



**UNIFACE**  
Advanced Development Technology

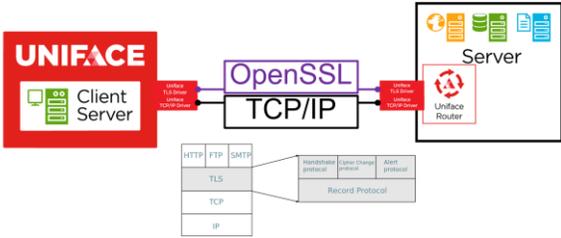
**Solution Architecture: Data Security**  
**12 June 2019**

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Director, Global Delivery

# Agenda

- A different perspective
- Mitigating the risk
- The proposed solution

## TLS layer over TCP/IP, using OpenSSL



## Consequences

- ▲ Average cost of a data breach ~\$4M
- ▲ Identity theft in US cost ~\$16Bn in 2014 alone
- ▲ GDPR fines
  - ▲ Up to €10 million or 2% of annual turnover
  - ▲ Up to €20 million or 4% of annual turnover



## Buffer overflows

...but ever present  
... & instructions

## Session Hijacking

- These attacks include techniques like:
- ▲ Session Fixation
  - ▲ Session Sidejacking
  - ▲ Physical Access



## Common Threats

- ▲ Man in the Middle / Snooping
- ▲ Password Cracking
- ▲ Buffer overflows
- ▲ Interpreter Injection
  - SQL Injection
  - JavaScript Injection
  - Parameter Manipulation
- ▲ Session Hijacking



## "...everyone needs to worry"

- ▲ Accidental hacker
- ▲ Cyber criminals
- ▲ Not just a privacy issue
- ▲ Increasingly connected, integrated & exposed
- ▲ Desktop, Web, Mobile, ...as a Service
- ▲ Increasingly a developer role
- ▲ ...



## It's complex

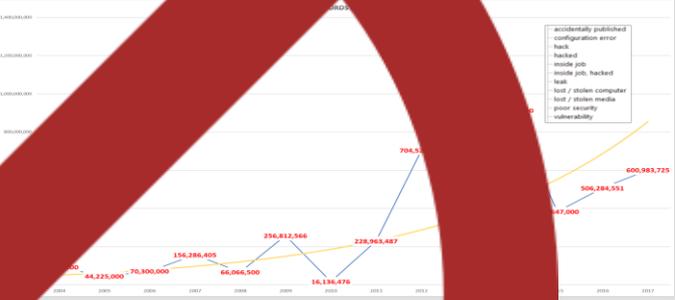
$$\max_{M,u,v} |U(E_N, M, u, v)| = \max_{M,u,v} \left| \sum_{i=0}^{n-1} e_{u+i} v_i \right|$$

$$\max_{M,D} |V(E_N, M, D)| = \max_{M,D} \left| \sum_{n=1}^M e_{n+d_1} e_{n+d_2} \dots e_{n+d_k} \right|$$

Don't be put off  
Call the experts too



## Global data breach



## Password Cracking

- ▲ Brute force the login page
- ▲ Brute force the database with common passwords
- ▲ Rainbow tables

!,MU99,#,Ms99,\$,NE99,%,NU99,&,Nc99,  
,,Ns99,(,OE99,)OU99,\*Oc99+,Os99,  
,,HE99,-,HU99,,Hc99,"",Hs99,0,IE99



## OpenSSL

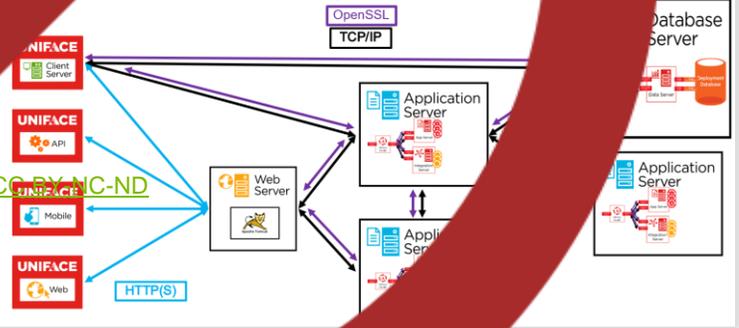
- ▲ 'Swiss Army Knife' of cryptography
- ▲ Backed by major organisations and government institutions
- ▲ Well maintained, and supported
- ▲ Excellent platform coverage
- ▲ openssl ciphers -v
  - ▲ Kx (Key Exchange algorithm)
  - ▲ Au (Authentication algorithm)
  - ▲ Enc (Encryption algorithm)
  - ▲ Mac (Message authentication code)



## Denial of Service

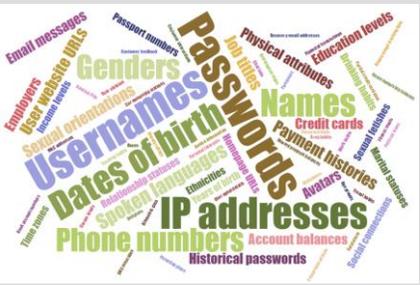
(distributed) Denial of Service  
Flood, Consume, Overload  
Software

## Uniface Deployment Example



## Uniface – always keep in mind

- ▲ Path Scrambler
- ▲ SQL statement and where
- ▲ RAW HTML
- ▲ \$webinfo
- ▲ WRD error page
- ▲ Hitlist, profiles, table scan



## Man in the Middle

- ▲ Privacy breach
- ▲ Promiscuous mode
- ▲ Spyware / Rootkits
- ▲ Key loggers
- ▲ Plugins
- ▲ Proxies
- ▲ Decompilers & Debuggers
- ▲ ... & many more



## Cryptography is important for Uniface



These are not the solution:



Only as strong as...





# Question 1

- What do you feel is the most important business asset of an enterprise solution?
  - The algorithms / business rules / intellectual property
  - The business data
  - The physical infrastructure
  - The users



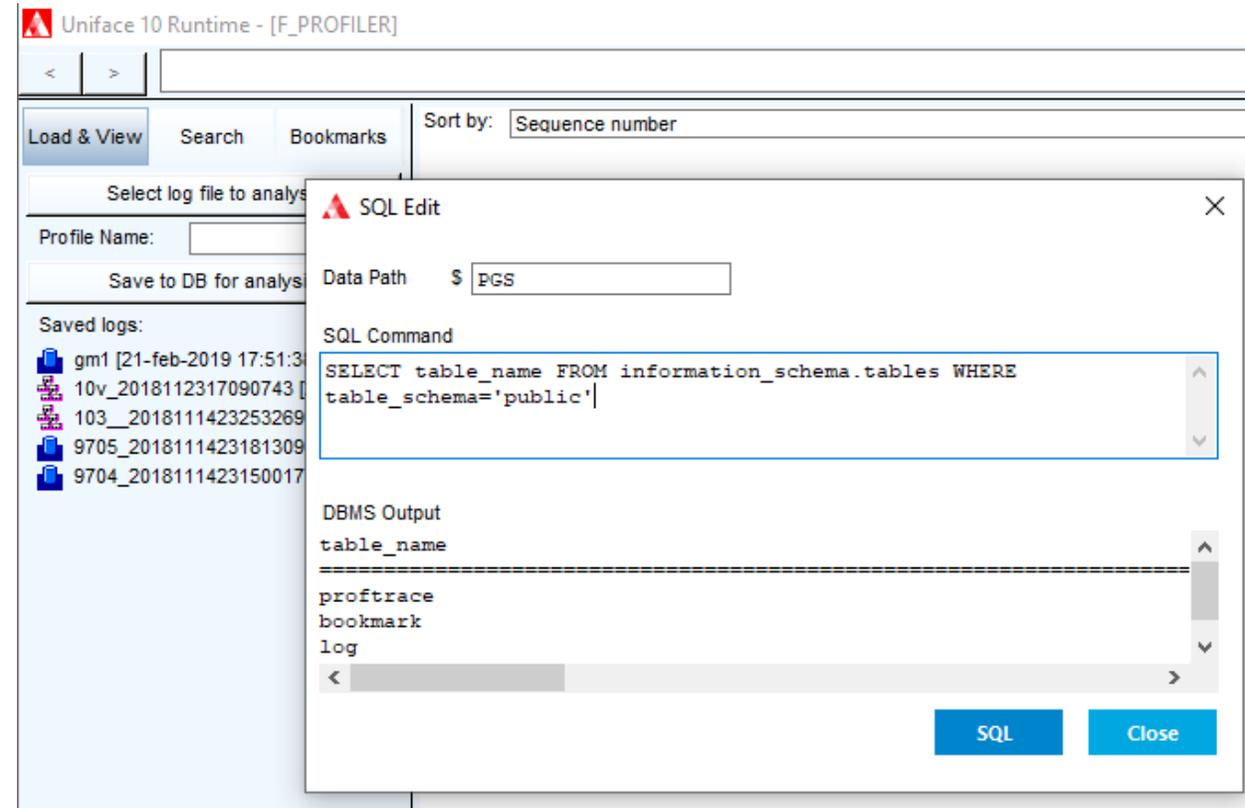
# Data is king

- Data is the precious resource
- Privacy laws and associated consequences
- Tangible asset on balance sheet?

## Question 2

- In a typical solution, what is a key undesirable risk to the data.





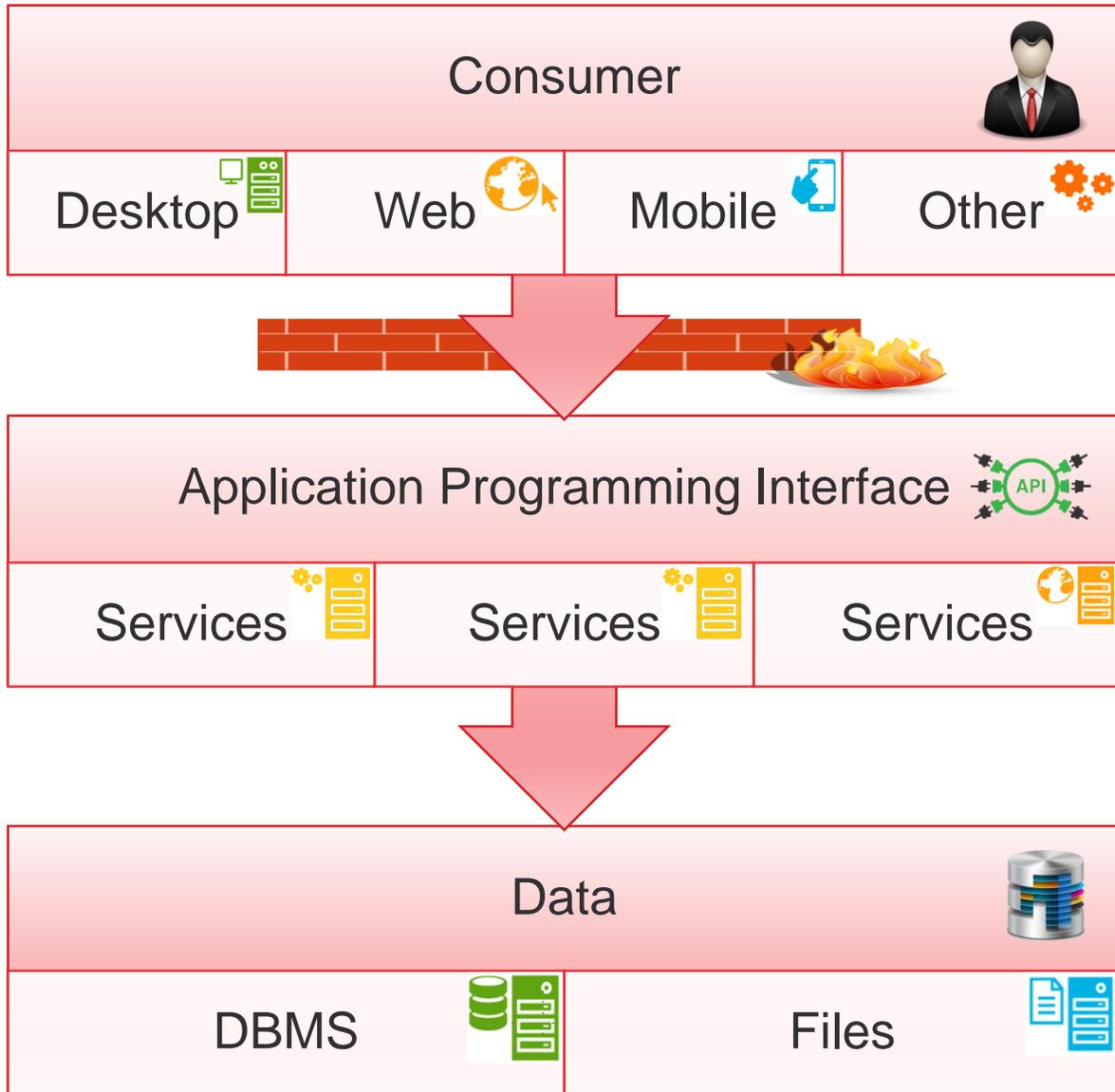
# Challenge / Risk

- Client runtime path to DBMS
- CRUD without control
- Connection details in plain sight

## Question 3

- Which of the following can mitigate the risk outlined?
  - Uniface Data Server
  - Uniface Application Server
  - Keyboard translation tables
  - Disable SQL workbench
  - Web deployment





# A proposed solution

- Remove direct DBMS access
- Service Oriented Architecture
- Thin Client / Web

# THANK YOU & QUESTIONS

