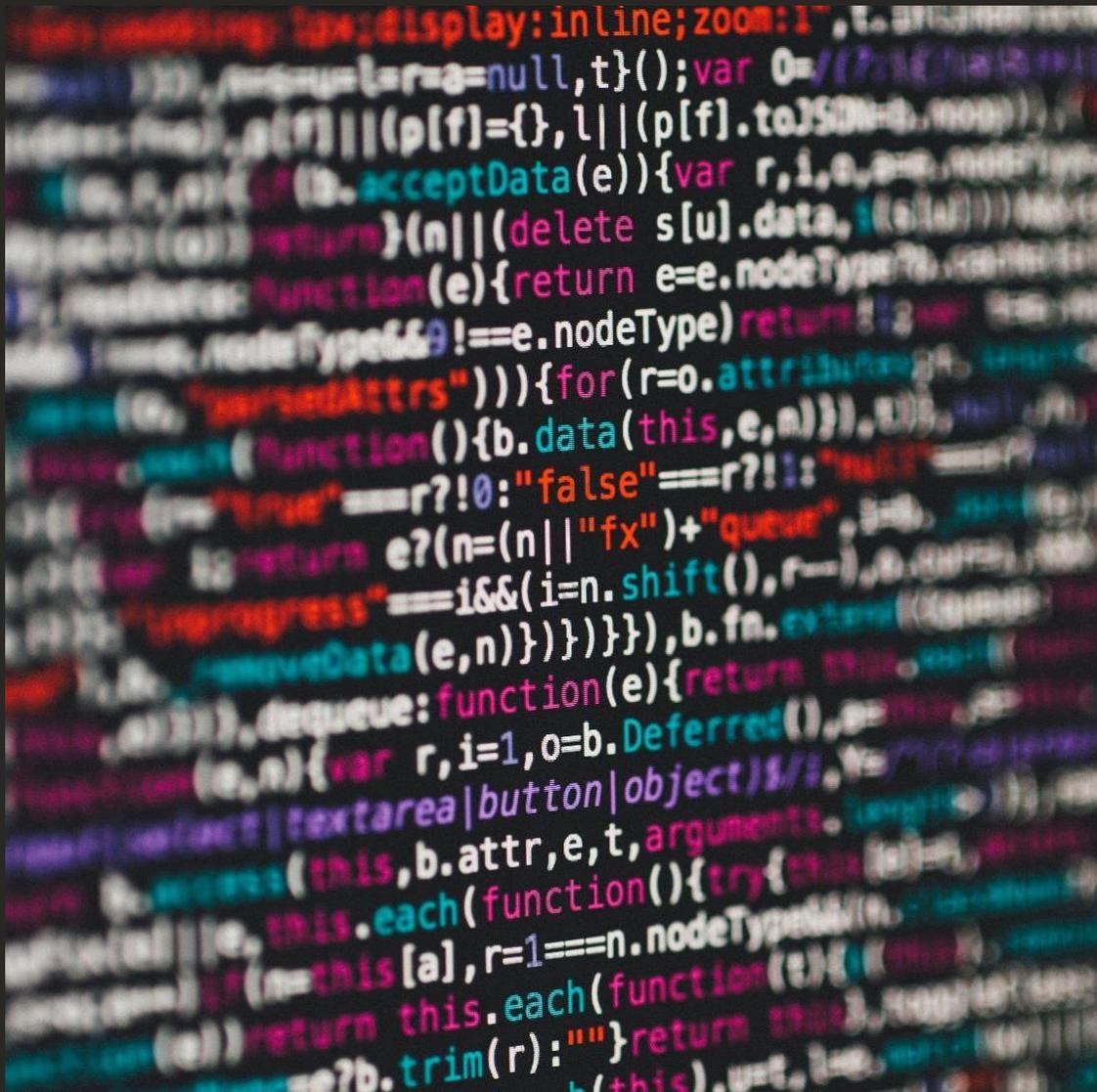
Październik 22, 2019

## Safe Harbor

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## Data – The Fuel for Digital Businesses

- Every business relies on digital data
- Creation rates exploding with innovative applications
- Significant driver of revenue and value creation
- Data can increase business risk

# Data — The Holy Grail for Attackers

**175 Zettabytes**

Global data by 2025

**4.1 Billion**

Records breached 1H2019

**\$700 Million**

Largest fine by FTC for data breach

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**40%**

Annual growth in company data

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**885 Million**

Largest single breach (so far) for 2019

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**\$230 Million**

Largest GDPR fine to date

# Security Challenges



## Technology Stack

- Multi-vendor security stack
- Complexity in systems and configs
- Mobile, cloud, IoT, containers...

## Shortage of Expertise

- Inability to find qualified staff
- Misuse/underuse of security products
- Inability to innovate, short staffed

## Keeping Up

- Patching and maintaining systems
- Consistency across infrastructure
- New attack methods and techniques



# 66%

CxOs cite security as  
biggest benefit of  
cloud

# Dependency on Cloud Services Compounding Cybersecurity Challenges



## Shortage of Skills

- 53% - Cybersecurity skills
- 38% - IT architecture / planning
- 35% - Artificial Intelligence / Machine Learning (AI / ML)



53%

Are using Machine Learning for cybersecurity purposes

Source: [Oracle and KPMG Cloud Threat Report 2019](#)

# The Future Is Autonomous Database



## CUSTOMER PERSPECTIVE

“ We are at the dawn of the intelligent, autonomous age and having a self-driving database is a natural progression... I feel that autonomous databases will become ubiquitous in the future.

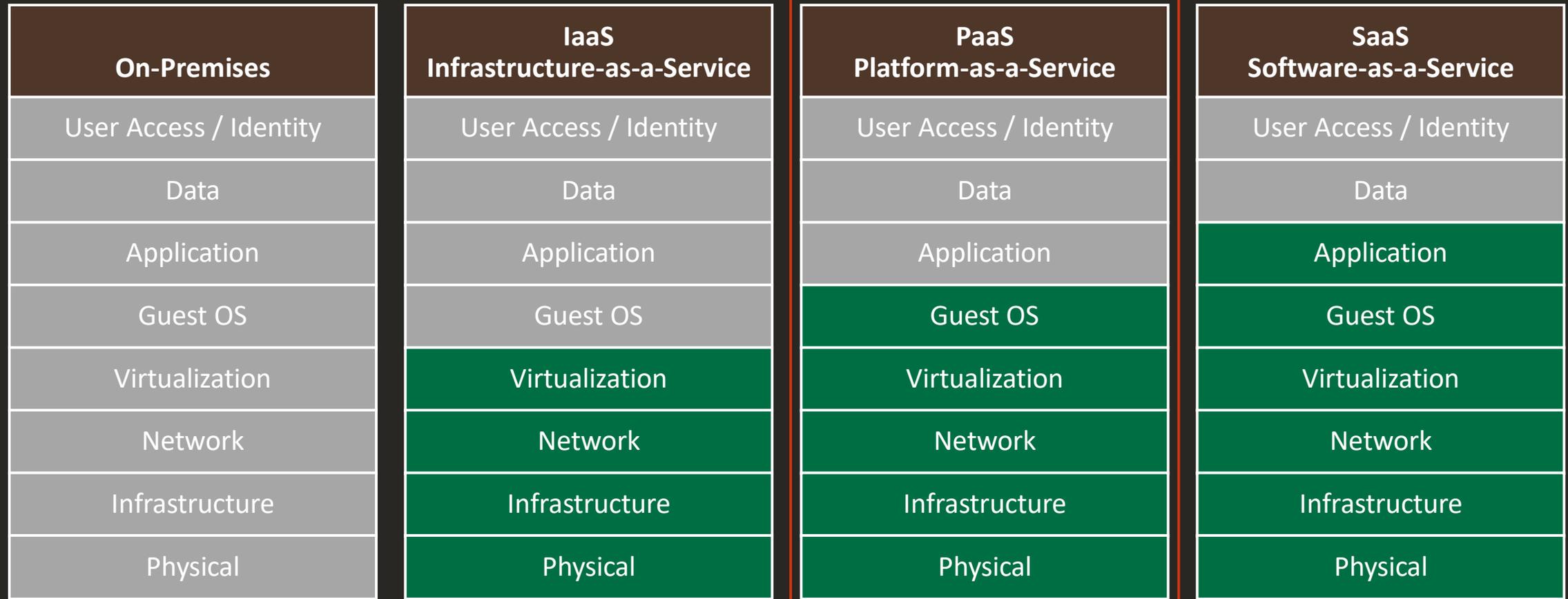
Clark A. Kho , Senior Technology Architect, Accenture



Source: [Oracle and KPMG Cloud Threat Report 2019](#)



# Traditional Shared Responsibility Model



Service Consumer Responsibility

Service Provider Responsibility

# Autonomous Database Shared Responsibility Model

DBaaS (PaaS) Database-as-a-Service	Autonomous Database
User Access / Identity	User Access / Identity
Data	Data
Database	Database
Guest OS	Guest OS
Virtualization	Virtualization
Network	Network
Infrastructure	Infrastructure
Physical	Physical



**Autonomous DBaaS**  
shifts closer to a SaaS  
Responsibility Model

Service Consumer Responsibility

Service Provider Responsibility

# Oracle Autonomous Database



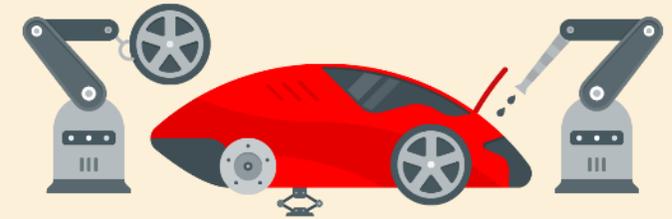
## Self-Driving

Reduces  
human labor



## Self-Securing

Protects itself  
from attacks



## Self-Repairing

Keeps business up  
and running

**World's First Autonomous Database**

A New Industry Category

# Under the hood of **Self-Securing**



## Benefits

- Secure configuration with full database encryption
- Automatically applies security updates online
- Sensitive data hidden from Oracle or customer admins
- Protects from both external and malicious internal threats

## Oracle Technology

Monitors threats, applies security **updates online**, stops admin snooping with **DB Vault**, **encrypts** all data

## Autonomous Database Capabilities

Gen 2 Infrastructure Foundation

Denial of Service Attack

Self Patching and Configuration

Encryption by Default

Separation of Duties

Auditing

Data Safe\*

Available on Dedicated Infrastructure\*

*\* = Now available in Fall 2019*

# Self-Securing | Patching and Configuration

Quarterly patching of all components  
(on-demand for critical security issue)

- Firmware, OS, Hypervisor, Clusterware, Database
- Installs prebuilt Gold Image of patched database executables rather than directly applying patches

Patching is automatically scheduled

- Customer can adjust timing within a time range

Patches applied rolling across RAC nodes and  
Exadata storage servers

- Database is continuously available to application
- Applications using Application Continuity best practices run without interruption

# Self-Securing | Data Encryption by Default



## Encryption for Data at Rest

- Automatically configured – all application data is encrypted within the database
- Database Backups are also encrypted



## Encryption for Data in Motion

- Automatically configured – all network access is encrypted to and from the database
- Choice of two methods
  - Oracle Native Network Encryption
  - Transport Layer Security (TLS) v1.2 (default)

# Autonomous Database Dedicated Infrastructure

## Private Reserved Infrastructure in Public Cloud

- Single Tenant
- Dedicated Exadata Infrastructure
- **Databases of any size** scale, or criticality

## Highest Security **Secure Isolation Zone**

- **Perimeter Control Computers:** Impenetrable Barrier
- Highest protection from other tenants
- Container Databases for intra-company isolation

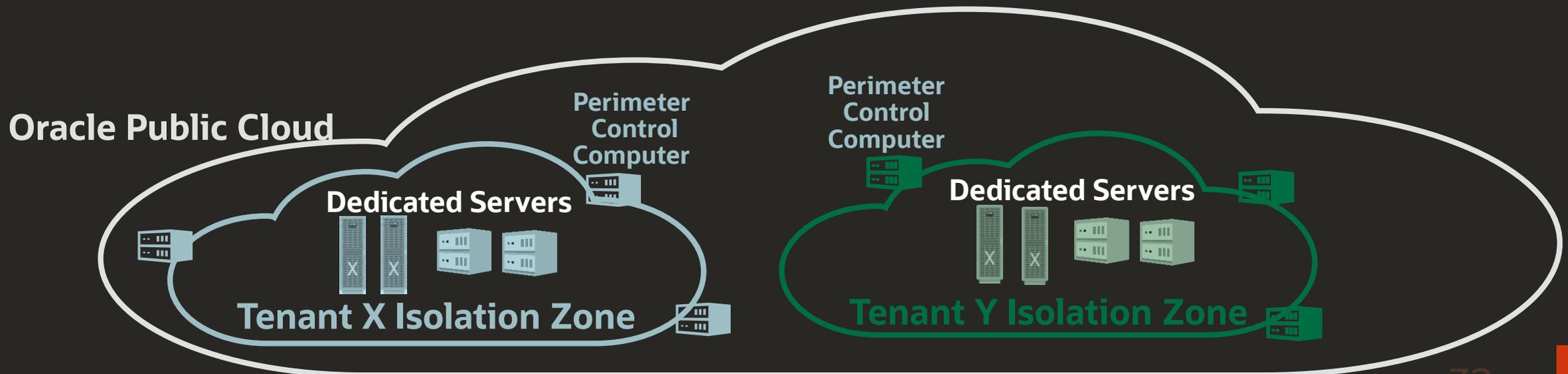
## Customizable **Operational Policies**

- Control of provisioning, updates, availability, density



# Gen2 Oracle Cloud Security Hardware: **Secure Isolation Zones**

- **Dedicated Servers** inside tenant's isolation zone run tenant's VMs and DBs
  - Dedicated Servers protects from security exploits at the VM, OS, and other software levels
- Perimeter Control Computers filter all incoming network packets
  - Perimeter Control Computers not visible on the network
  - Immune from software and zero-day exploits



# Common Reasons for Database Breaches

- Unencrypted data
- Security patches not applied
- Administrator Snooping
- Malware / Viruses
- Poor Network Isolation

Security configuration drift  
Unmanaged privileged users  
Unaudited users  
Untracked sensitive data  
Sensitive data in open

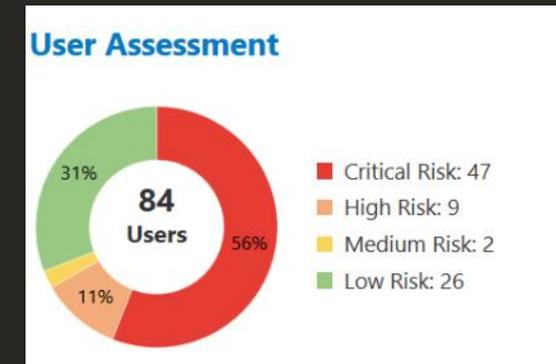
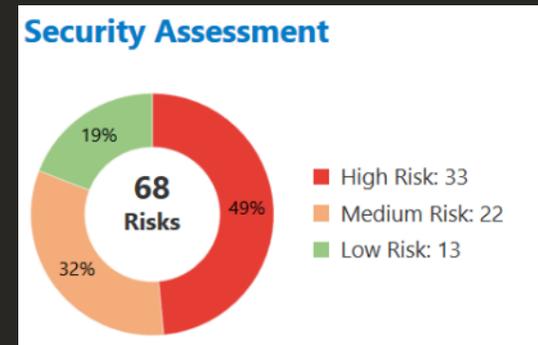
Addressed by  
OCI/Autonomous Database

Currently  
Customer Responsibility

# Announcing | Oracle Data Safe

Autonomous Database | Now even more Secure

- Unified Database Security Control Center
  - Security Assessment
  - User Assessment
  - User Activity Auditing
  - Sensitive Data Discovery
  - Sensitive Data Masking
- Saves time and mitigates security risks
- Defense in Depth for all customers
- No special security expertise needed



Available with Oracle Cloud Databases at no additional cost



# Comparing Security Services for Cloud Databases

Functionality	Amazon AWS	Microsoft Azure	Google Cloud	Oracle
Database Encryption	Available	Included	Included	<b>INCLUDED</b> with Cloud Databases
Strong Separation of Duty				<b>INCLUDED</b> with Autonomous Databases and Enterprise editions
Security Patching				<b>INCLUDED</b> with Autonomous Databases
Security Assessment	-	SQL Adv. Threat Protection	-	Data Safe
Data Discovery	-	SQL Adv. Threat Protection		Data Safe
Data Masking	-	-		Data Safe
User Assessment	-	-	-	Data Safe
User Activity Auditing	CloudTrail, CloudWatch, GuardDuty	SQL Adv. Threat Protection	Stack Driver Logging	Data Safe
Pricing	Fine grained	\$15/mo/target	Fine grained	<b>FREE</b>

# Always Free Oracle Autonomous Database



- **Always Free: Two Databases per Cloud Tenancy** <sup>+</sup>
  - Each Database gets 1 OCPU and 20 GB storage
- **Free Tools** for Application Development
  - APEX for low-code, web-based app development
  - SQL Developer Web for database development
  - SQL Notebooks for Machine Learning
  - Automatic REST for easy access and publishing of DB data
  - Drivers for all popular programming languages

<sup>+</sup> Free Oracle Autonomous Database does not include Data Safe



# Only Oracle Provides the First Fully Autonomous Database

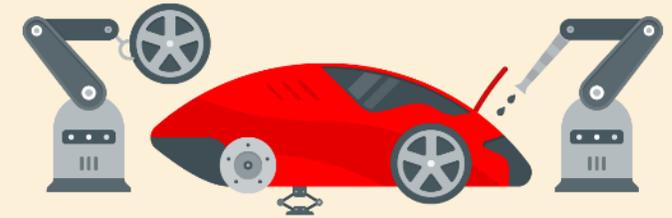


## Self-Driving



## Self-Securing

- Gen 2 Infrastructure Foundation
- Denial of Service Attack
- Self Patching and Configuration
- Encryption by Default
- Separation of Duties
- Auditing
- Data Safe
- Available on Dedicated Infrastructure



## Self-Repairing

**Thank You**

