

XML is Great*

*but I'd rather be coding

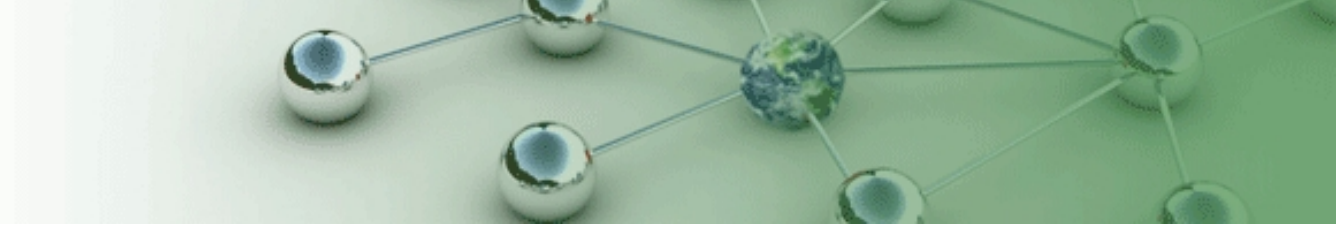
Some Ways of Avoiding Integration Hell

Steve Miller

Product Director, C24

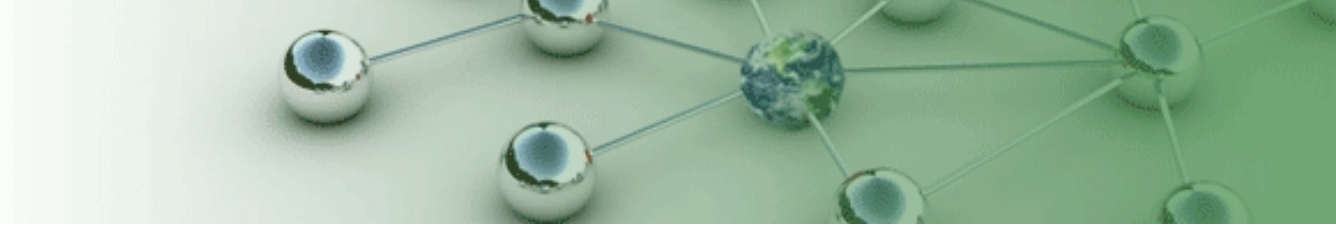
COO, Incept5

- 9th March 2012



- **My name is Steve Miller**

- I'm not the Joker
- I'm certainly not about to Fly Like an Eagle
- I have no desire to Make the World Turn Around
- But I am quite happy to Take the Money and Run
- If you have no idea what any of that was about, you're far too young - come and ask me at the end, or Google "The Steve Miller Band"
 - (I used to work with a guy called Bill Gates, too - imagine the fun *he* had)



- **30 years in software**

- **Astrophysics at university**

- Analysing UV spectral data from the IUE satellite on DEC PDP-11, VAX
- Spectacularly useless preparation for any kind of career

- **Software Technology Ever Since...**

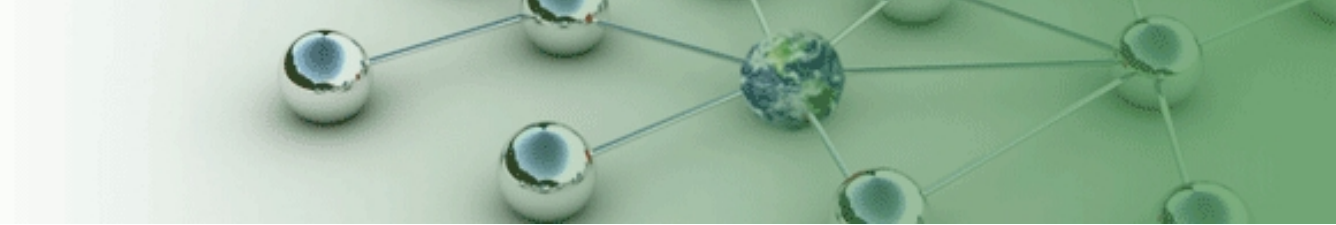
- **Development, Support, Implementation, Solution Architecture, Product Design - International Banking, Treasury, Securities and Capital Markets**

- Started with 9 years on IBM mid-range (RPG)
- 18 years in messaging, middleware, STP and BPM, predominantly in Java since 1999
- Started C24 with 3 colleagues in 2000, sold to Iona in 2007, re-acquired April 2011
- Now...

- Product Director at **C24** (<http://www.c24.biz>)

- COO at **Incept5** (<http://www.incept5.com>)

- In both cases, building solutions to address the really gnarly integration issues that still exist at every level in the financial services world



Alarmism

Integration Problems in Financial Services

Realism

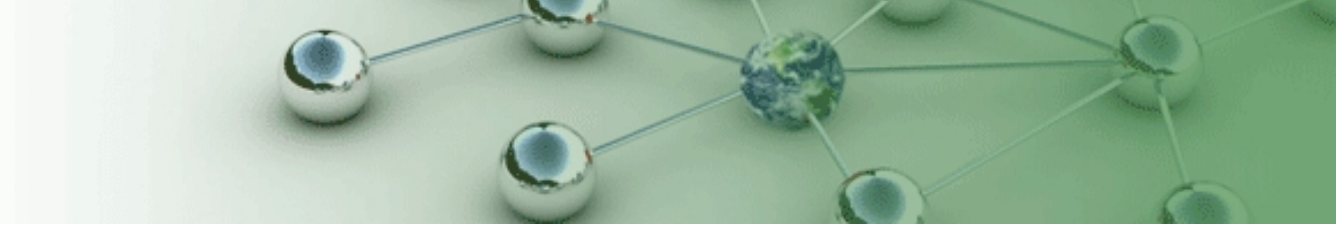
A Detailed Look at the Reasons Why It's So Hard

Optimism

Some Reasons to be Cheerful

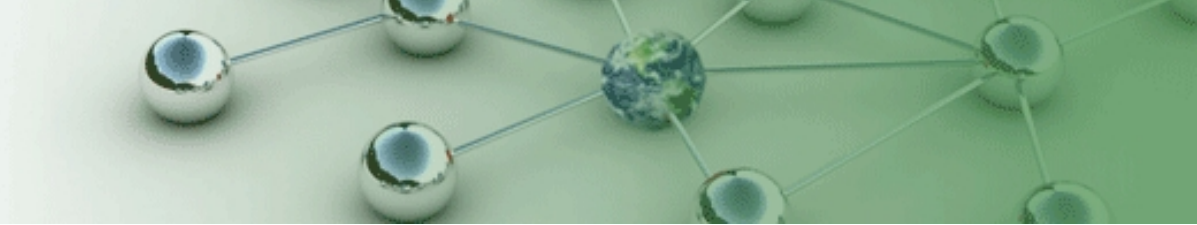
Pragmatism

Code and Examples

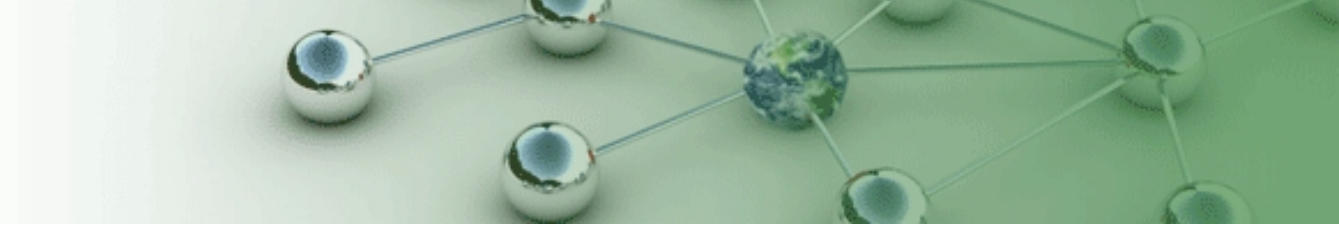


Alarmism

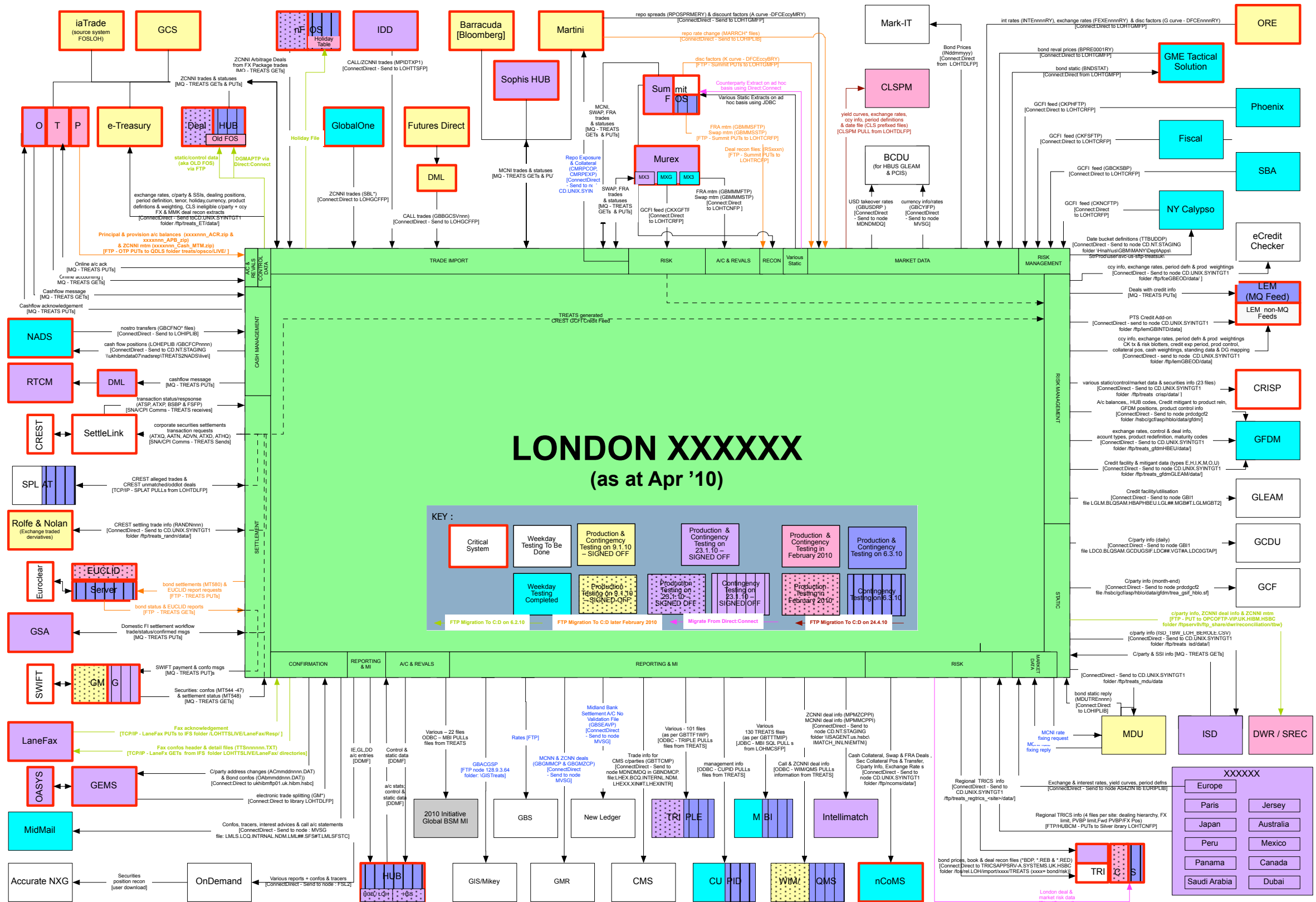
*(Welcome To My World ; Boxes And Arrows
To Put The Fear Of God In You; Why You
Should Keep Your Money Under The
Mattress)*



- **Banks are data-dependent businesses just like any other**
 - Data needs to be exchanged with all manner of internal and external parties
 - Usually securely, reliably, and in some cases in extremely high volumes and at very low latencies
 - The efficiency of data flow within the organisation, and with its external partners, customers and service providers is critical to its overall profitability (and indeed survival)
 - A millisecond can cost you millions
 - A lost trade can lose you your job
 - A corporate action gone missing can mean fines, reputational damage and lost business
 - All of this, in the end, boils down to integration architecture, and we will see why...



Front Office	Sales	Trading	Client Relationship Management	Marketing & Advertising	Product Development	Research	
	Order/Trade Matching	Trade Allocation & Booking	Trade Desk Support	Pricing & Mark-to-Market	Prime Brokerage Support	Risk Control	
Middle Office	Confirmation Generation	Confirmation Matching	Confirmation Exception Management	Interface Management	Priority/Position Management	Queue Management	Exception Management
	Fail Control	Funding	Payments	Billing/Brokerage Fees	Post-Settlement Reconciliation	Collateral Management	Margin
	Securities Borrowing & Lending	Asset Servicing	Safekeeping/Custody	Reference Data	Interest Claims Management	Operations Control	Regulatory & Compliance
	MIS	Complex Products	Process Design	Process Management	Client Services		
	Treasury	Accounting	Management Reporting	Regulatory Reporting			
	Strategic Planning	Budgeting & Forecasting	Product Control	Tax			
Back Office							

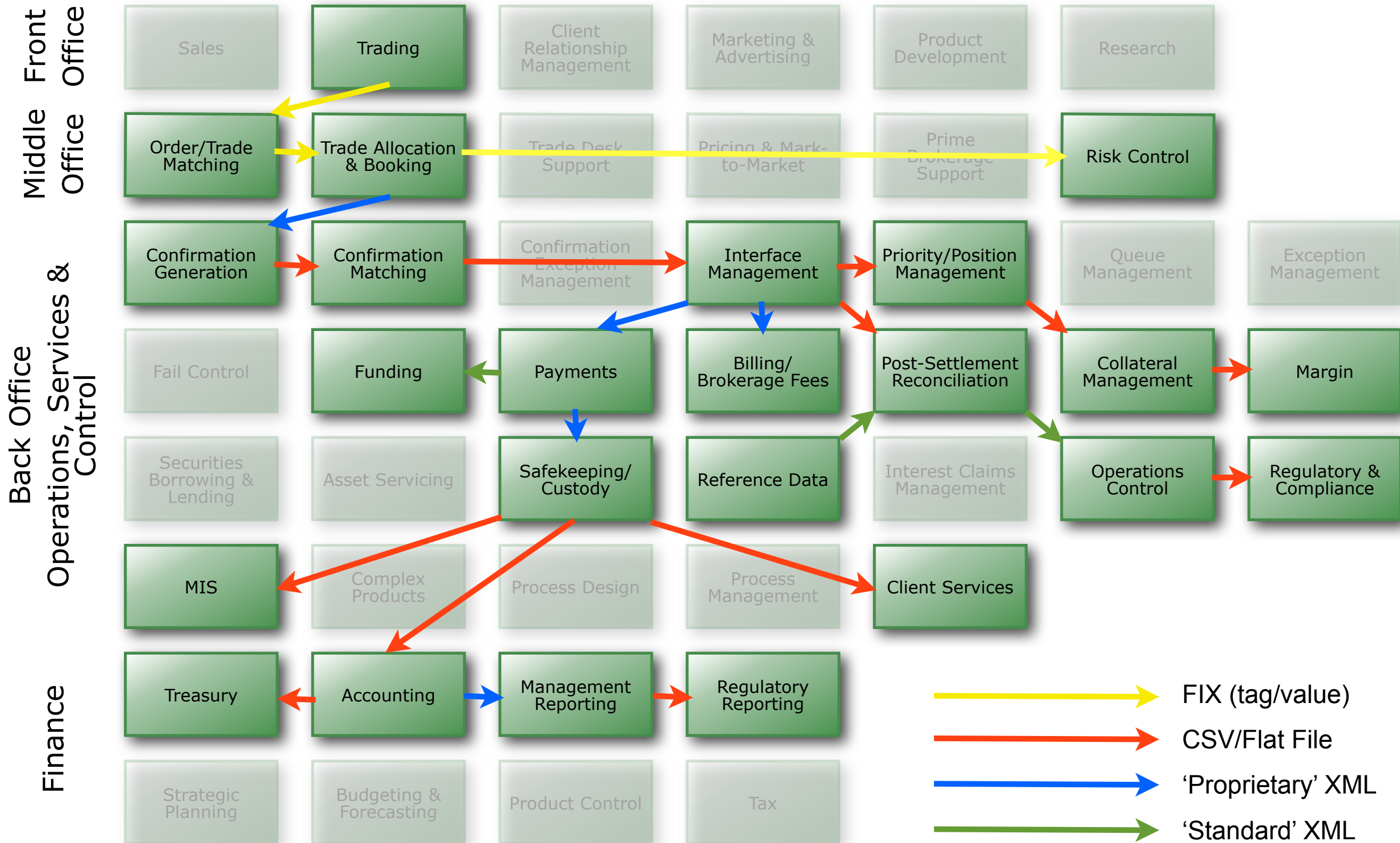


LONDON XXXXXX (as at Apr '10)

KEY :

- Critical System
- Weekday Testing To Be Done
- Production & Contingency Testing on 9.1.10 - SIGNED OFF
- Production & Contingency Testing on 23.1.10 - SIGNED OFF
- Production & Contingency Testing on 23.1.10 - SIGNED OFF
- Production & Contingency Testing on 23.1.10 - SIGNED OFF
- Production & Contingency Testing on 6.3.10
- Weekday Testing Completed
- Production & Contingency Testing on 9.1.10 - SIGNED OFF
- Production & Contingency Testing on 23.1.10 - SIGNED OFF
- Production & Contingency Testing on 23.1.10 - SIGNED OFF
- Production & Contingency Testing on 6.3.10

FTP Migration To C-D on 6.2.10 FTP Migration To C-D later February 2010 Migrate From Direct Connect FTP Migration To C-D on 24.4.10

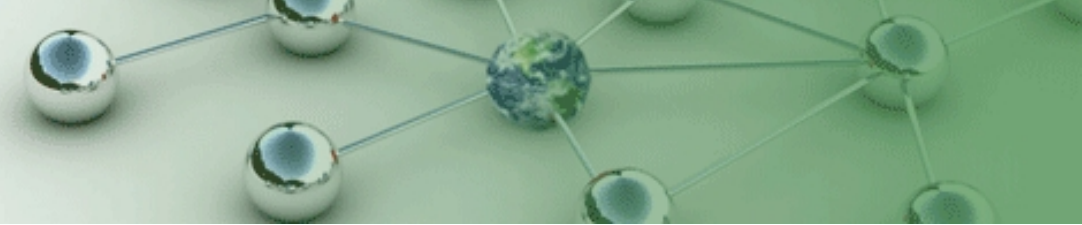


Add in Geography...



US ← → Europe ← → Asia Pac



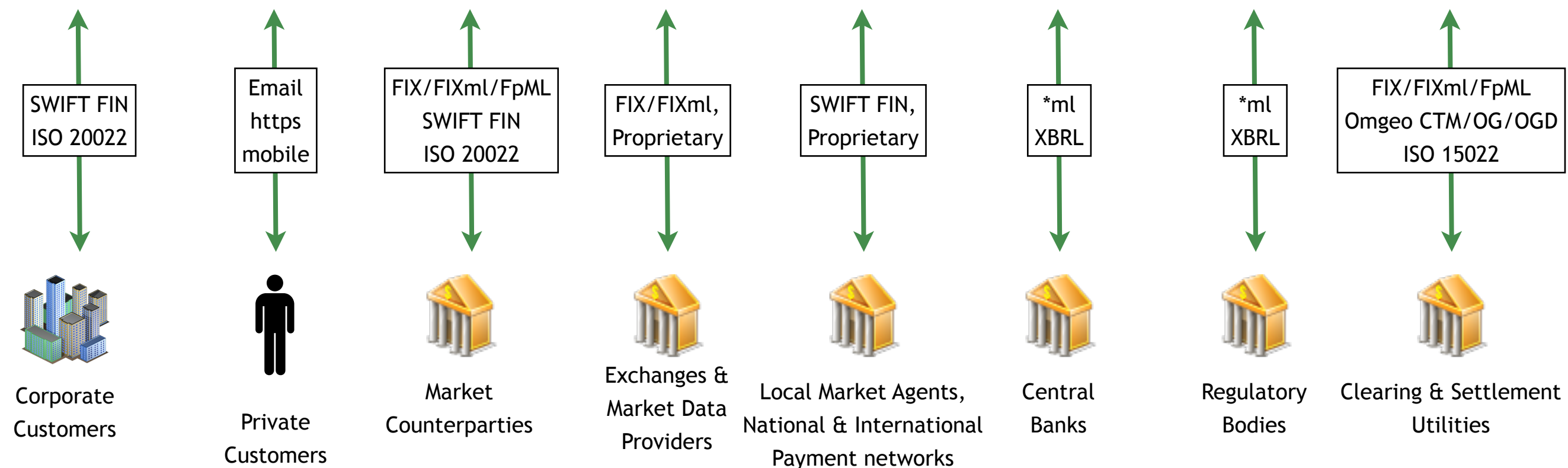


US ←→ Europe ←→ Asia Pac

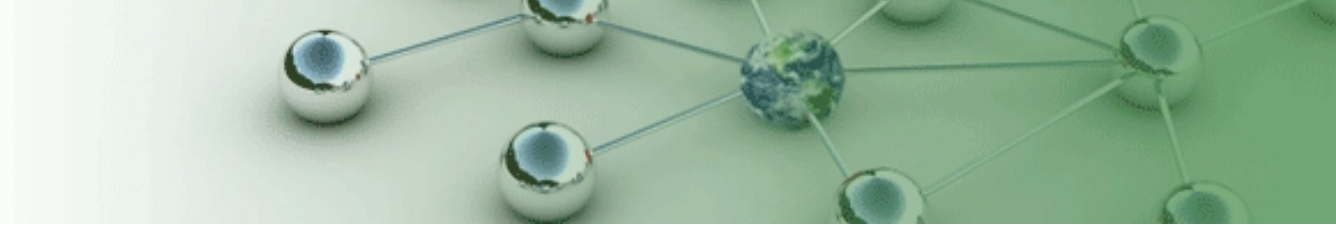


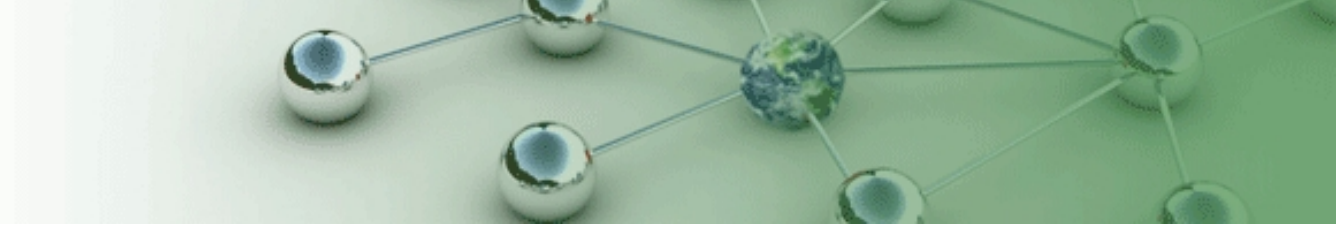


US ←→ Europe ←→ Asia Pac



It Hurts....





● Failure is Rife...But Why?

● Large institutions are generally silo'd

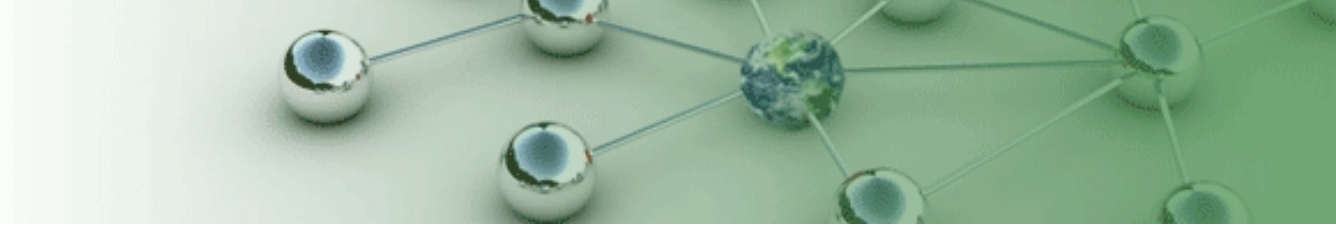
- No coherent integration architecture across product lines or business areas
- Competing political agendas typically overtake what's best for any given project
- Technology platforms and business applications are (of course) extremely diverse

● Agile Adoption is Poor

- Methodologies poorly understood at management level
- Perhaps, not always best explained or presented by advocates
- Teams forced into unrealistic delivery schedules based on management aspiration
- Failure is planned-in

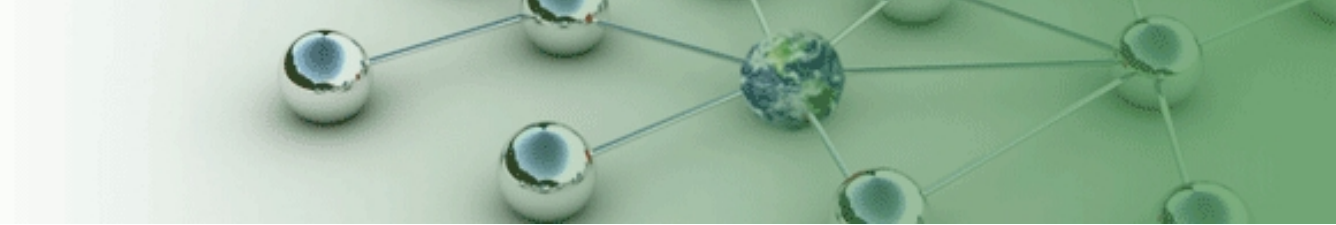
● But Most of All...

- Even today, there is a widespread belief that integration has been 'solved'
- "Isn't it all just messaging...what's so difficult?"

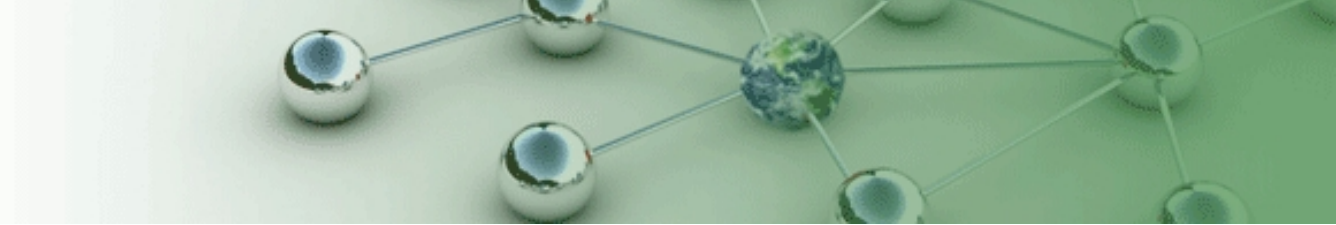


Realism

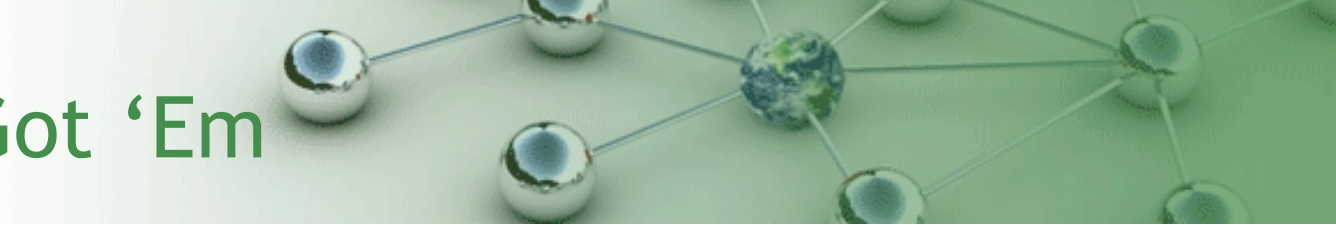
*(XML Isn't Duct Tape; Standards Must Be
Great Because There Are So Many Of
Them ; I Say Tomato, You Say Optional
Repeating Substitution Group)*



- **Having a first-rate SOA or ESB is great**
 - But at the end of the day you still need to understand the messages you're passing around
 - (Actually, you need to understand them round the clock)
 - From Binary (ISO-8583, ASN.1) through CSV and proprietary standards like SWIFT and FIX to more structured models such as ISO-20022, SEPA & FpML
- **The infrastructure and platforms are great (mostly)**
 - We can read a file, listen to a socket or read from a queue, but what is it we're seeing?
 - How do we read in something as simple as a comma-delimited file and treat it the same as an XML document?
 - How do we route it internally based on content, validate it, filter it, enrich it, deliver it to multiple destinations in multiple formats?



- XML syntaxes aren't the answer (although they may be an answer)
 - Technologists use XML, business applications don't understand it
 - Flat files and RDBMS staging are the norm...still
 - Constraint models and validation are rarely used properly
 - Simply enclosing your data in chevron-delimited tags is not using XML
 - Why bother creating a schema if validation is permanently disabled?
 - XML's extensibility can work against it at the tactical level
 - Having an enterprise message model 'based on' FpML, for example
 - All very well if everyone else speaks the same, essentially proprietary, dialect
 - As a wire format, it sucks (in some cases)
 - Marshalling and unmarshalling costs leave it dead in the water in high performance scenarios
 - What's the point of being human-readable if human's aren't supposed to be reading it?
 - On the plus side
 - There are plenty of tools and technologies built to manage it
 - It offers a way of enforcing syntax and data typing, and eases semantic validation
 - Used properly, and appropriately, it can help us, but it isn't a universal band-aid for solving integration problems



- **SWIFT**
 - The daddy of them all in FS, both a network provider (serving 9000+ institutions, handling in excess of 15 million messages per day) and a standards authority
 - Covers interbank and customer payments, treasury, trade finance, securities - SWIFT FIN includes ISO 15022 implementations, SWIFT also carries ISO 20022 traffic and FpML
- **ISO 15022**
 - Covering mainly treasury and the securities markets, implemented by SWIFT but also carried off-network and specialised/ adapted to suit specific needs
- **FIX**
 - Covering all aspects of pre-trade, trade and post-trade communication between market participants, primarily a front- and middle-office tool, exists in multiple 'dialects'
- **FpML**
 - Covering trade information exchange for Interest Rate, FX, Credit, Bond, Equity and Commodity derivatives
- **ISO 20022**
 - UML-modelled standard with an XML implementation - covering Account Management, Administration, Acceptor to Acquirer Card Transactions, Cash Management, Terminal Management, Payments Clearing & Settlement, Payments Initiation, Reference Data, Securities Events, Securities Management, Securities Settlement, Securities Trade, Treasury, Trade Services Initiation, Trade Services Management
- **Endless market- and geography-specific message format standards to deal with:**
 - SEPA, Target2, CREST, Euroclear, DTCC, Omgeo, MDDL, Fedwire...etc.



ISO 20022

```

<!-- xsi:type="http://www.w3.org/2001/XMLSchema-instance xmlns="urn:swift:iso:2002:001:01 -->
<xInstr><Id><TxId>FRTJ123REC2</TxId></Id><SttlmTpAndAddtlParams><SctiesMvmntTp>RECE</SctiesMvmntTp><Pmt>APMT</Pmt>
<adDt><Dt><Dt>2010-01-12</Dt></Dt></TradDt><SttlmDt><Dt><Dt>2010-01-15</Dt></Dt></SttlmDt><DealPric><Tp><ValTp>PAR
<ric></TradDtls><FinInstrmId><Id><ISIN>GB0987654321</ISIN></Id></FinInstrmId><QtyAndAcctDtls><SttlmQty><Qty><FaceA
<d>2225</Id></SfkpgAcct></QtyAndAcctDtls><SttlmParams><SctiesTxTp><Cd>TRAD</Cd></SctiesTxTp><FxStgInstr><Ind>true<
<BICOrBEI>CRSTGB22</BICOrBEI></Id></Dpstry><Pty1><Id><PrtryId><Id>456</Id><Issr>CRST</Issr></PrtryId></Id></Pty1><
<nSttlmDt><Dt><Dt>2010-01-12</Dt></Dt></TradDt><SttlmDt><Dt><Dt>2010-01-15</Dt></Dt></SttlmDt><DealPric><Tp><ValTp>PAR

```

```

.....
:98A::TRAD//20000112
:98A::SETT//20000117
:90A::DEAL//PRCT/101,001283
:22F::PRIC//AVER
:22H::PAYM//APMT
:22H::BUSE//BUYI
:16R:CONFPRTY
:95P::INVE//CHASUS33
:16S:CONFPRTY
:16R:CONFPRTY
:95P::BUYR//MGTCDE55
:16S:CONFPRTY
:16R:CONFPRTY
:95P::SELL//DEUTDEFF
:16S:CONFPRTY
:36B::CONF//FAMT/4000000,
:35B:/GB/345678
:16S:CONFDET
:16R:SETDET

```

FIX 4.4

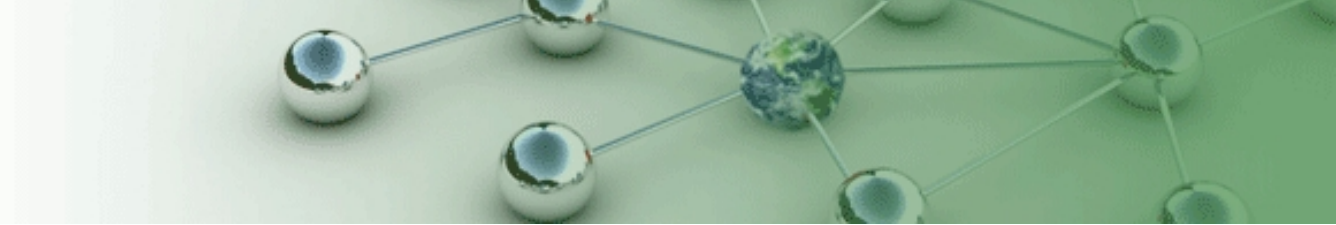
```

8=FIX.4.4 9=1 35=AK 49=STRING 56=STRING 90=1 91=D 34=1 50=STRING 142=STRING 57=STRING 143=STRING
144=STRING 145=STRING 52=20020101-00:00:00.000 122=20020101-00:00:00.000 212=1 213=D 347=ISO-2022-JP
369=1 627=1 628=STRING 629=20020101-00:00:00.000 630=1 664=STRING 772=STRING 859=STRING 666=0 773=2
797=N 650=Y 665=4 453=1 448=STRING 447=B 452=1 802=1 523=STRING 803=1 60=20061122-00:00:00.000
75=20061122 55=BA.L 65=STRING 48=STRING 22=4 454=1 455=STRING 456=1 460=1 461=STRING 167=FAC 762=STRING
200=200201 541=20020101 224=20020101 225=20020101 239=RP 226=1 227=1 228=1 255=STRING 543=STRING 470=AF
471=GB 472=STRING 240=20020101 202=1 947=USD 206=0 231=1 223=1 207=XLON 106=STRING 348=1 349=D 107=STRING
350=1 351=D 691=STRING 667=200611 875=99 876=STRING 864=1 865=99 866=20061117 867=4.300000190734863
868=STRING 873=20061117 874=20061117 80=400 54=2 862=1 528=A 529=1 2 863=200 79=STRING 6=1.5
381=123.44999694824219 118=115.77999877929688 93=6 89=STRING 10=000

```

And your applications probably understand none of these, let alone the fact that each one calls the same thing by a different name, and in many cases uses different coding conventions to do so...

.....
**SWIFT FIN
(ISO 15022)**



- **SWIFT FIN implementation of ISO 15022**

- Party Identifier, Field 95

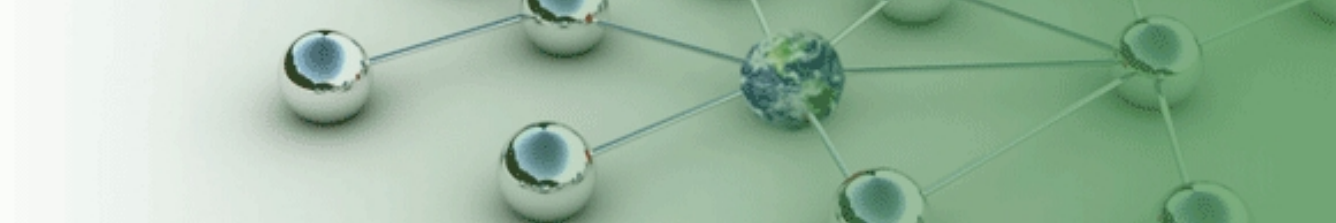
- 95C::PSET//US (A country, using the ISO country code)
- 95P::BUYR//HSBCGB2L (The buyer, specified as a BIC code)
- 95Q::DECU//Name\r\nAddress1\r\nAddress2\r\nAddress3\r\n (Deliverer's Custodian, specified as 4 lines of name and address)
- 95R::REAG/CRST/345 (Receiving Agent, specified as a proprietary code)
- And so on...

- **FIX 4.4**

- 448=HSBCGB2L\u0001447=B\u0001452=3\u0001

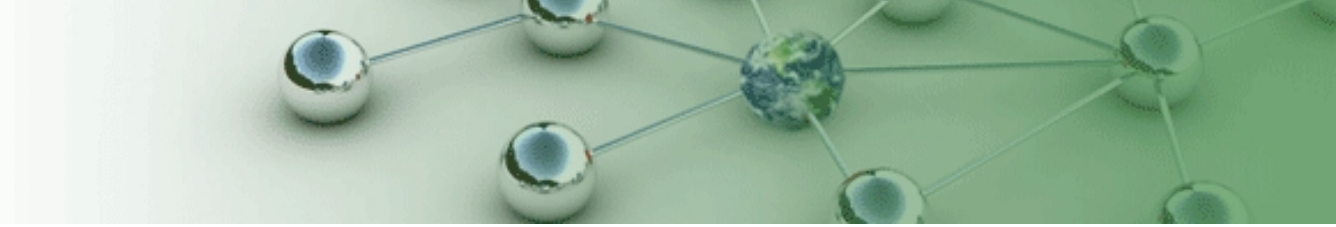
- Translation:

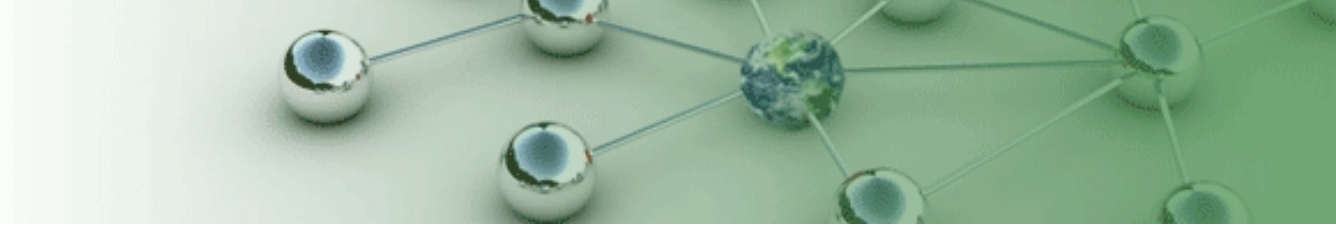
- PartyID=HSBCGB2L
- PartyIDSource=B (BIC code)
- PartyRole=3 (Client ID)



- From SEPA
 - ChequeMaturityDateRule: If ChequeType is present and is DRFT or ELDR, then ChequeMaturityDate is optional. If ChequeType is not present or is different from DRFT or ELDR, then ChequeMaturityDate is not allowed
- From FpML
 - ird-57 (Mandatory): If rollConvention is neither NONE nor SFE, nor a day of the week (MON, TUE, WED, THU, FRI, SAT or SUN) then the period must be M or Y
- From SWIFT
 - MT564 rule C10: If the message is a replacement, an eligible balance notification or a reminder, that is, Function of the Message (field 23G) is REPL, REPE or RMDR, then subsequence A1 (Linkages) must be present at least once in the message, and in one and only one occurrence of A1, field :20C::PREV must be present; consequently, in all other occurrences of A1, field :20C::PREV is not allowed. If the message is a cancellation or a withdrawal that is, Function of the Message (field 23G) is respectively CANC or WITH, then subsequence A1 (Linkages) is optional in the message, and field :20C::PREV may only appear once in only one occurrence of A1; consequently, in all other occurrences of A1, field :20C::PREV is not allowed (Error code(s): E08).
 - *(And that's just one rule, from one message, in one standard...)*
 - *(Oh, and by the way - these change...in some cases at least once a year)*
- *That's why it is difficult...*

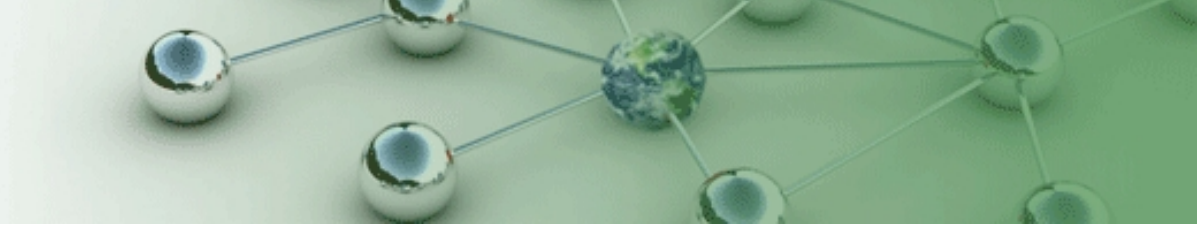
Don't Panic!



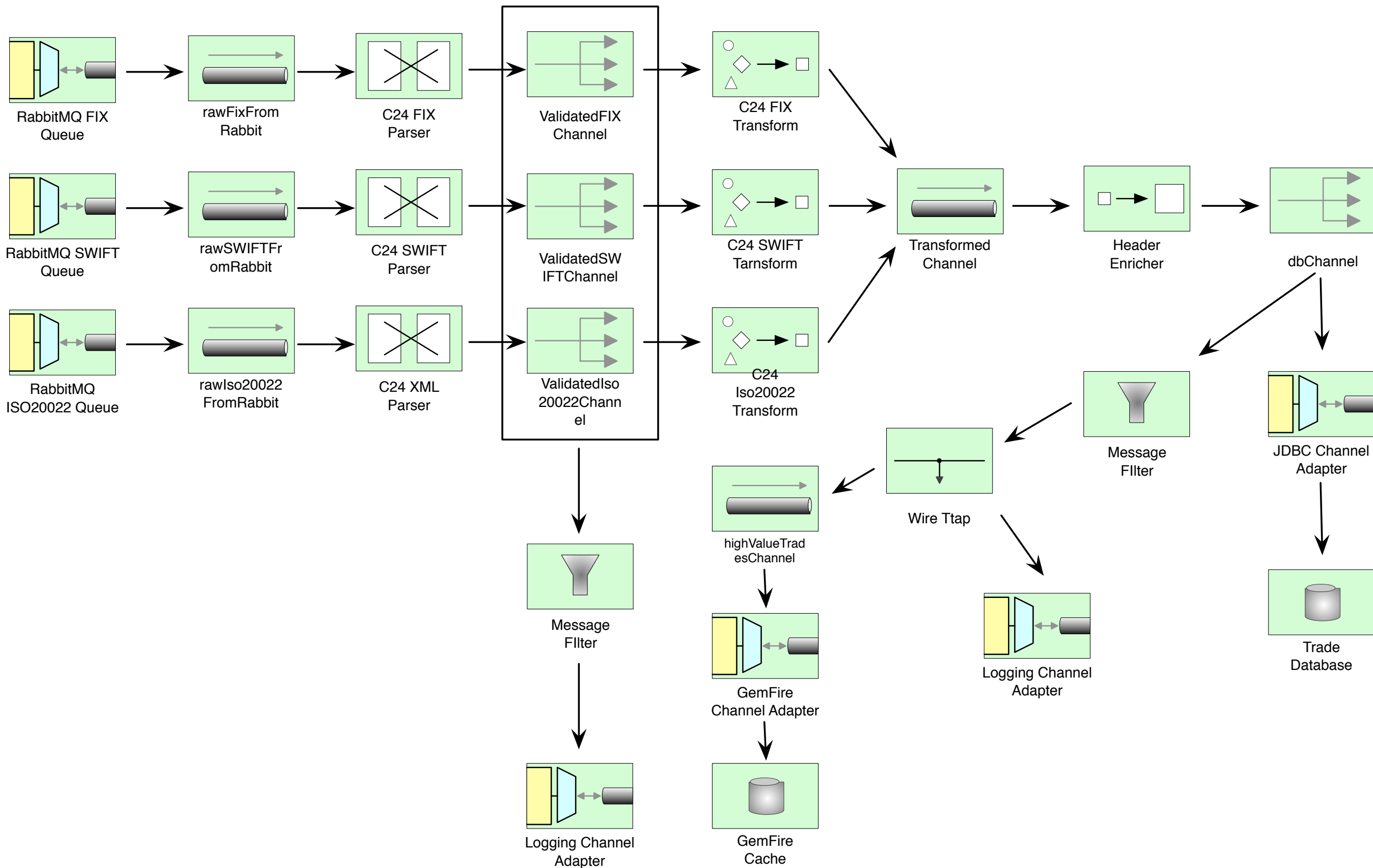


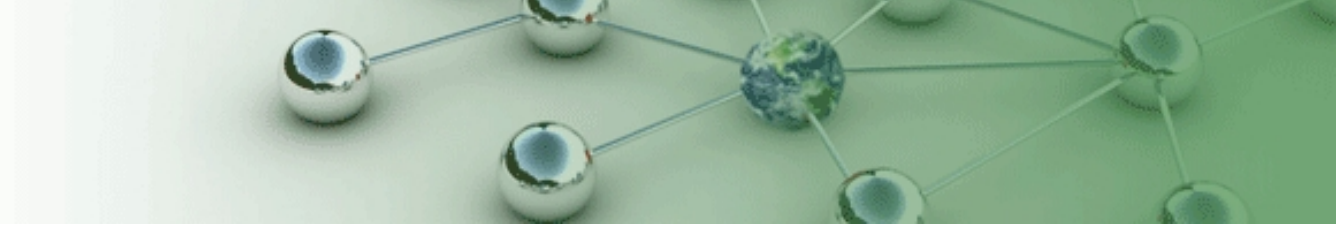
Optimism

*One Spring To Bind Them All; Happiness
Comes In Jar-File-Sized Packages ; A Little
Config Goes A Long Way*



- **Enterprise Integration Patterns**
 - Unsurprisingly, we find application for these just about wherever we look
- **One obvious implementation of these**
 - **Spring Integration**
 - An extension of the Spring programming model
 - Lightweight messaging approach within Spring-based applications
 - Supports integration with external systems via declarative adapters
 - Crucially, because of the first point, a natural fit at enterprise level given the widespread adoption of Spring
- **Message Brokers**
 - Nothing new here - been around for years, but not always as well-integrated with other parts of the stack, well-understood or well-used as they could be
 - Lots to choose from, lots of good work done in the AMQP and JMS worlds
 - Don't need to be heavyweight, or proprietary
- **Java Data Binding Technologies**
 - Castor, JiBX, et. al.
 - (BTW, this is also where we fit in)
 - Free up the developer from coding grunge
 - Promote model-driven architectures
 - Therefore fit naturally in problem areas where data issues dominate



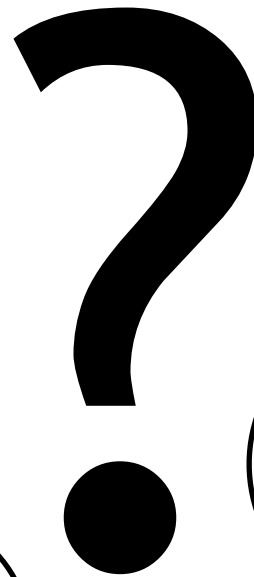


Pragmatism

Talk Is Cheap - Show Me The Code



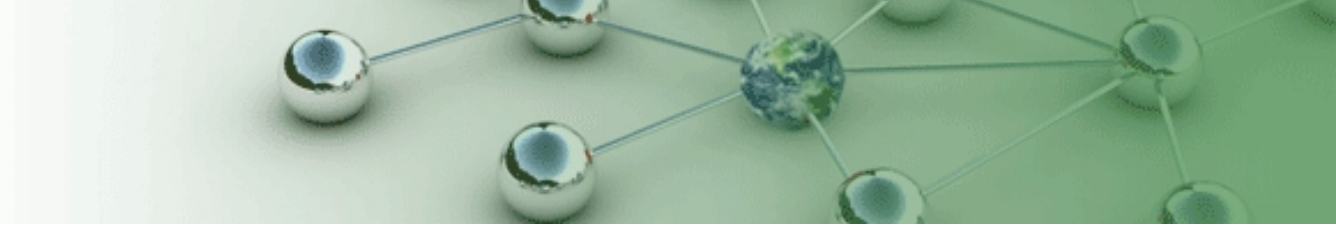
What time was lunch again?



I hope these weren't totally alien concepts



This has given us all something to reflect on



C24
www.C24.biz