The Organisation As A System

Structured Coherent Design

Anything Else To Consider?

Anything Else To Think About?

The last deck of a series of seven covering “other considerations. The full set listed below.

- 0. Operating Concepts
- 1. Data Capture and validation
- 2. Operational Alignment
- 3. Fact Generation
- 4. Evidence Collation
- 5. Pattern recognition et al
- 6. Extending the scope
- 7. Anything Else To Think About?

Anything Else to Consider?

- Purpose – The last of a series of slide decks on the subject of “data has legs” and changes form and function as the information requirement changes. This deck on supporting concepts
- Target audience – non technical people who need to understand what information management might be capable of contributing as part of an enterprise architecture initiative
- First of 3 presentations on Organisation mapping two others, aligning process and “pulling it together”
- Run Time - Approximately 45 mins.

Anything Else to Consider?

- Clear Line of Sight
- Centralised control v delegated responsibility
- The ability to “burrow”
- Any point entry
- Evidence based decision support
- Portal Everywhere
- Structured and unstructured data
- Management and control of data location

Anything Else to Consider?

Person As “Thing”

Anything Else to Consider?

The EU E Privacy Directive

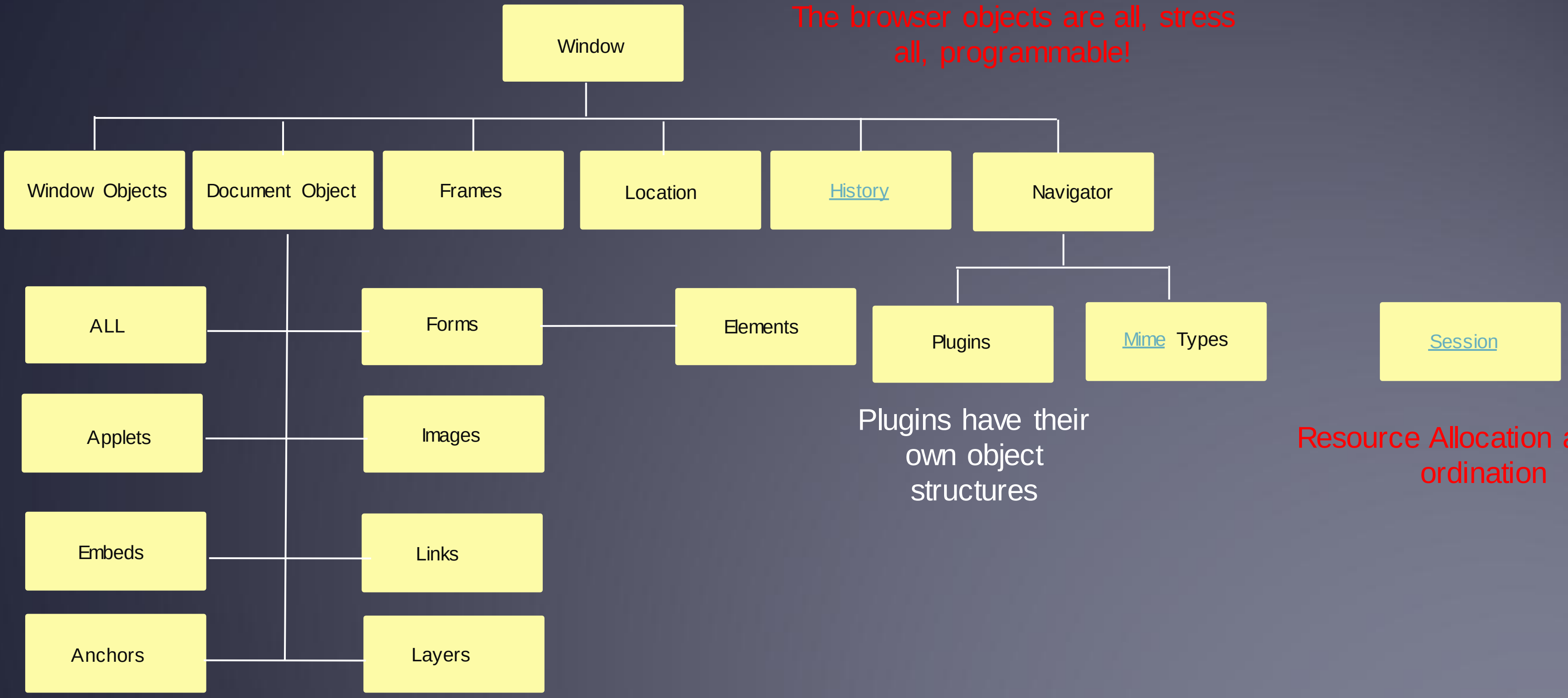
Page 3, para 24……. Read it carefully

> “Terminal equipment of users of electronic communications networks and any information stored on such equipment are part of the private sphere of the users requiring protection under the European Convention for the Protection of Human Rights and Fundamental Freedoms. So-called spyware, web bugs, hidden identifiers and other similar devices can enter the user’s terminal without their knowledge in order to gain access to information, to store hidden information or to trace the activities of the user and may seriously intrude upon the privacy of these users. The use of such devices should be allowed only for legitimate purposes, with the knowledge of the users concerned.”

Now read the rest..... E Privacy Directive

Anything Else to Consider?

Client Side Browser Objects



Window

Window Objects

Document Object

Frames

Location

History

Navigator

ALL

Applets

Embeds

Anchors

Forms

Images

Links

Layers

Elements

Plugins

Mime Types

Session

The browser objects are all, stress all, programmable!

Plugins have their own object structures

Resource Allocation and Co-ordination

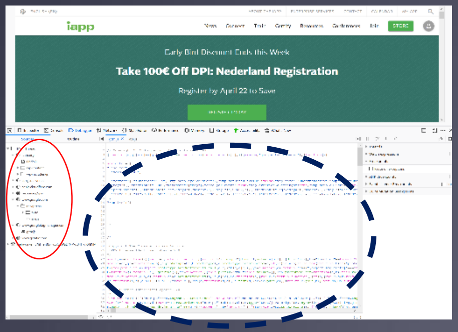
It is the browser object model and its constituent parts, that give a page structure. It is the browser object model on client devices, that gives the means to identify their patterns of behaviour

Anything Else to Consider?

On Cookies (Pre cookie banner consent selection….)

Cookies are small files or database records of a paired value type. They do not transmit or receive anything. They are place markers.

On Tor, the very second browser step outside the Tor network, those who know, know.

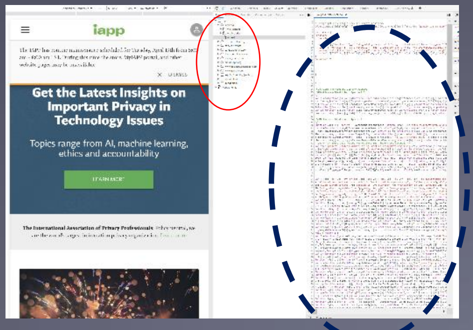


Early Bird Discount Ends this Week

Take 100€ Off DPI: Nederland Registration

Register by April 22 to Save

Tor



Get the Latest Insights on Important Privacy in Technology Issues

Topics range from AI, machine learning, ethics and accountability

The International Association of Privacy Professionals

Any Other Browser

In both images above, the code indicated by the blue dashed circles has already been called from a third party and executed before a cookie banner selection has been made by the end user

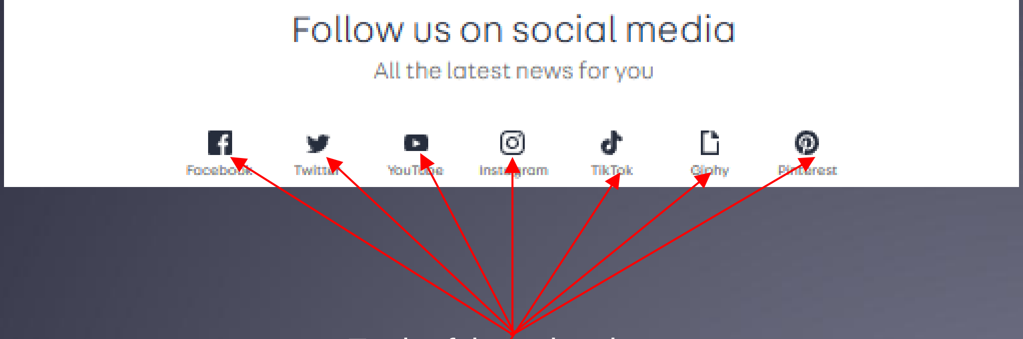
In the samples above, it is the code that does the end user profiling. Not the cookies.

Since Google announced 3rd Party cookie deprecation, the inventiveness around not using cookies at all, has been applied at speed and with rigour

Cookie banners are fast becoming redundant, if indeed they ever worked at all

Anything Else to Consider?

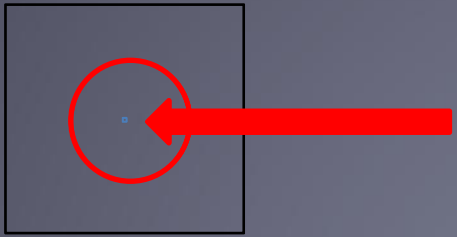
And Beacons….



Follow us on social media

All the latest news for you

Each of these is a beacon



Or this, a single pixel,
colourless gif image
invisible to the human eye

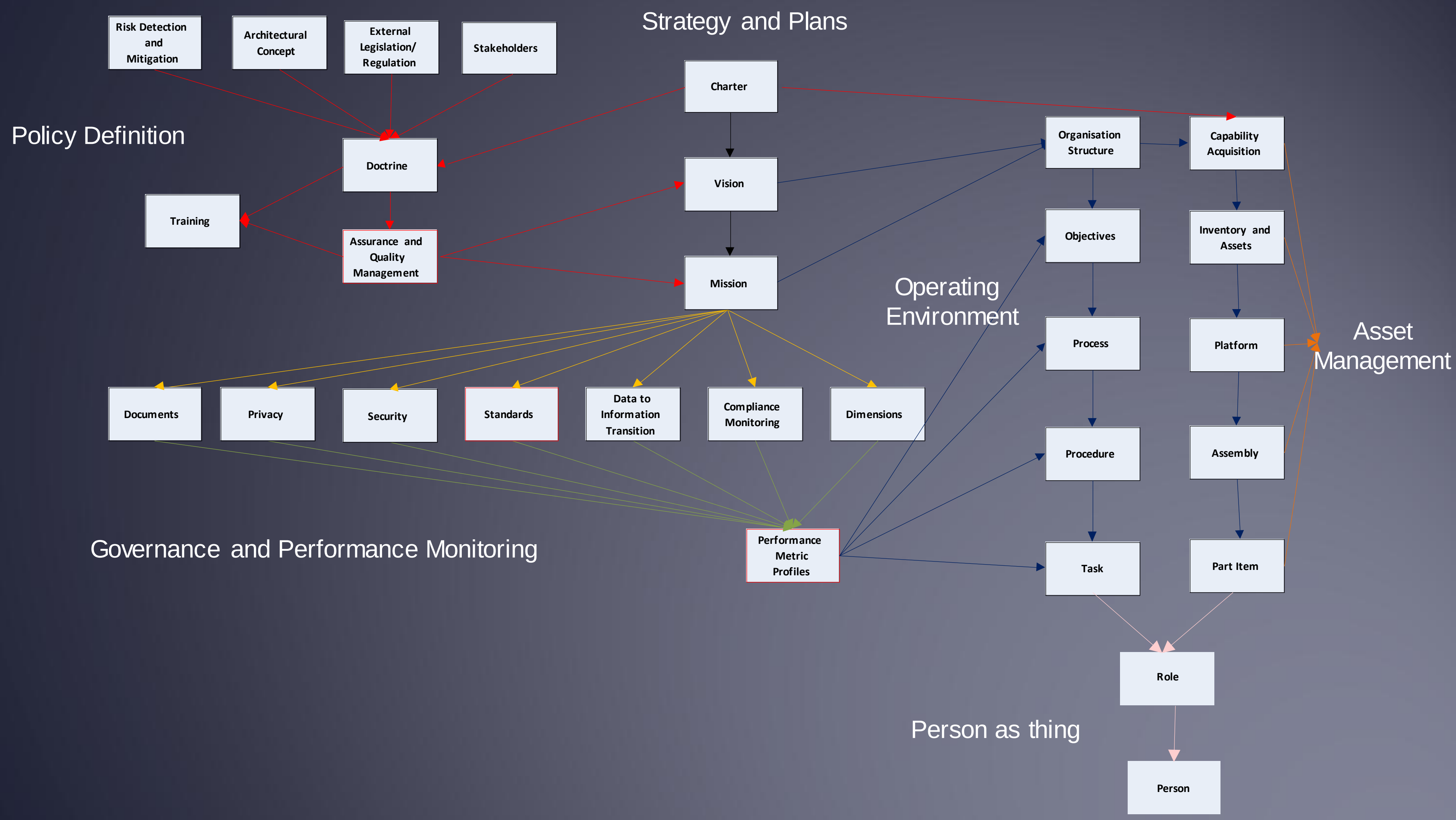
Requested, by the end user device as a page object “tag” that will look like this..

```
<img alt="" border="0" src="https://www.abeaconowner.com/en_GB/i/scr/pixel.gif" width="1" height="1" />
```

The advantage? Beacons will be loaded into a client device even if they switch of client side code execution

Anything Else to Consider?

"Person as thing" may have multiple interactions with the organisation as a system



Separate "person as thing" as a group of "things" that have one or more roles
Associate data and information exchange with role rather than the individual

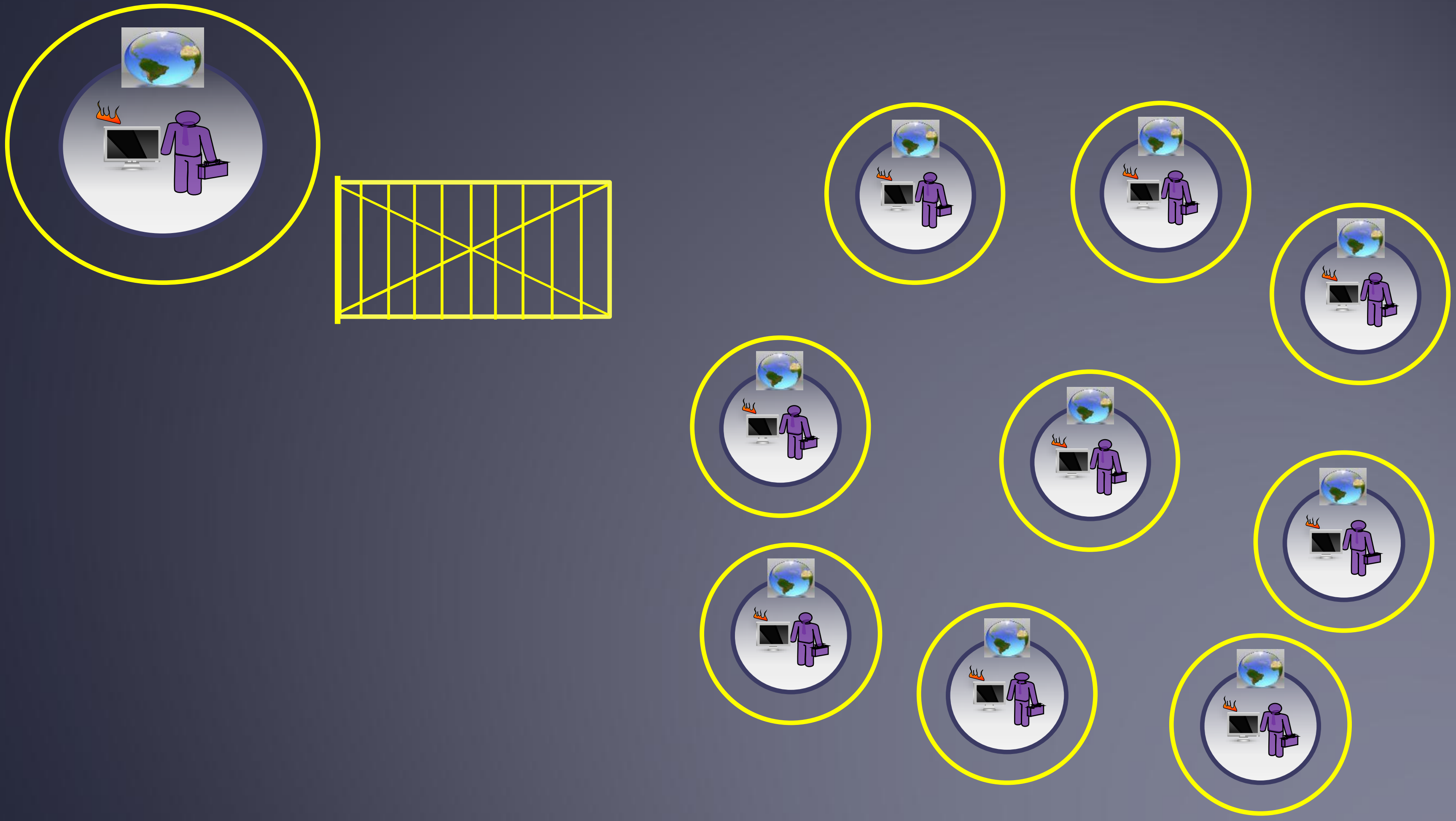
Anything Else to Consider?

End User Sphere of Privacy – Nothing sent client side without consent

The minimum amount of data, for the shortest period of time consistent with legitimate interest and external legislation requirements

Anything Else to Consider?

To Anyone!



Everyone, on their equipment, has their own privacy sphere…. With each kept distinctly separate.

Anything Else to Consider?

Proper Planning and Preparation Prevents Poor Performance

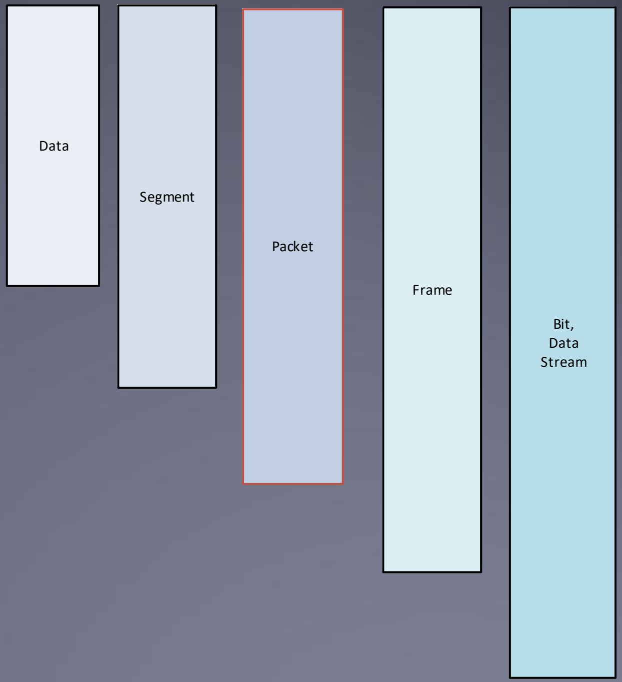
Anything Else to Consider?

The "OSI 7 Layer Model"

The Layers

Application	Application services and protocols	FTP, HTTP, HTTPS etc
Presentation	Data formatting Encryption etc	ANSI/W3C standards
Session	Conversation level controls	Co-ordinated machine to machine resource allocations
Transport	Sequencing of data transfer	Ports, tracert, TLS
Network	Logical addressing	Routing, DNS, TLD
Data	Physical addressing	Bridges, switches etc
Physical	Network topology, physical machines	Screens, keyboards all hardware peripherals etc

Data Forms Between Layers



The OSI model gives a good means to describe the nature of hardware and software "fit" as a means of setting out the hardware and software architecture and how they interact

Anything Else to Consider?

Design Integrity

Requirements Gathering – requirements gathering techniques…

Data Design – database design considerations here

Domain Impact – different domains (business areas) have different needs

Supporting Software Infrastructure – object models, code standards and more all vary

Supporting Hardware Infrastructure - Hardware has an architecture all of its own.

Anything Else to Consider?

Structural Integrity

Coding Standards – Meet DORA an EU code standards framework

Maintainability – Capability maturity from the US DoD post “sunburst”

Testing – There are multiple testing methodologies a list of the more commonly used can be read here

User Interface – Some guidance, there is lots of guidance out there mind you

Anything Else to Consider?

POSIWID

As use grows and the volume of data increases with successful use, the issues below will raise their heads…

Scalability

Reliability

Availability

Performance

Accuracy

Speed of Response

Anything Else to Consider?

Nothing Is For Free

As use grows and the volume of data increases with successful use, the issues below will raise their heads…

Cost Estimation

Risk

Documentation

Migration Planning

Dependency

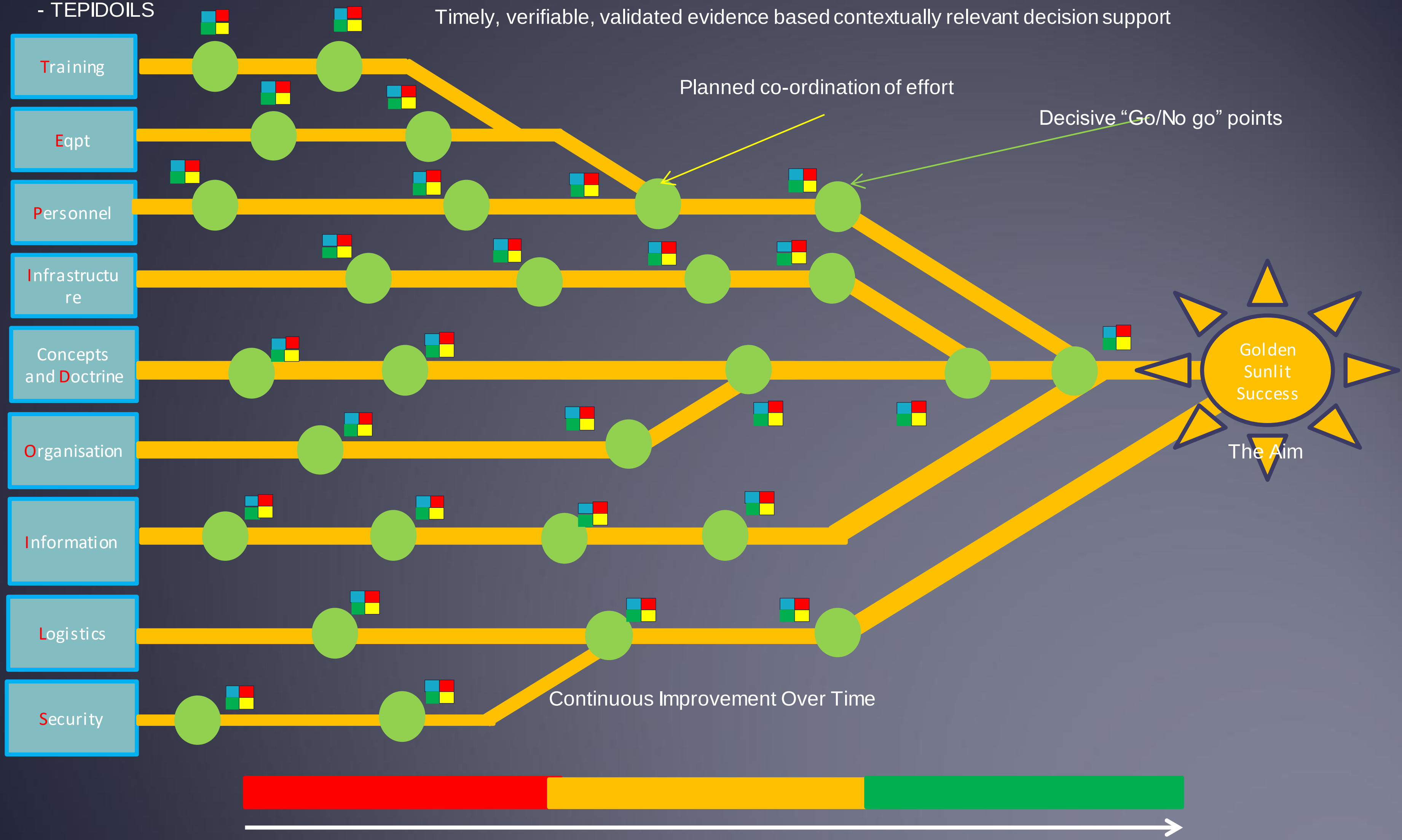
Training

The concept of mutually supportive and dependent "lines of development" capability management, on a through life basis applies

Anything Else to Consider?

Campaign Planning

The Lines of Development
- TEPIDOILS



Timely, verifiable, validated evidence based contextually relevant decision support

Planned co-ordination of effort

Decisive “Go/No go” points

Training

Eqpt

Personnel

Infrastructure

Concepts and Doctrine

Organisation

Information

Logistics

Security

Golden Sunlit Success

The Aim

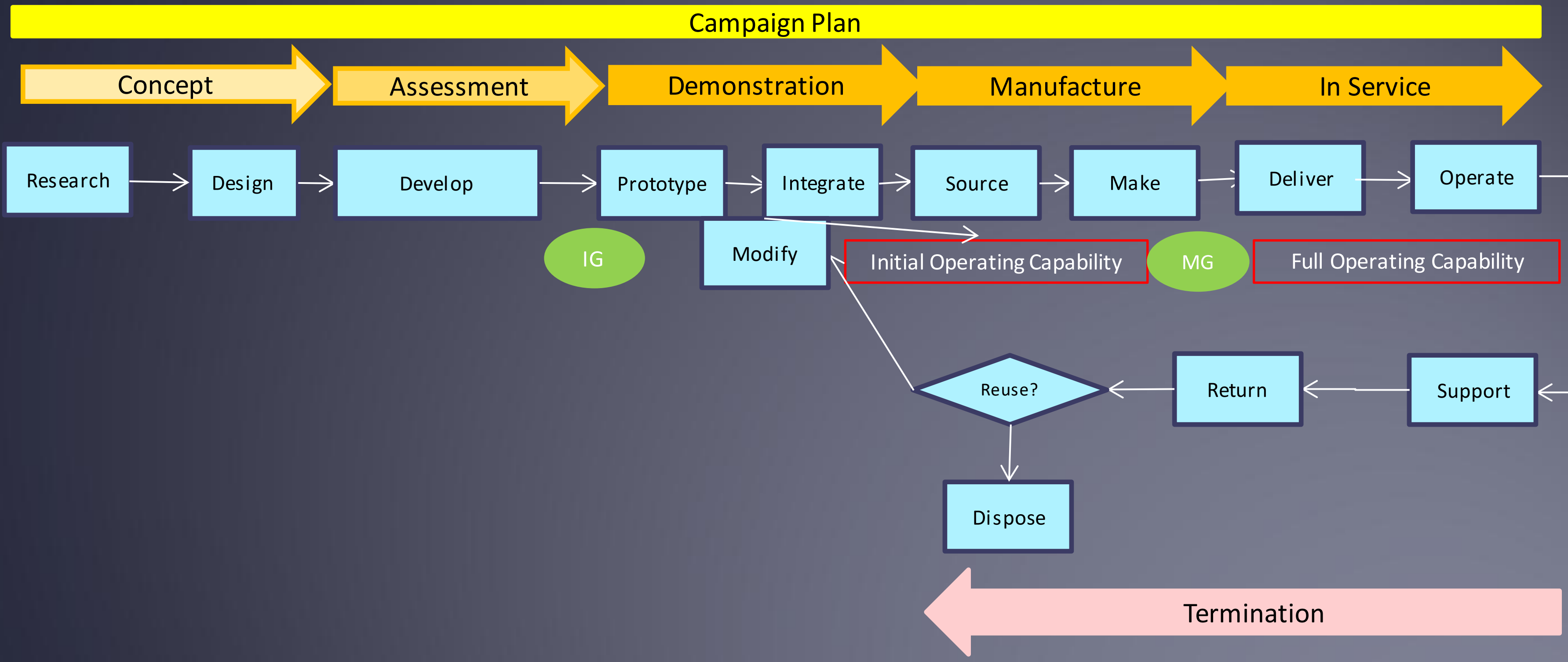
Continuous Improvement Over Time

Time

For each stage of capability acquisition

Anything Else to Consider?

Things have a life of their own… They are created, mature and are eventually discarded


Campaign Plan

Concept

Assessment

Demonstration

Manufacture

In Service

Research

Design

Develop

Prototype

Integrate

Source

Make

Deliver

Operate

IG

Modify

Initial Operating Capability

MG

Full Operating Capability

Reuse?

Return

Support

Dispose

Termination

Decisive Points: IG Initial MG Main Gate. Both of a “Go/No Go” kind.

Through Life, Forward and Reverse Supply - Enablement

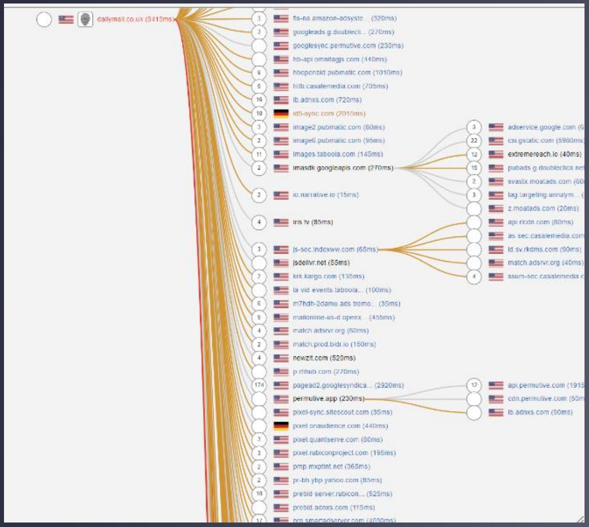
Anything Else to Consider?

The Law

Anything Else to Consider?

The Law – There is so much of it…

That is up against…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googleads.g.doublecli... (270ms)
googlesync.permutive.com (230ms)
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ib.adnxs.com (720ms)
id5-sync.com (2015ms)
image2.pubmatic.com (80ms)
image6.pubmatic.com (95ms)
images.taboola.com (145ms)
imasdk.googleapis.com (270ms)
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jsdelivr.net (55ms)
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match.adsrvr.org (60ms)
match.prod.bidr.io (150ms)
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p.rfihub.com (270ms)
pagead2.googlesyndica... (2920ms)
permutive.app (230ms)
pixel-sync.sitescout.com (35ms)
pixel.onaudience.com (440ms)
pixel.quantserve.com (80ms)
pixel.rubiconproject.com (195ms)
pmp.mxptint.net (365ms)
pr-bh.ybp.yahoo.com (85ms)
prebid-server.rubicon... (525ms)
prebid.adnxs.com (115ms)
prg.smartadserver.com (4030ms)
adservice.google.com
csi.gstatic.com (5960ms)
extremereach.io (40ms)
pubads.g.doubleclick.net
svastx.moatads.com
tag.targeting.unrulym...
z.moatads.com (20ms)
api.ricdn.com (80ms)
as-sec.casalemedia.com
id.sv.rkdms.com (90ms)
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cdn.permutive.com
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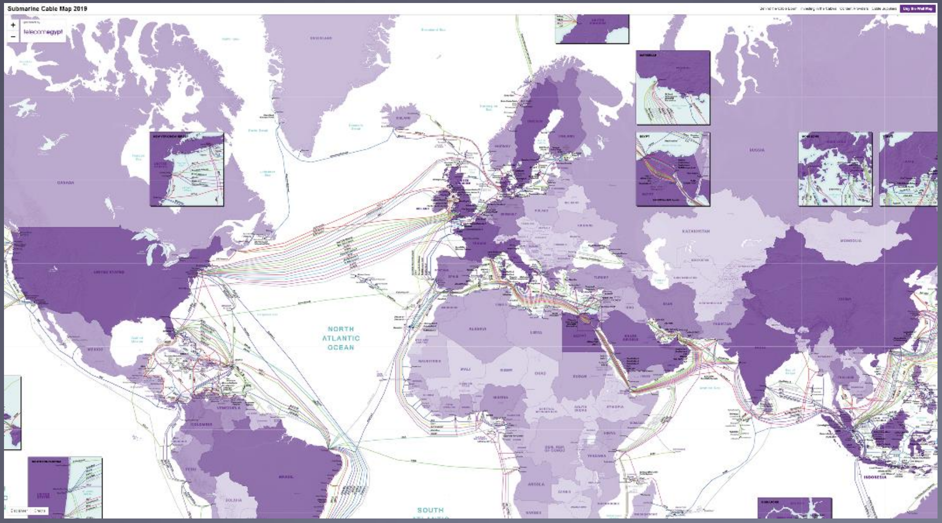


Code from anywhere, delivered at speed

Which also means that many (pretty much anyone who runs a web site nowadays) need to be aware of the requirements of a number of jurisdictions.. Not just their own..

Anything Else to Consider?

The Law – Nor is it “just” IT related Law, there is “the rest”

In the case of HSIS (an Health and Safety Information System built by the author) there was:

UK Health and Safety Law

REACH document standards

US Legislation related to ITAR

UK Data Protection Law

Anything Else to Consider?

The Law – Then there were internal and external professional standards like:

ISO, both engineering and tech related

Financial reporting rules

Internal technical standards

Internal security standards

And more….

Anything Else to Consider?

The Law – All of it difficult to police….

The UK ICO is reported to employ some 650 people.

But it is also responsible for more than a few major pieces of legislation

And…

There is a degree of domain control in that the must liaise with OFCOM and others to revise their policy and governance from time to time

There is often a need to strike a balance and carefully design and document what “legitimate Interest” means

We are all lawyers now it seems

Anything Else to Consider?

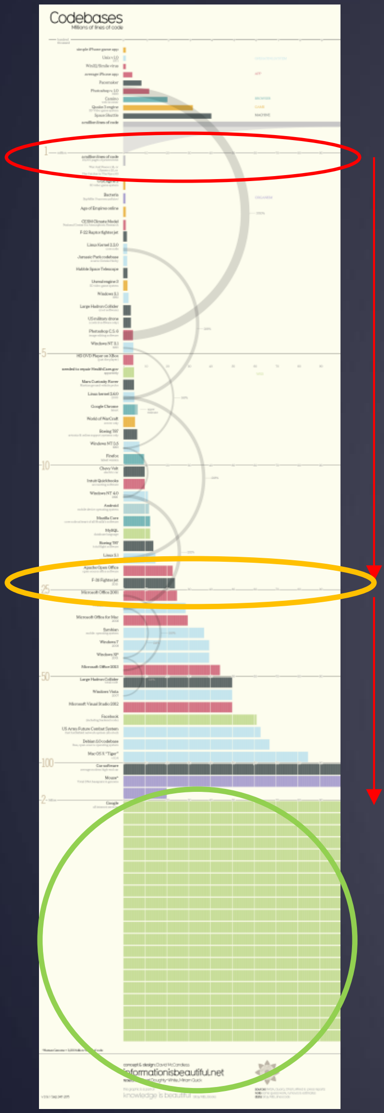
Using Other Peoples Software and Hardware

Anything Else to Consider?

Using Other Peoples Code (using web sites to illustrate)

Anything Else to Consider?

The Volume of Code…



Greater than 1 million lines of code

Greater than 50 million lines of code

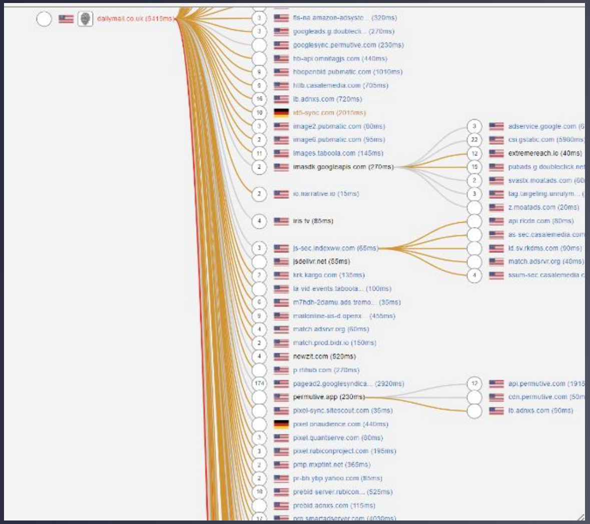
Billions of lines of code

This image, a few years old now, gives an estimated "line of code count" for many of the major IT programmes of work that existed at the time of publication.

Assuming a single line of code is equivalent to a single mechanical part in a modern motor car, noting that the average motor car has SIRO 45,000 individual mechanical parts…..

Anything Else to Consider?

Called From Across the World…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fls-na.amazon-adsyste... (320ms)
googleads.g.doublecli... (270ms)
googlesync.permutive.com (230ms)
hb-api.omnitagjs.com (440ms)
hbopenbid.pubmatic.com (1010ms)
htlb.casalemedia.com (705ms)
ib.adnxs.com (720ms)
id5-sync.com (2015ms)
image2.pubmatic.com (80ms)
image6.pubmatic.com (95ms)
images.taboola.com (145ms)
imasdk.googleapis.com (270ms)
io.narrative.io (15ms)
iris.tv (85ms)
js-sec.indexww.com (65ms)
jsdelivr.net (55ms)
krk.kargo.com (135ms)
la.vid.events.taboola... (100ms)
m7hdh-2damu.ads.tremo... (35ms)
mailonline-us-d.openx... (455ms)
match.adsrvr.org (60ms)
match.prod.bidr.io (150ms)
newzit.com (520ms)
p.rfihub.com (270ms)
pagead2.googlesyndica... (2920ms)
permutive.app (230ms)
pixel-sync.sitescout.com (35ms)
pixel.onaudience.com (440ms)
pixel.quantserve.com (80ms)
pixel.rubiconproject.com (195ms)
pmp.mxptint.net (365ms)
pr-bh.ybp.yahoo.com (85ms)
prebid-server.rubicon... (525ms)
prebid.adnxs.com (115ms)
adservice.google.com (6
csi.gstatic.com (5980ms)
extremereach.io (40ms)
pubads.g.doubleclick.ne
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tag.targeting.unrulym... (
z.moatads.com (20ms)
api.rlcdn.com (80ms)
as-sec.casalemedia.com
id.sv.rkdms.com (90ms)
match.adsrvr.org (40ms)
ssum-sec.casalemedia.c
api.permutive.com (1915
cdn.permutive.com (50m
ib.adnxs.com (90ms)

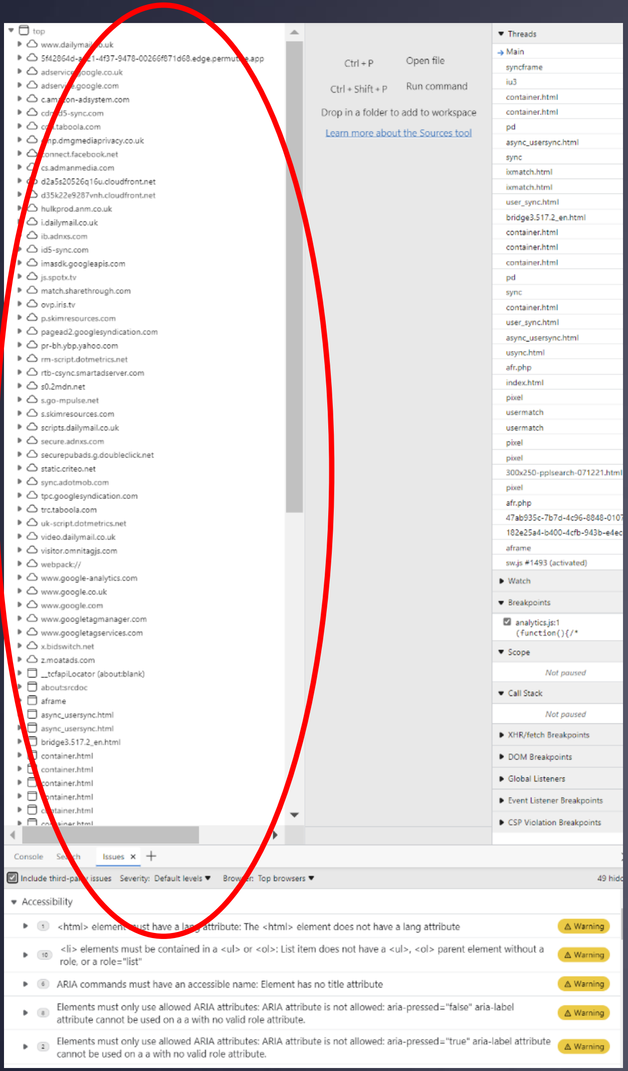
With each request, at the end user device, being a distinct and separate electronic conversation that is encrypted at the “transport layer” level (which is what the acronym “TLS” refers to) and is between the code provider and the end user, but excludes the original site operator.

That also means the introduction, client side, of many, many terms and conditions and many, many pieces of legislation from across the world…

Then that implies a surrendering of control to multiples of coders..

Anything Else to Consider?

Inserted into the end user device



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  adservice.google.co.uk
  adservice.google.com
  c.amazon-adsystem.com
  cdn.id5-sync.com
  cdn.taboola.com
  cmp.dmgmediaprivacy.co.uk
  connect.facebook.net
  cs.admanmedia.com
  d2a5s20526q16u.cloudfront.net
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  ib.adnxs.com
  id5-sync.com
  imasdk.googleapis.com
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  match.sharethrough.com
  ovp.iris.tv
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  rtb-csync.smartadserver.com
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  s.skimresources.com
  scripts.dailymail.co.uk
  secure.adnxs.com
  securepubads.g.doubleclick.net
  static.criteo.net
  sync.adotmob.com
  tpc.googlesyndication.com
  trc.taboola.com
  uk-script.dotmetrics.net
  video.dailymail.co.uk
  visitor.omnitagjs.com
  webpack://
  www.google-analytics.com
  www.google.co.uk
  www.google.com
  www.googletagmanager.com
  www.googletagservices.com
  x.bidswitch.net
  z.moatads.com
  __tcfapiLocator (about:blank)
  about:srcdoc
  aframe
  async_usersync.html
  async_usersync.html
  bridge3.517.2_en.html
  container.html
  container.html
  container.html
  container.html
  container.html
  container.html
```

Ctrl + P Open file

Ctrl + Shift + P Run command

Drop in a folder to add to workspace

Learn more about the Sources tool

```
Threads
  Main
  syncframe
  iu3
  container.html
  container.html
  pd
  async_usersync.html
  sync
  ixmatch.html
  ixmatch.html
  user_sync.html
  bridge3.517.2_en.html
  container.html
  container.html
  container.html
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  sync
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  async_usersync.html
  usync.html
  afr.php
  index.html
  pixel
  usermatch
  usermatch
  pixel
  pixel
  300x250-pplsearch-071221.html
  pixel
  afr.php
  47ab935c-7b7d-4c96-8848-0107
  182e25a4-b400-4cfb-943b-e4ec
  aframe
  sw.js #1493 (activated)
Watch
Breakpoints
  ☑ analytics.js:1
    (function(){/*
Scope
  Not paused
Call Stack
  Not paused
XHR/fetch Breakpoints
DOM Breakpoints
Global Listeners
Event Listener Breakpoints
CSP Violation Breakpoints
```

Console Search Issues × +

☑ Include third-party issues Severity: Default levels ▾ Browser: Top browsers ▾ 49 hidd

Accessibility

- 1 <html> element must have a lang attribute: The <html> element does not have a lang attribute ⚠ Warning
- 10 <li> elements must be contained in a <ul> or <ol>: List item does not have a <ul>, <ol> parent element without a role, or a role="list" ⚠ Warning
- 6 ARIA commands must have an accessible name: Element has no title attribute ⚠ Warning
- 8 Elements must only use allowed ARIA attributes: ARIA attribute is not allowed: aria-pressed="false" aria-label attribute cannot be used on a a with no valid role attribute. ⚠ Warning
- 2 Elements must only use allowed ARIA attributes: ARIA attribute is not allowed: aria-pressed="true" aria-label attribute cannot be used on a a with no valid role attribute. ⚠ Warning

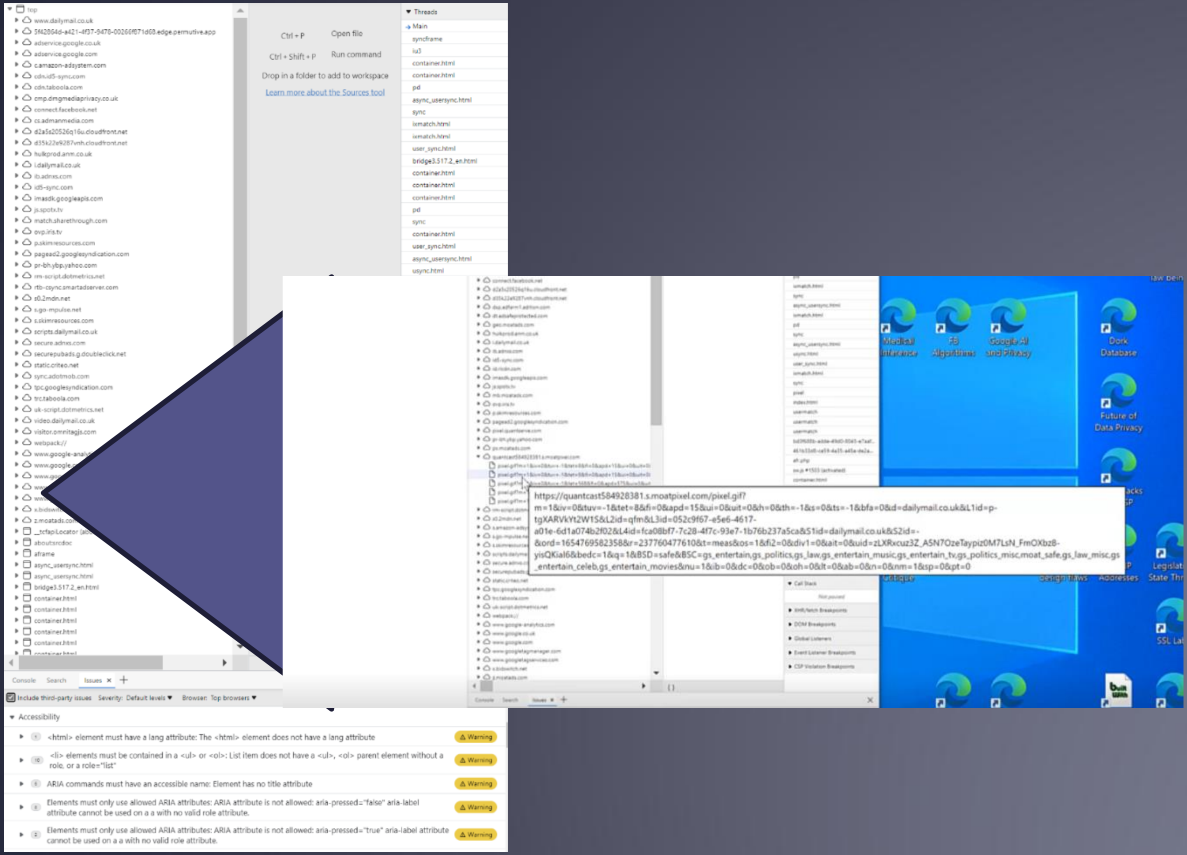
Each with their own terms and conditions applied as a matter of contract…

“open source” does not mean free of responsibility or liability

A legally complex operating environment..

Anything Else to Consider?

Which could be anything..



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  ▶ cdn.id5-sync.com
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  ▶ cmp.dmgmediaprivacy.co.uk
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  ▶ i.dailymail.co.uk
  ▶ ib.adnxs.com
  ▶ id5-sync.com
  ▶ imasdk.googleapis.com
  ▶ js.spotx.tv
  ▶ match.sharethrough.com
  ▶ ovp.iris.tv
  ▶ p.skimresources.com
  ▶ pagead2.googlesyndication.com
  ▶ pr-bh.ybp.yahoo.com
  ▶ rm-script.dotmetrics.net
  ▶ rtb-csync.smartadserver.com
  ▶ s0.2mdn.net
  ▶ s.go-mpulse.net
  ▶ s.skimresources.com
  ▶ scripts.dailymail.co.uk
  ▶ secure.adnxs.com
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  ▶ static.criteo.net
  ▶ sync.adotmob.com
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  ▶ trc.taboola.com
  ▶ uk-script.dotmetrics.net
  ▶ video.dailymail.co.uk
  ▶ visitor.omnitagjs.com
  ▶ webpack://
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  ▶ container.html
```

```
Ctrl + P            Open file
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```

```
▼ Threads
→ Main
  syncframe
  iu3
  container.html
  container.html
  pd
  async_usersync.html
  sync
  ixmatch.html
  ixmatch.html
  user_sync.html
  bridge3.517.2_en.html
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☑ Include third-party issues   Severity: Default levels ▾   Browser: Top browsers ▾
▼ Accessibility
  ▶ 1   <html> element must have a lang attribute: The <html> element does not have a lang attribute   ⚠ Warning
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  ▶ 2   Elements must only use allowed ARIA attributes: ARIA attribute is not allowed: aria-pressed="true" aria-label attribute cannot be used on a a with no valid role attribute.   ⚠ Warning
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https://quantcast584928381.s.moatpixel.com/pixel.gif?
m=1&iv=0&tuv=-1&tet=8&fi=0&apd=15&ui=0&uit=0&h=0&th=-1&s=0&ts=-1&bfa=0&d=dailymail.co.uk&L1id=p-
tgXARVkYt2W1S&L2id=qfm&L3id=052c9f67-e5e6-4617-
a01e-6d1a074b2f02&L4id=fca08bf7-7c28-4f7c-93e7-1b76b237a5ca&S1id=dailymail.co.uk&S2id=-
&ord=1654769582358&r=2377604776108&t=meas&os=1&fi2=0&div1=0&ait=0&uid=zLXRxcuz3Z_A5N7OzeTaypiz0M7LsN_FmOXbz8-
yisQKial6&bedc=1&q=1&BSD=safe&BSC=gs_entertain,gs_politics,gs_law,gs_entertain_music,gs_entertain_tv,gs_politics_misc,moat_safe,gs_law_misc,gs
_entertain_celeb,gs_entertain_movies&nu=1&ib=0&dc=0&ob=0&oh=0&lt=0&ab=0&n=0&nm=1&sp=0&pt=0
```
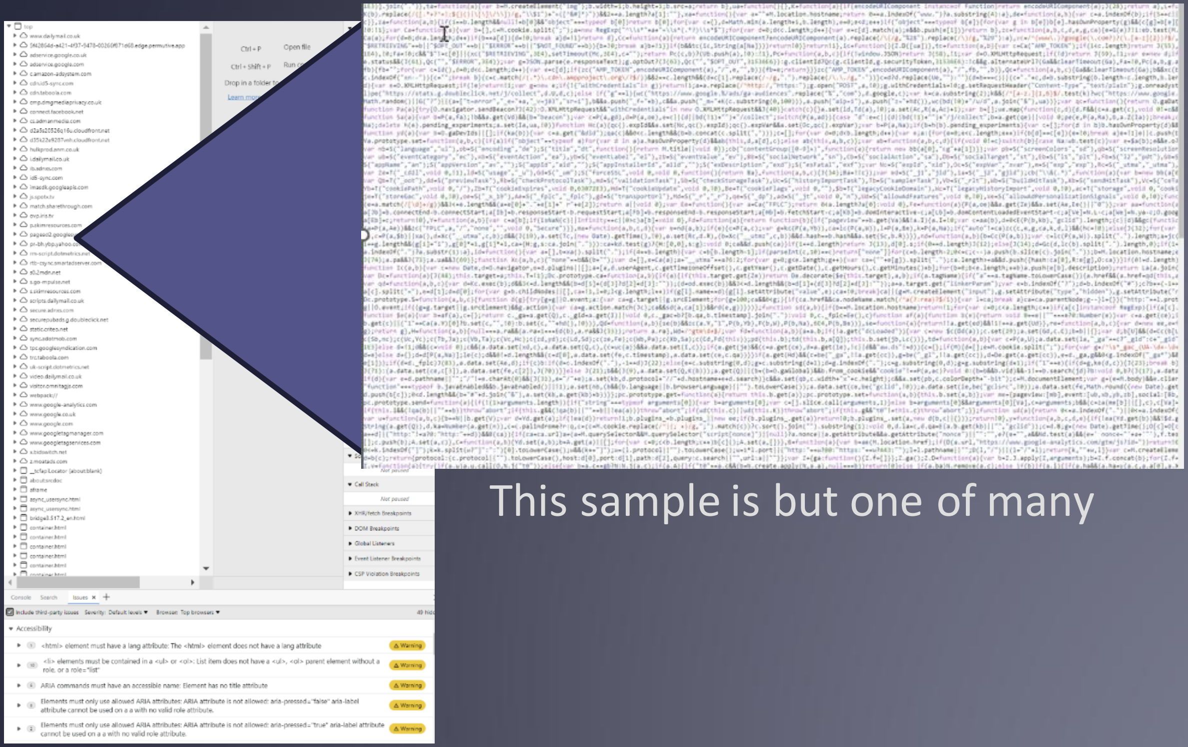

In this case, not code per se, but a beacon, often delivered whether or not there is a “cookie banner”

Which means a loss of control which could be total….

Anything Else to Consider?

With code itself being compressed….



```
▼ top
  ▶ www.dailymail.co.uk
  ▶ 5f42864d-a421-4f37-9478-00266f071d68.edge.permutive.app
  ▶ adservice.google.co.uk
  ▶ adservice.google.com
  ▶ c.amazon-adsystem.com
  ▶ cdn.id5-sync.com
  ▶ cdn.taboola.com
  ▶ cmp.dmgmediaprivacy.co.uk
  ▶ connect.facebook.net
  ▶ cs.admanmedia.com
  ▶ d2a5s20526q16u.cloudfront.net
  ▶ d35k22e9287vnh.cloudfront.net
  ▶ hulkprod.anm.co.uk
  ▶ i.dailymail.co.uk
  ▶ ib.adnxs.com
  ▶ id5-sync.com
  ▶ imasdk.googleapis.com
  ▶ js.spotx.tv
  ▶ match.sharethrough.com
  ▶ ovp.iris.tv
  ▶ p.skimresources.com
  ▶ pagead2.googles
  ▶ pr-bh.ybp.yahoo.co
  ▶ rm-script.dotmetrics.net
  ▶ rtb-csync.smartadserver.com
  ▶ s0.2mdn.net
  ▶ s.go-mpulse.net
  ▶ s.skimresources.com
  ▶ scripts.dailymail.co.uk
  ▶ secure.adnxs.com
  ▶ securepubads.g.doubleclick.net
  ▶ static.criteo.net
  ▶ sync.adotmob.com
  ▶ tpc.googlesyndication.com
  ▶ trc.taboola.com
  ▶ uk-script.dotmetrics.net
  ▶ video.dailymail.co.uk
  ▶ visitor.omnitagjs.com
  ▶ webpack://
  ▶ www.google-analytics.com
  ▶ www.google.co.uk
  ▶ www.google.com
  ▶ www.googletagmanager.com
  ▶ www.googletagservices.com
  ▶ x.bidswitch.net
  ▶ z.moatads.com
  ▶ __tcfapiLocator (about:blank)
  ▶ about:srcdoc
  ▶ aframe
  ▶ async_usersync.html
  ▶ async_usersync.html
  ▶ bridge3.517.2_en.html
  ▶ container.html
  ▶ container.html
  ▶ container.html
  ▶ container.html
  ▶ container.html
  ▶ container.html
```

☑ Include third-party issues Severity: Default levels ▼ Browser: Top browsers ▼ 49 hid

▼ Accessibility

- ▶ 1 <html> element must have a lang attribute: The <html> element does not have a lang attribute ⚠ Warning
- ▶ 10 <li> elements must be contained in a <ul> or <ol>: List item does not have a <ul>, <ol> parent element without a role, or a role="list" ⚠ Warning
- ▶ 6 ARIA commands must have an accessible name: Element has no title attribute ⚠ Warning
- ▶ 8 Elements must only use allowed ARIA attributes: ARIA attribute is not allowed: aria-pressed="false" aria-label attribute cannot be used on a a with no valid role attribute. ⚠ Warning
- ▶ 2 Elements must only use allowed ARIA attributes: ARIA attribute is not allowed: aria-pressed="true" aria-label attribute cannot be used on a a with no valid role attribute. ⚠ Warning

```
[illegible]
```

This sample is but one of many

Which makes it difficult to deconstruct for audit purposes

Anything Else to Consider?

All of it inherently structurally unstable…

BONKERS!

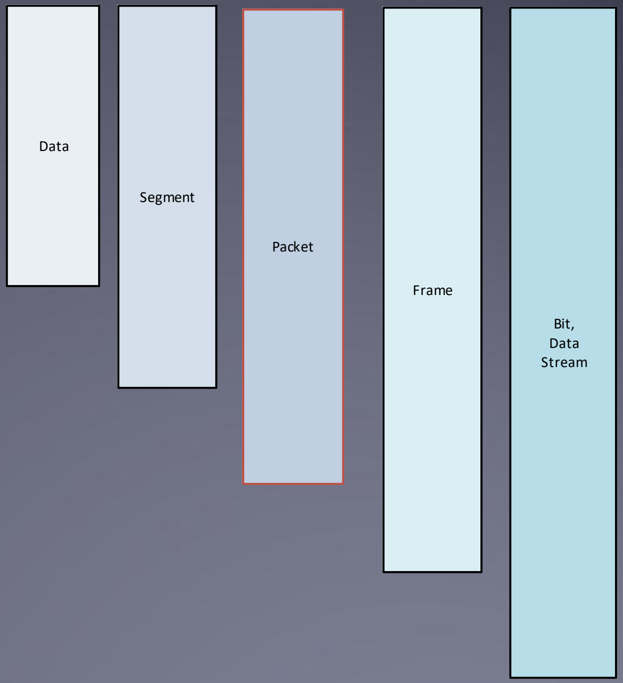
Anything Else to Consider?

The Elephant In The Room: Security

Anything Else to Consider?

The Layers, again….

Application	Application services and protocols	FTP, HTTP, HTTPS etc
Presentation	Data formatting Encryption etc	ANSI/W3C standards
Session	Conversation level controls	Co-ordinated machine to machine resource allocations
Transport	Sequencing of data transfer	Ports, tracert, TLS
Network	Logical addressing	Routing, DNS, TLD
Data	Physical addressing	Bridges, switches etc
Physical	Network topology, physical machines	Screens, keyboards all hardware peripherals etc



What the geek giveth, another geek taketh away. Each level and data transfer form present their own security risks and issues. Some more difficult to implement and defend against than others.

Anything Else to Consider?

The Key Security Decision

The most significant decision, in relation to security, that organisations are likely to take, is their choice of operating system.

Each operating system has its own eco system, object models and more.

As a consequence, each has its own security profile.

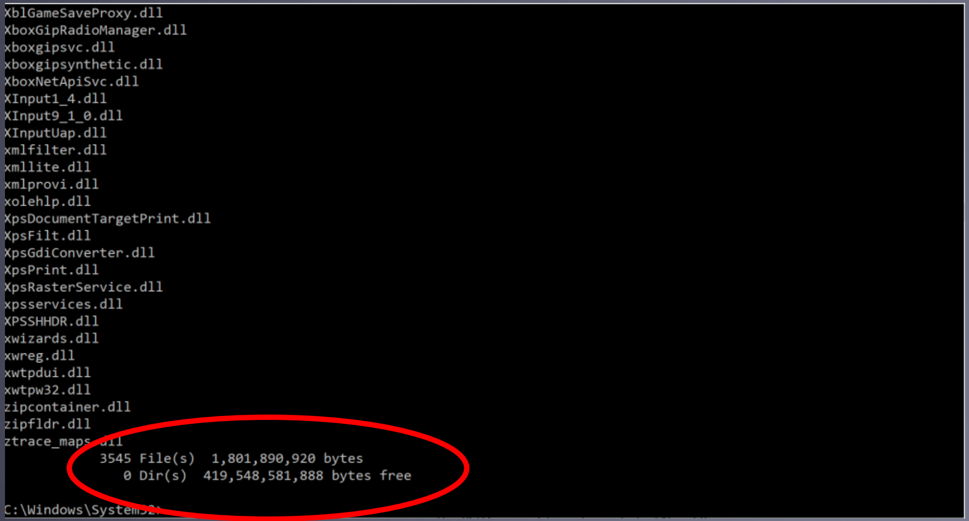
Ideally, client to server, there should be one operating system, organization wide, if only because then the complications of any number of security profiles is removed.

Anything Else to Consider?

As an indication of the security problem..

At just these OSI levels..

Transport	Sequencing of data transfer	Ports, tracert, TLS
Network	Logical addressing	Routing, DNS, TLD
Data	Physical addressing	Bridges, switches etc
Physical	Network topology, physical machines	Screens, keyboards all hardware peripherals etc



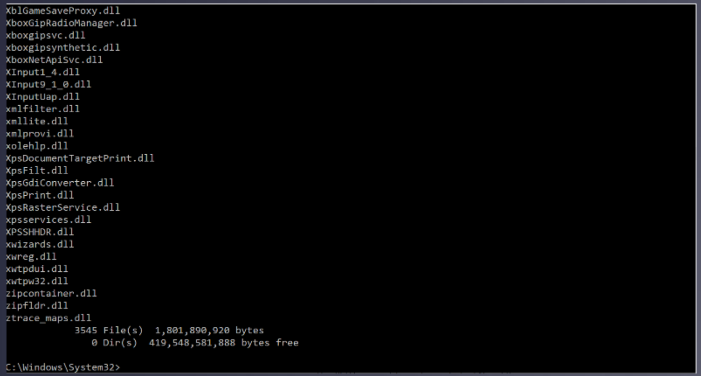
```
XblGameSaveProxy.dll
XboxGipRadioManager.dll
xboxgipsvc.dll
xboxgipsynthetic.dll
XboxNetApiSvc.dll
XInput1_4.dll
XInput9_1_0.dll
XInputUap.dll
xmlfilter.dll
xmllite.dll
xmlprovi.dll
xolehlp.dll
XpsDocumentTargetPrint.dll
XpsFilt.dll
XpsGdiConverter.dll
XpsPrint.dll
XpsRasterService.dll
xpsservices.dll
XPSSHHDR.dll
xwizards.dll
xwreg.dll
xwtpdui.dll
xwtpw32.dll
zipcontainer.dll
zipfldr.dll
ztrace_maps.dll
            3545 File(s)  1,801,890,920 bytes
               0 Dir(s)  419,548,581,888 bytes free

C:\Windows\System32>
```

Each of the files listed is a body of compiled and digitally and digitally signed that can be accessed for utilization purposes if the skills and knowledge are there

Anything Else to Consider?

Do one little thing and….

If the code can be modified… Then re-signed… And redistributed



```
XblGameSaveProxy.dll
XboxGipRadioManager.dll
xboxgipsvc.dll
xboxgipsynthetic.dll
XboxNetApiSvc.dll
XInput1_4.dll
XInput9_1_0.dll
XInputUap.dll
xmlfilter.dll
xmllite.dll
xmlprovi.dll
xolehlp.dll
XpsDocumentTargetPrint.dll
XpsFilt.dll
XpsGdiConverter.dll
XpsPrint.dll
XpsRasterService.dll
xpsservices.dll
XPSSHHDR.dll
xwizards.dll
xwreg.dll
xwtpdui.dll
xwtpw32.dll
zipcontainer.dll
zipfldr.dll
ztrace_maps.dll
            3545 File(s)  1,801,890,920 bytes
               0 Dir(s)  419,548,581,888 bytes free

C:\Windows\System32>
```

The sunburst attack, the hit, an estimated $100bn to the US..

Thankfully such incursions are rare, but nevertheless, the security risk is diverse and clever so…

Anything Else to Consider?

Security Considerations (1)

1.Access control
If threat actors can't access your network, the amount of damage they'll be able to do will be extremely limited. But in addition to preventing unauthorized access, be aware that even *authorized* users can also be potential threats. Access control allows you to increase your network security by limiting user access and resources to only the parts of the network that directly apply to individual users' responsibilities.

1.Anti-malware software
Malware, in the form of viruses, trojans, worms, keyloggers, spyware, and so on, is designed to spread through computer systems and infect networks. Anti-malware tools are a kind of network security software designed to identify dangerous programs and prevent them from spreading. Anti-malware and antivirus software may also be able to help resolve malware infections, minimizing the damage to the network.

2.Anomaly detection
It can be difficult to identify anomalies in your network without a baseline understanding of how that network *should* be operating. Network anomaly detection engines (ADE) allow you to analyze your network so that when breaches occur, you'll be alerted to them quickly enough to be able to respond.

3.Application security
For many attackers, applications are a defensive vulnerability that can be exploited. Application security helps establish security parameters for any applications that may be relevant to your network security.

4.Data loss prevention (DLP)
Often, the weakest link in network security is the human element. DLP technologies and policies help protect staff and other users from misusing and possibly compromising sensitive data or allowing said data out of the network.

Anything Else to Consider?

Security Considerations (2)

1. **Email security**
As with DLP, email security is focused on shoring up human-related security weaknesses. Via phishing strategies (which are often very complex and convincing), attackers persuade email recipients to share sensitive information via desktop or mobile device, or inadvertently download malware into the targeted network. Email security helps identify dangerous emails and can also be used to block attacks and prevent the sharing of vital data.

2. **Endpoint security**
The business world is becoming increasingly *bring your own device* (BYOD), to the point where the distinction between personal and business computer devices is almost nonexistent. Unfortunately, sometimes personal devices become targets when users rely on them to access business networks. Endpoint security adds a layer of defense between remote devices and business networks.

3. **Firewalls**
Firewalls function much like gates that can be used to secure the borders between your network and the internet. Firewalls are used to manage network traffic, allowing authorized traffic through while blocking access to non-authorized traffic.

4. **Intrusion prevention systems**
Intrusion prevention systems (also called intrusion detection) constantly scan and analyze network traffic/packets, so that different types of attacks can be identified and responded to quickly. These systems often keep a database of known attack methods, so as to be able to recognize threats immediately.

Anything Else to Consider?

Security Considerations (3)

1.Network segmentation
There are many kinds of network traffic, each associated with different security risks. Network segmentation allows you to grant the right access to the right traffic while restricting traffic from suspicious sources.

2.Security information and event management (SIEM)
Sometimes simply pulling together the right information from so many different tools and resources can be prohibitively difficult — particularly when time is an issue. SIEM tools and software give responders the data they need to act quickly.

3.Virtual private network (VPN)
VPN security tools are used to authenticate communication between secure networks and an endpoint device. Remote-access VPNs generally use IPsec or Secure Sockets Layer (SSL) for authentication, creating an encrypted line to block other parties from eavesdropping.

4.Web security
Including security tools, hardware, policies and more, web security is a blanket term to describe the network security measures businesses take to ensure safe web use when connected to an internal network. This helps prevent web-based threats from using browsers as access points to get into the network.

5.Wireless security
Generally speaking, wireless networks are less secure than traditional networks. Thus, strict wireless security measures are necessary to ensure that threat actors aren’t gaining access.

Anything Else to Consider?

The Organisation Boundary

Anything Else to Consider?

The Organisation Boundary

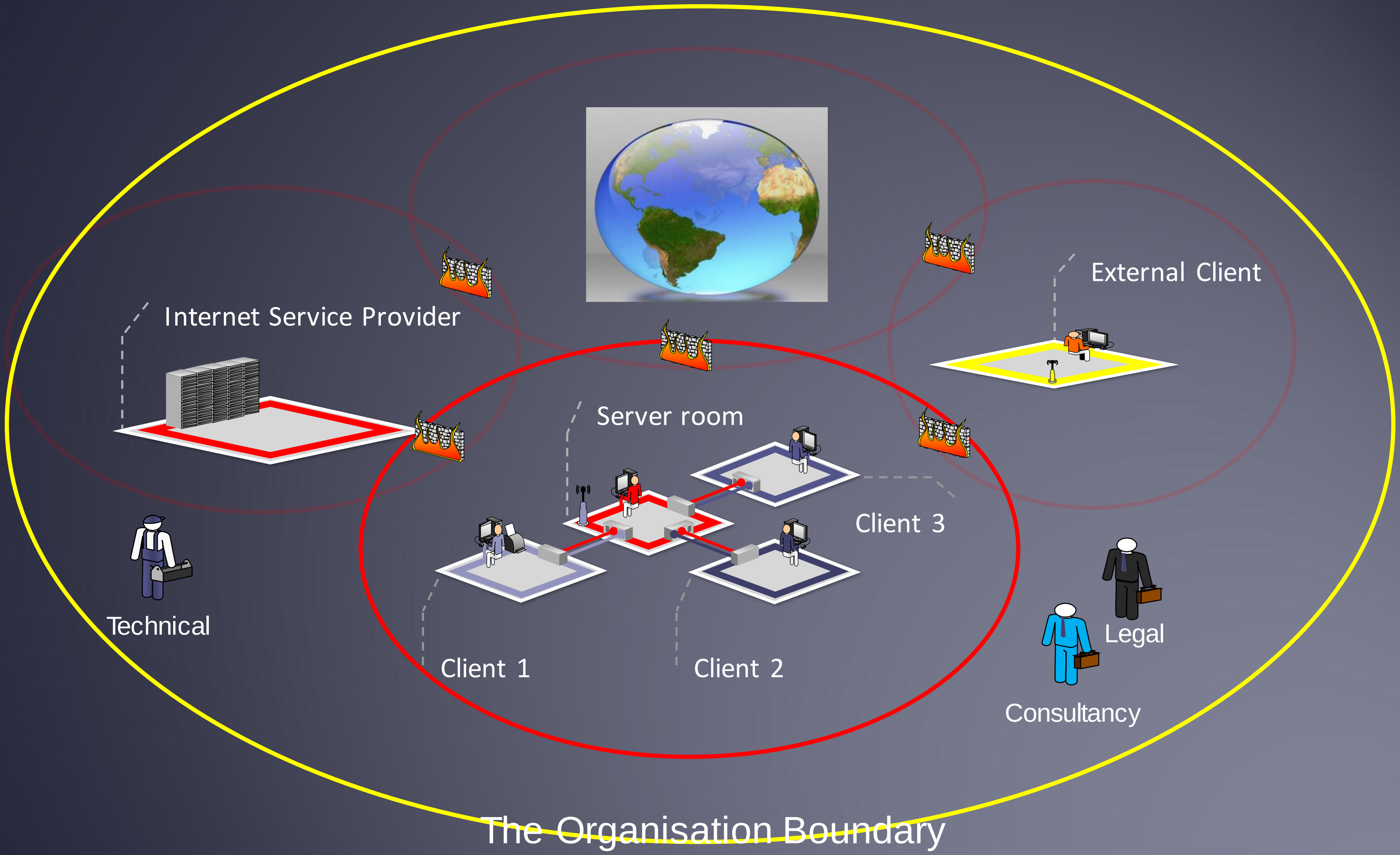
A Fortress is only as strong as its walls and gateways. The gateways being the weakest point.

Nothing should cross you organisation boundary, either way, without the knowledge and acquiescence of the organisation.

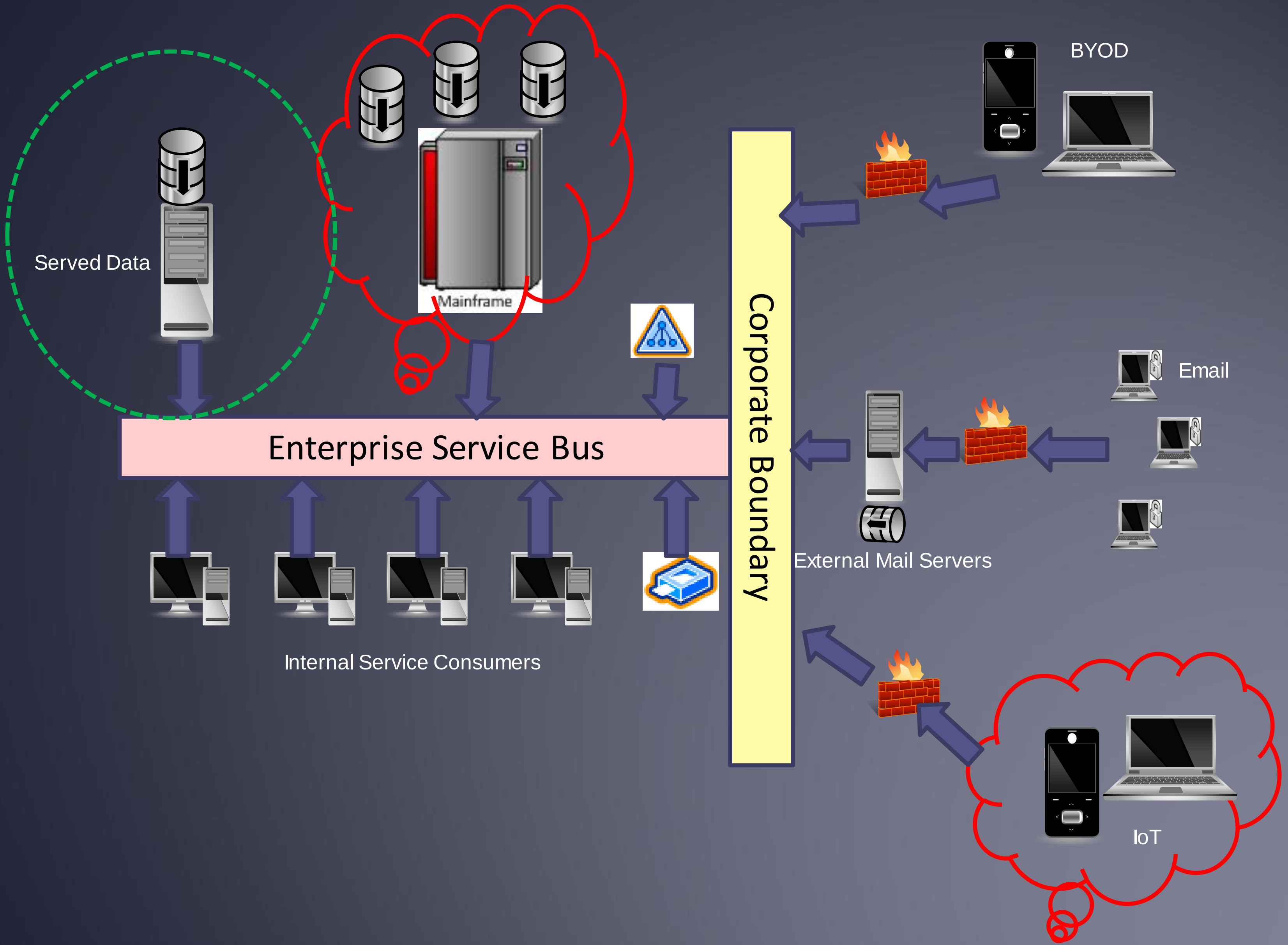
Ownership and its establishment being key, anything the organisation does not own represents a security and audit risk.

The primary risk, of failing to control the boundary is commercial and it is existential.

Anything Else to Consider?



Anything Else to Consider?



Anything Else to Consider?

Documentation

Operating Principles – Sum Up

Code Before Documentation… Yeah Right

As the UK Horizon debacle has demonstrated, the need for documentation is not negotiable.

Documentation, properly executed, is a defence in the case that things go wrong, that best practice of some kind was followed.

Documentation, signed off by the project or programme sponsor, is proof of acceptance into service

Software development is but one of many kinds of activity that need co-ordinating and planning. Without documentation, planning becomes guess work…

A library of templates, each designed to meet the information gathering principles set out in the 4th transition slide deck can be read here

Anything Else to Consider?

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