



UNIFACE
Advanced Development Technology

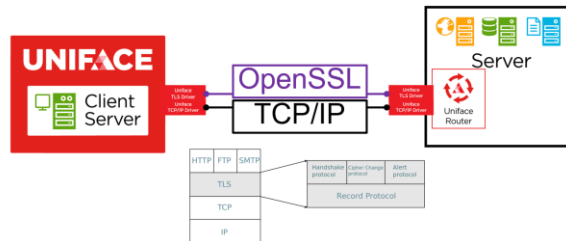
Solution Architecture: Data Security
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Agenda

- 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

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

$$\max_{M,u,v} |U(E_N, M, u, v)| = \max_{M,u,v} \left| \sum_{j=0}^{n-1} e_{u+jv} \right|$$
$$\max_{M,D} |V(E_N, M, D)| = \max_{M,D} \left| \sum_{n=1}^M e_{n+d_1} e_{n+d_2} \dots e_{n+d_k} \right|$$

Don't be put off

Call the experts too



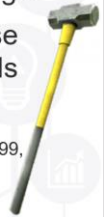
Global data breach



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

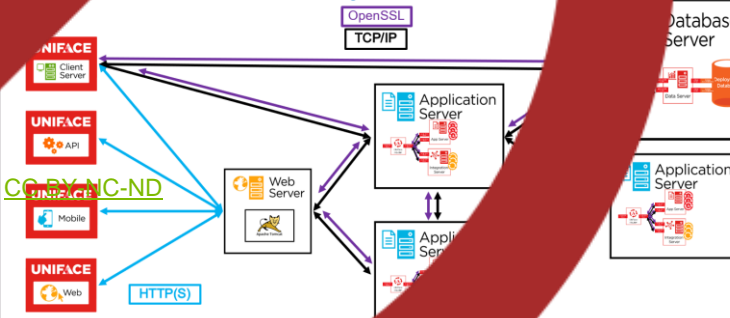
Flood, Consume, Overload

Software

This is unknown

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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
- ▲ ...and many more



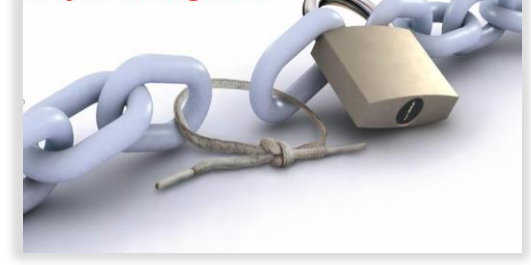
Cryptography is important for Uniface



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?

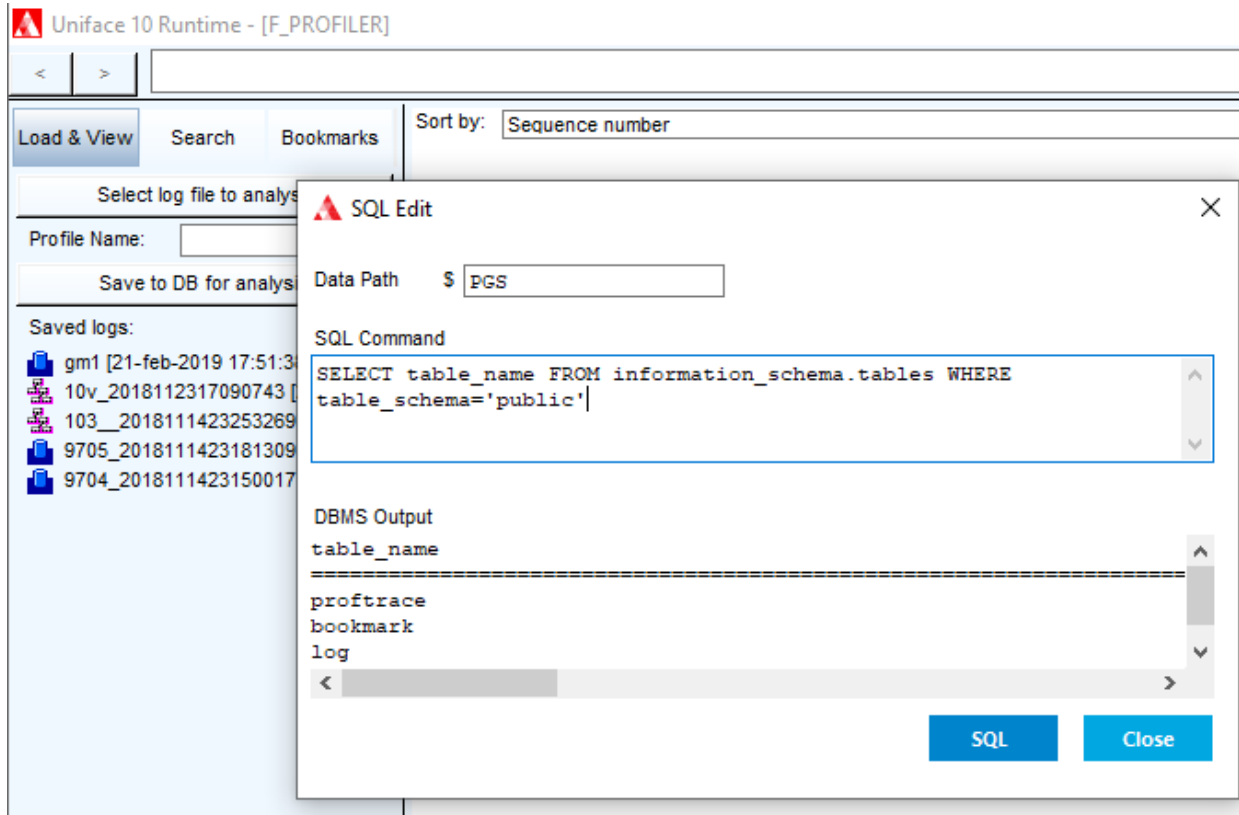
Question 2

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



Challenge / Risk

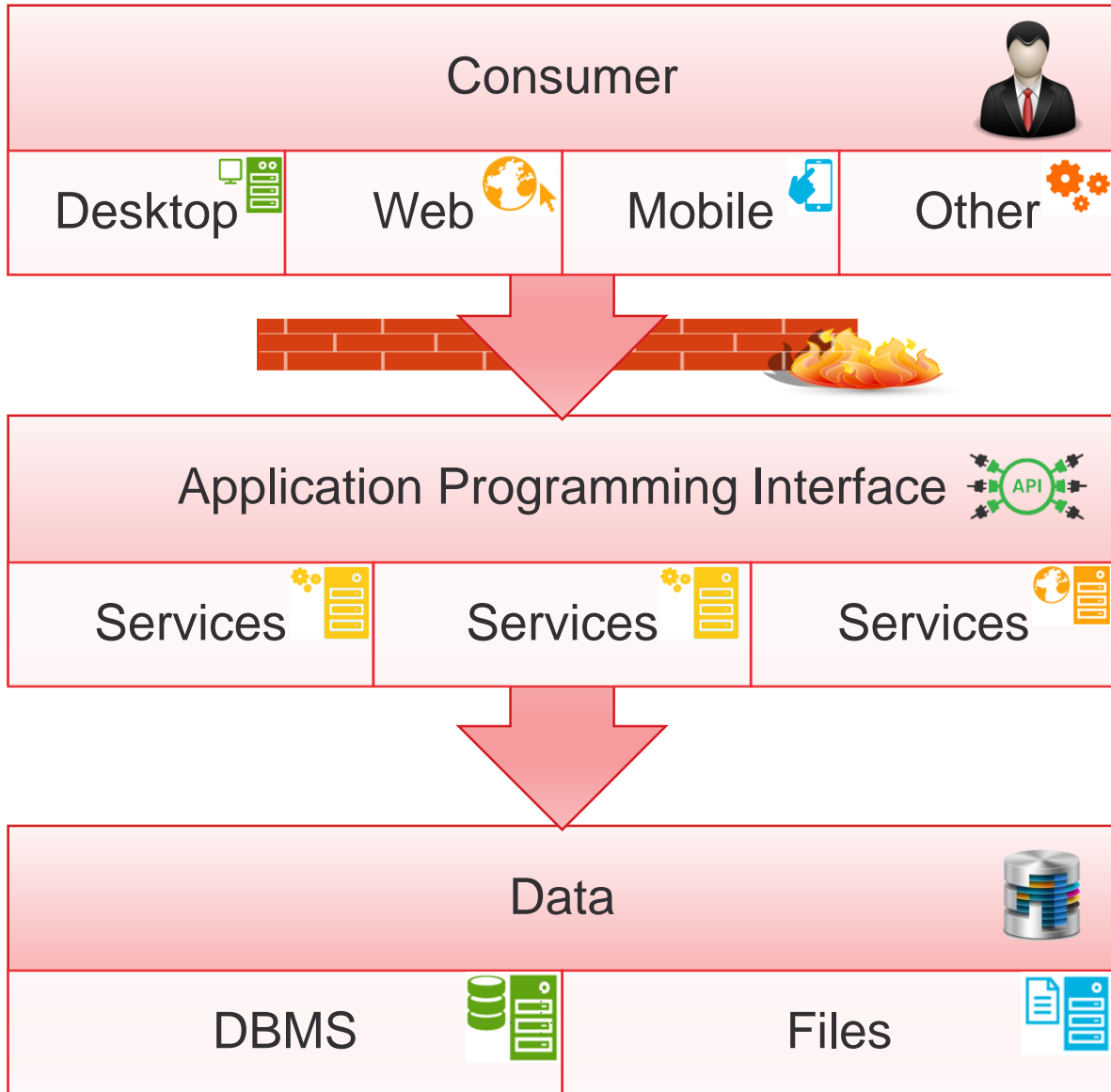
- Client runtime path to DBMS
- CRUD without control
- Connection details in plain sight



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

