BeeCon 2016

amazon web services | Partner Network

CONSULTING PARTNER

Welcome to the jungle!

Alfresco on Amazon Web Services

Robin Bramley

Chief Scientific Officer, Ixxus

ixxus

ixxus

REINVENT YOUR CONTENT

- A Global Platinum-level Alfresco partner
- Working with Alfresco since Alfresco v0.6
- Over 140 Alfresco implementations
- Alfresco & WCM Architecture Design Patterns
- First worldwide implementation of the first Alfresco WCM product in 2007
- Excellent Alfresco knowledge and highly trained and experienced staff
  - Alfresco Certified Engineers and Alfresco Certified Administrators
  - Authoring of leading Alfresco books
  - Alfresco Technical blogs http://www.ixxus.com/blog/
  - Multiple speaking engagements at the Alfresco Conferences (2011-2014) and Alfresco Days
- Alfresco Million $ Club (May 2012) – Only 2 companies awarded
- Alfresco Solution Partner of the Year 2013 and 2014
- Alfresco Best Solution 2015 and Partner of the Year 2015 (Northern Europe)

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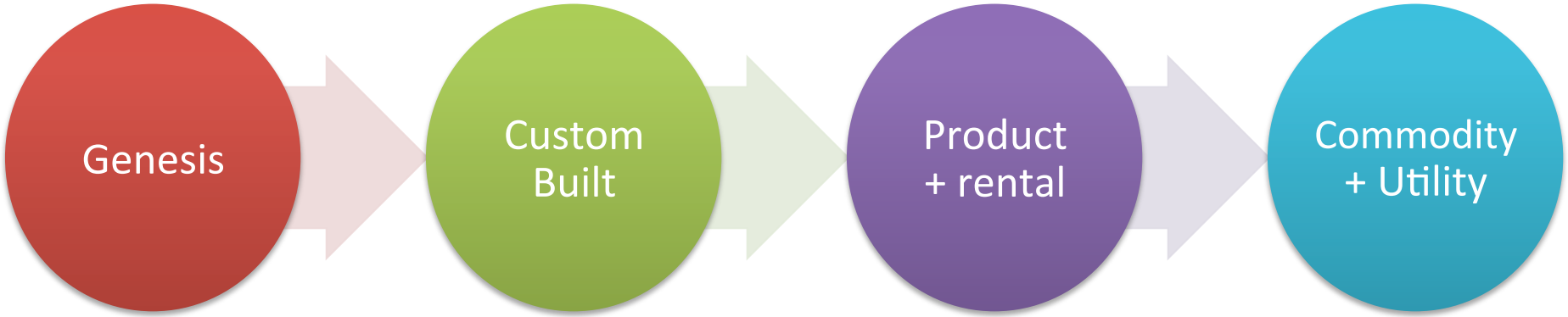
Presented at:

Published in:

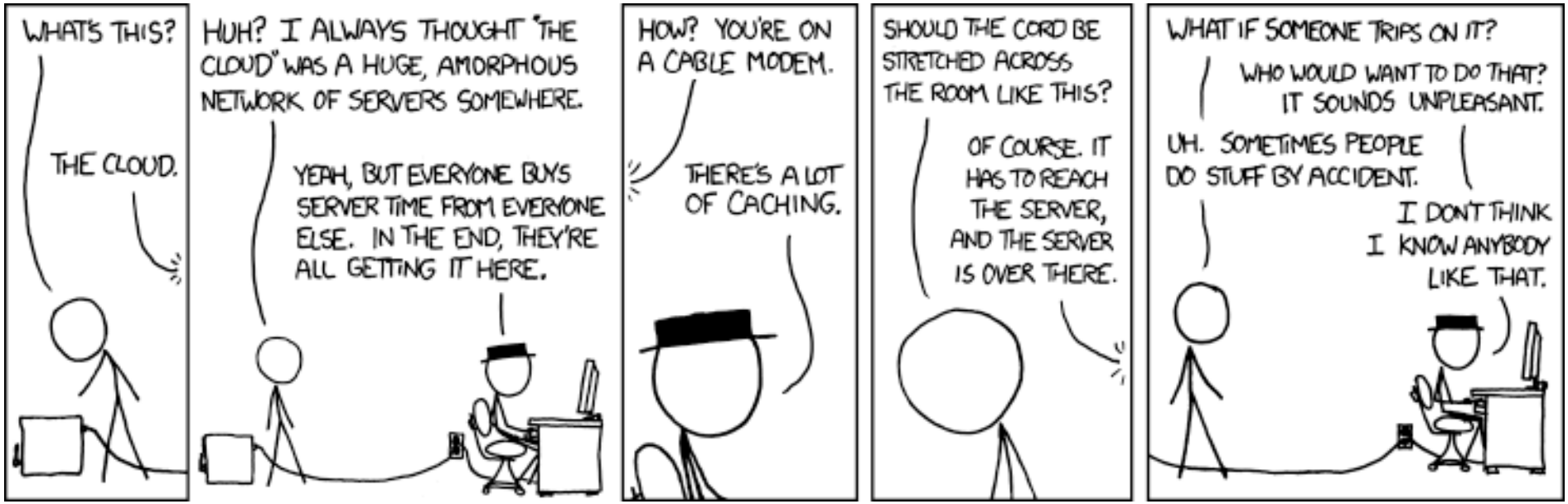
BeeCon 2016

Cloud

Cloud computing was inevitable…
(a side-note on evolution)



IaaS



https://xkcd.com/908/

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A quick AWS primer

VPC

- Foundation of security
- Uses Software-Defined Networking (SDN)
- Allows definition of zones using subnets

Cloud Formation

- The AWS way of treating `Infrastructure as Code`
- Template your stack
- Describes the resources used

```
"Ec2Instance" : {
  "Type" : "AWS::EC2::Instance",
  "Properties" : {
    "SecurityGroups" : [{ "Ref" : "Ec2SecurityGroup" }],
    "BlockDeviceMappings" : [
...
```

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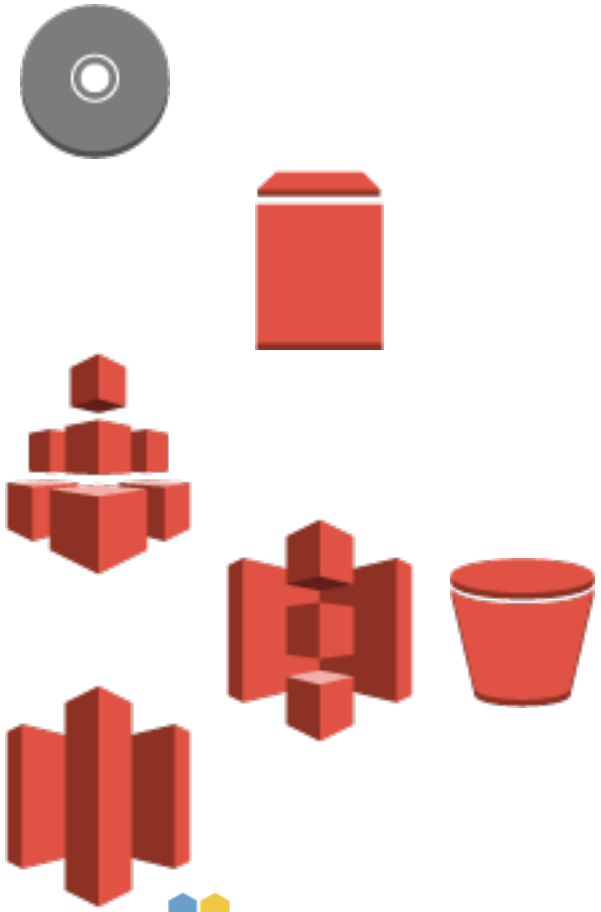
Elastic Compute Cloud (EC2)

- Virtual Server Hosting with resizable compute capacity
- Instance families are optimised for different use cases
  - `M3` class (Ivy Bridge / Sandy Bridge) has SSD storage
  - `M4` class (Haswell) is EBS only
  - `xlarge` has 4 vCPU → Alfresco Enterprise unit
- Load balance with ELB

Storage

- Ephemeral
- EBS
- EFS (*preview*)
- S3
- *Glacier*



RDS

- Managed Databases

- Multi-AZ (Availability Zone)

SES

- Simple Email Service
- Don’t bother with your own SMTP relays

CloudHSM

- **Hardware** Security Module
  - Appliances wired into a VPC
  - Not instantly provisioned
- Useful for master keys
  - E.g. RSA Private Key
- SafeNet Luna SA
  - JCE provider
  - Keys do not leave the hardware

Direct Connect

- Leased line connectivity
  - E.g. for England
    - Leased line to Docklands
    - Backhaul to AWS Ireland
- Reduced contention with Internet traffic!

Import/Export

- Introduced in 2009
- Send your 2TB disk packs to AWS
- Can be encrypted using TrueCrypt
- Contents copied to S3
- Returned by Courier

Snowball

- 50TB rugged, luggable disk pack
- Encrypted
- Copied to S3
- Amazon-owned
- Wiped to NIST SP 800-88 guidelines

October 2015

Case study

Migrating to Alfresco on AWS

- Top 20 global publisher
  - $1.5 billion revenue (2014)
  - 5,500 employees across 20 countries worldwide
- Programme involved several streams
  1. Major on-premises DAM replacement
  2. Rich Media
  3. Encryption at rest
  4. Reconciliation

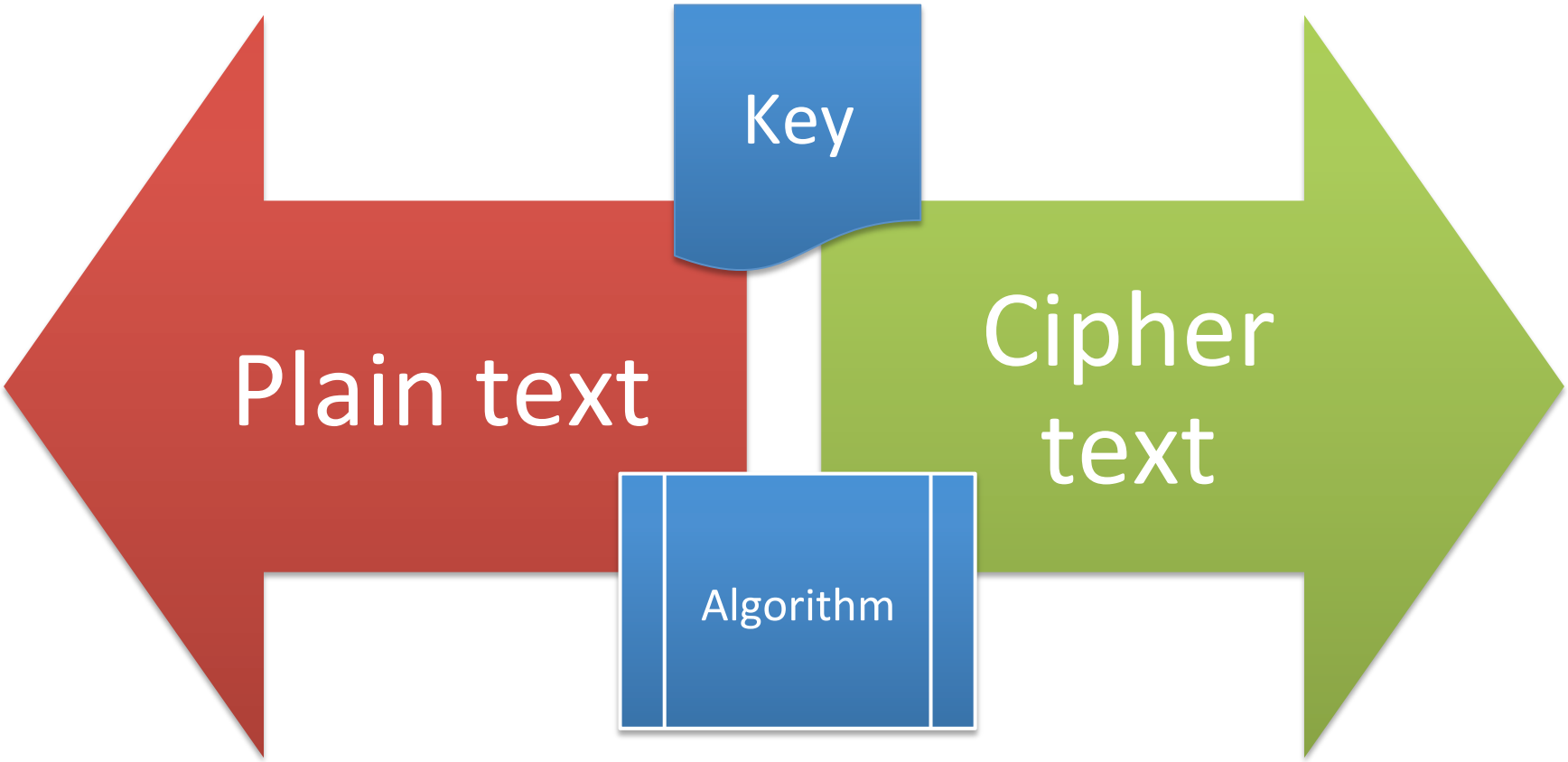
Migration

Migration

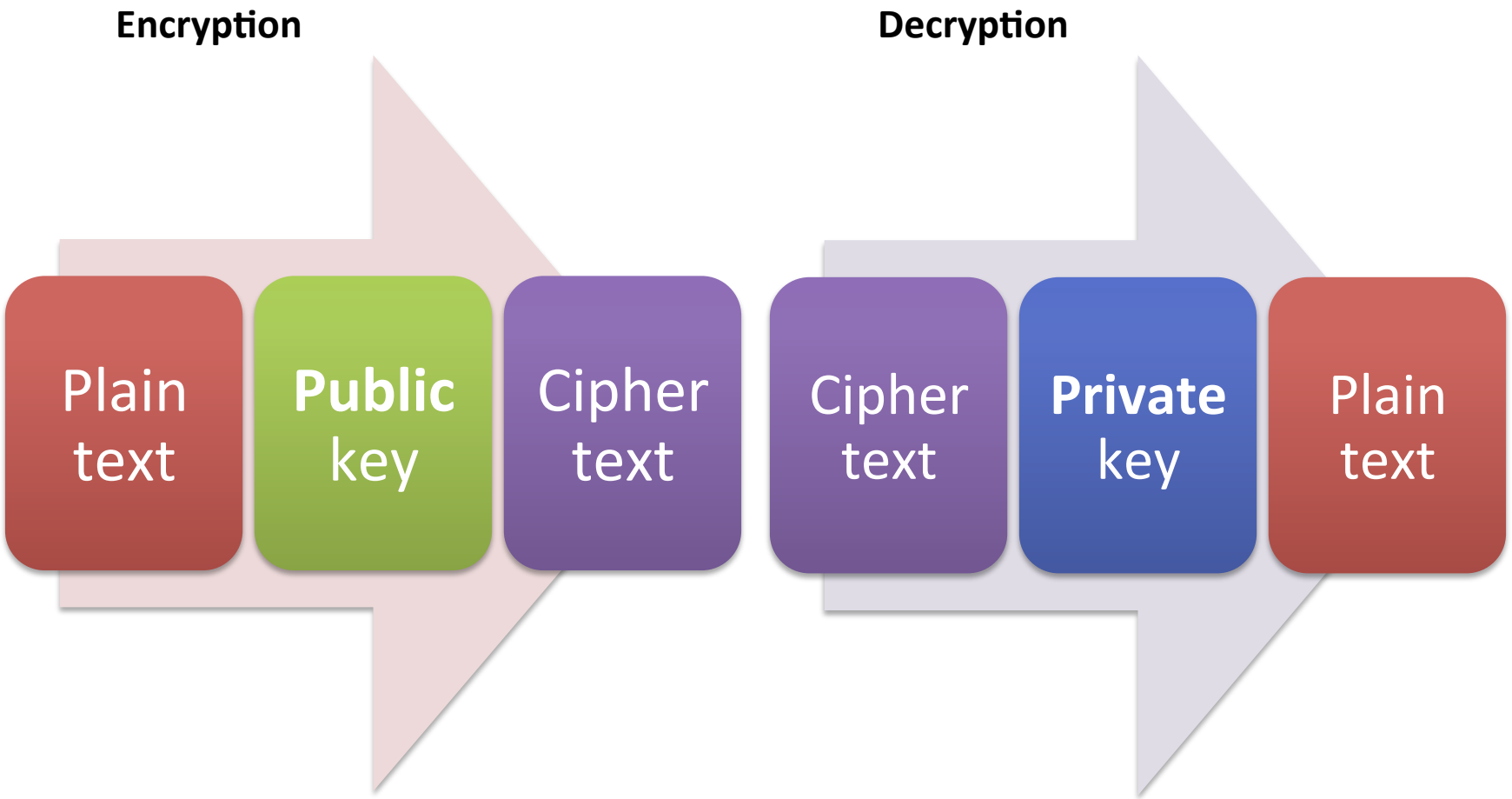
- Higher Education print archive contained:
  - 85,000 products
  - ~1.8 million assets
  - ~35 TB of files

Encryption at rest

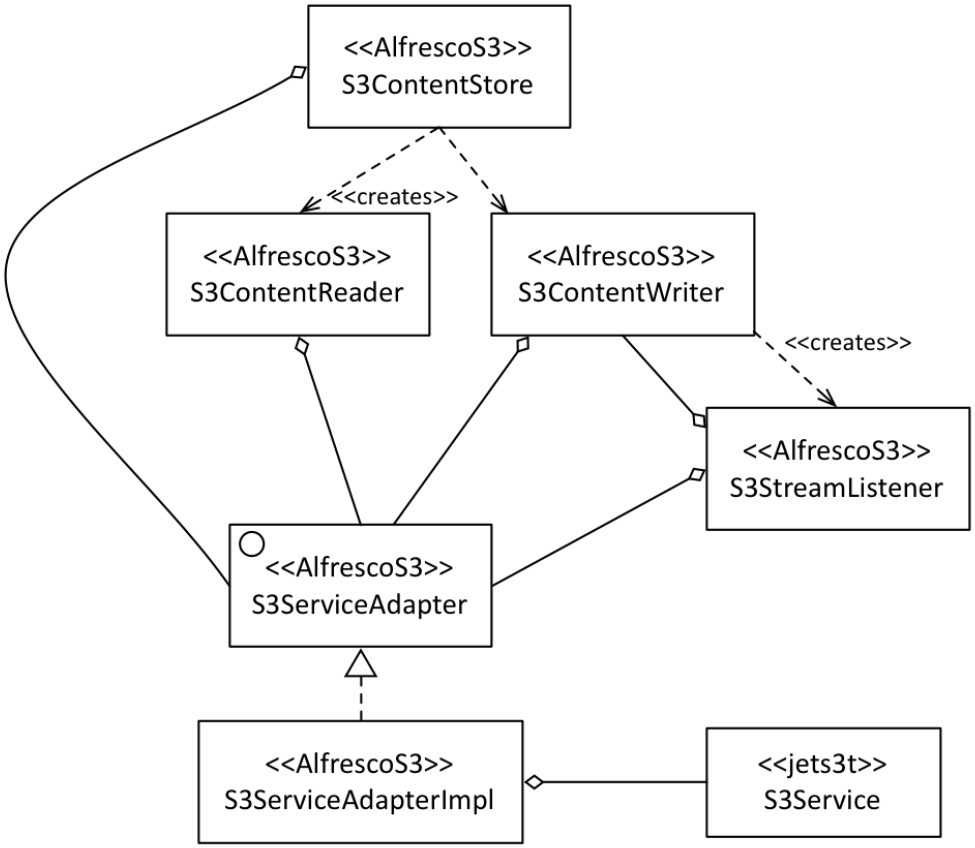
Symmetric encryption



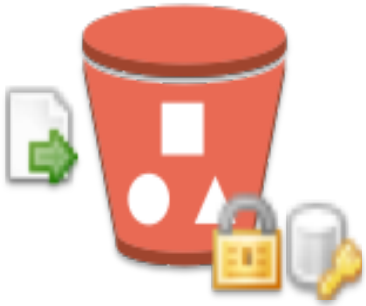
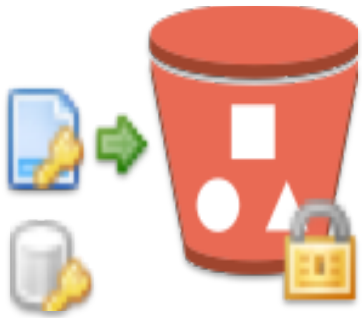
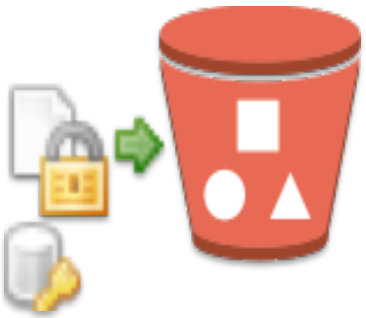
Public-key cryptography



S3 Connector classes



S3 encryption options

Unencrypted	Server-Side Encryption (SSE)	SSE-C	Client-Side Encryption (CSE)
			
	• **Encryption:** AWS • **Key management:** AWS	• **Encryption:** AWS • **Key management:** Customer	• **Encryption:** Customer • **Key management:** Customer
Alfresco Enterprise S3 Connector	Alfresco Enterprise S3 Connector	No offering!	Alfresco Cryptodoc

OWASP Cryptographic Storage rules

① Only use **strong** cryptographic algorithms

② **Store keys away from the encrypted data**

③ Use **independent keys** when multiple keys are required

④ Protect keys in a key vault

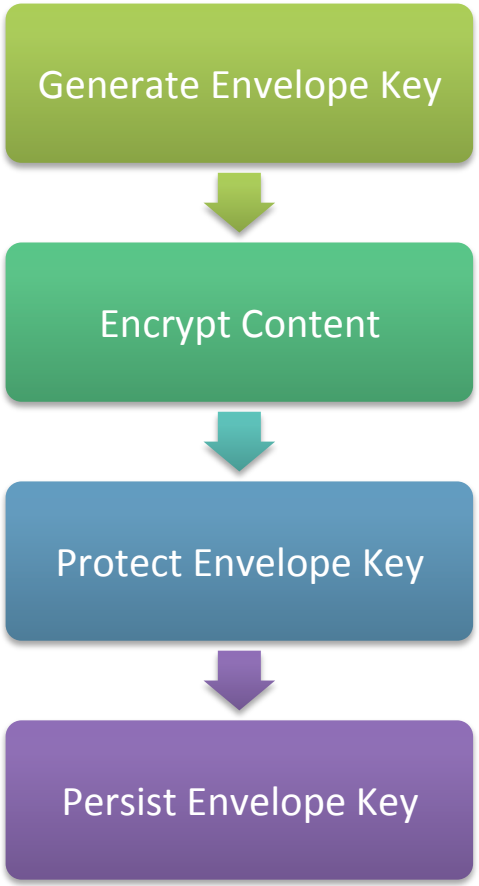
⑤ Key substitution

i. Build support for **changing keys** periodically

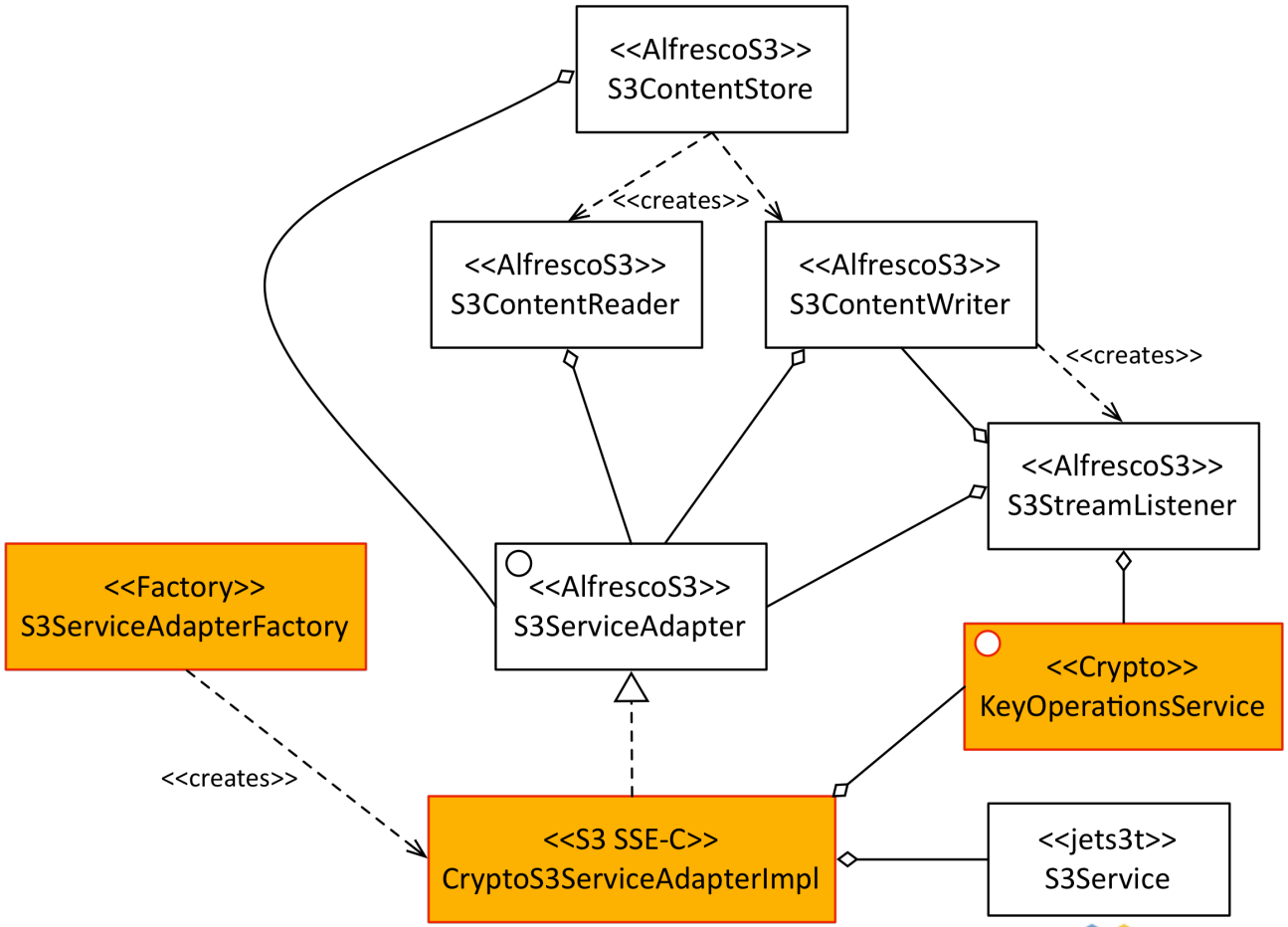
ii. Rekey data at least every one to three years

Envelope Encryption

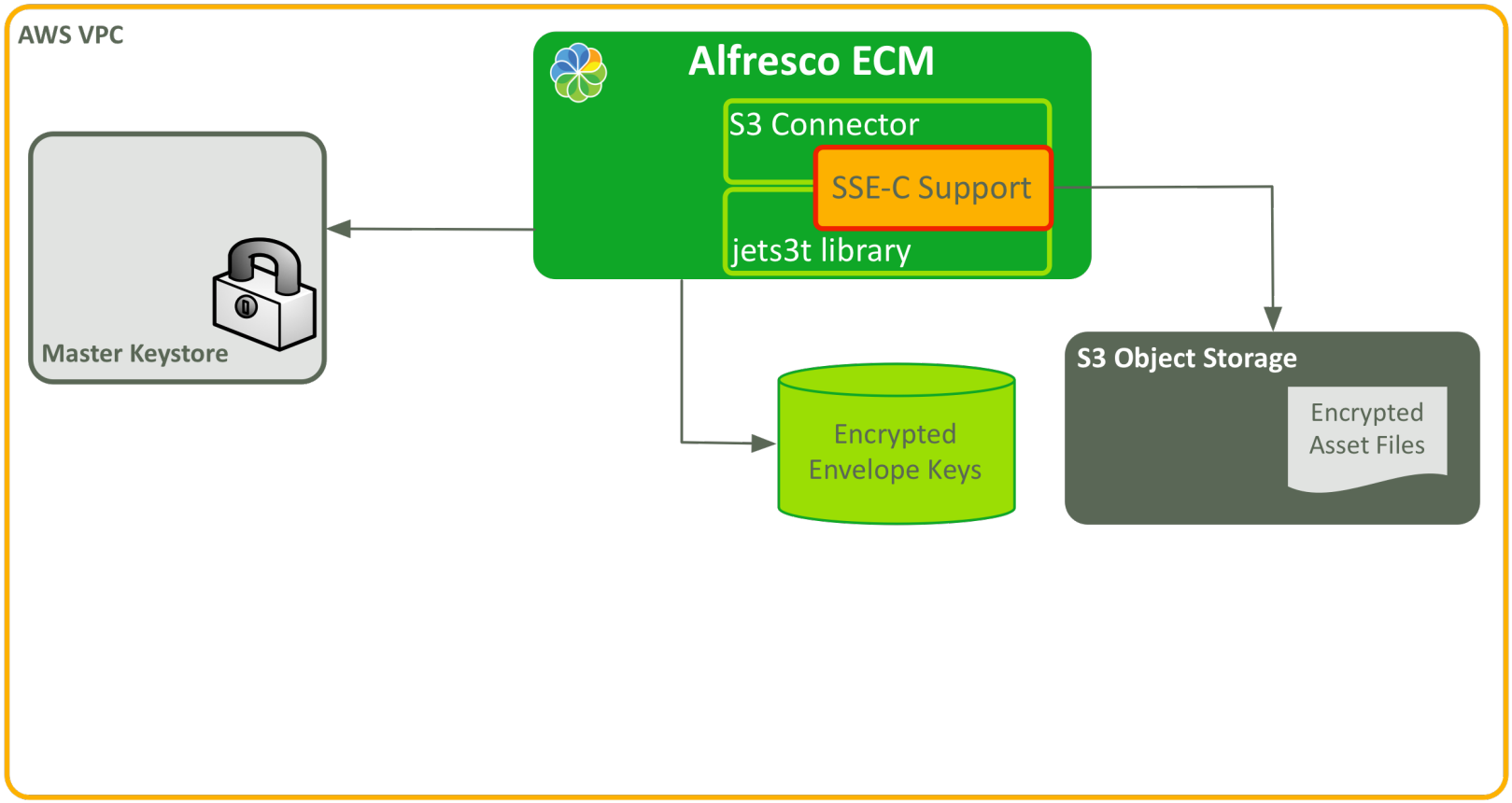
- Symmetric (secret key) encryption is fast
  - More suitable for encrypting content
- Asymmetric (public key) encryption is strong
  - Decryption is slower
- Envelope encryption uses separate keys
  - Envelope (data) keys
  - Master keys



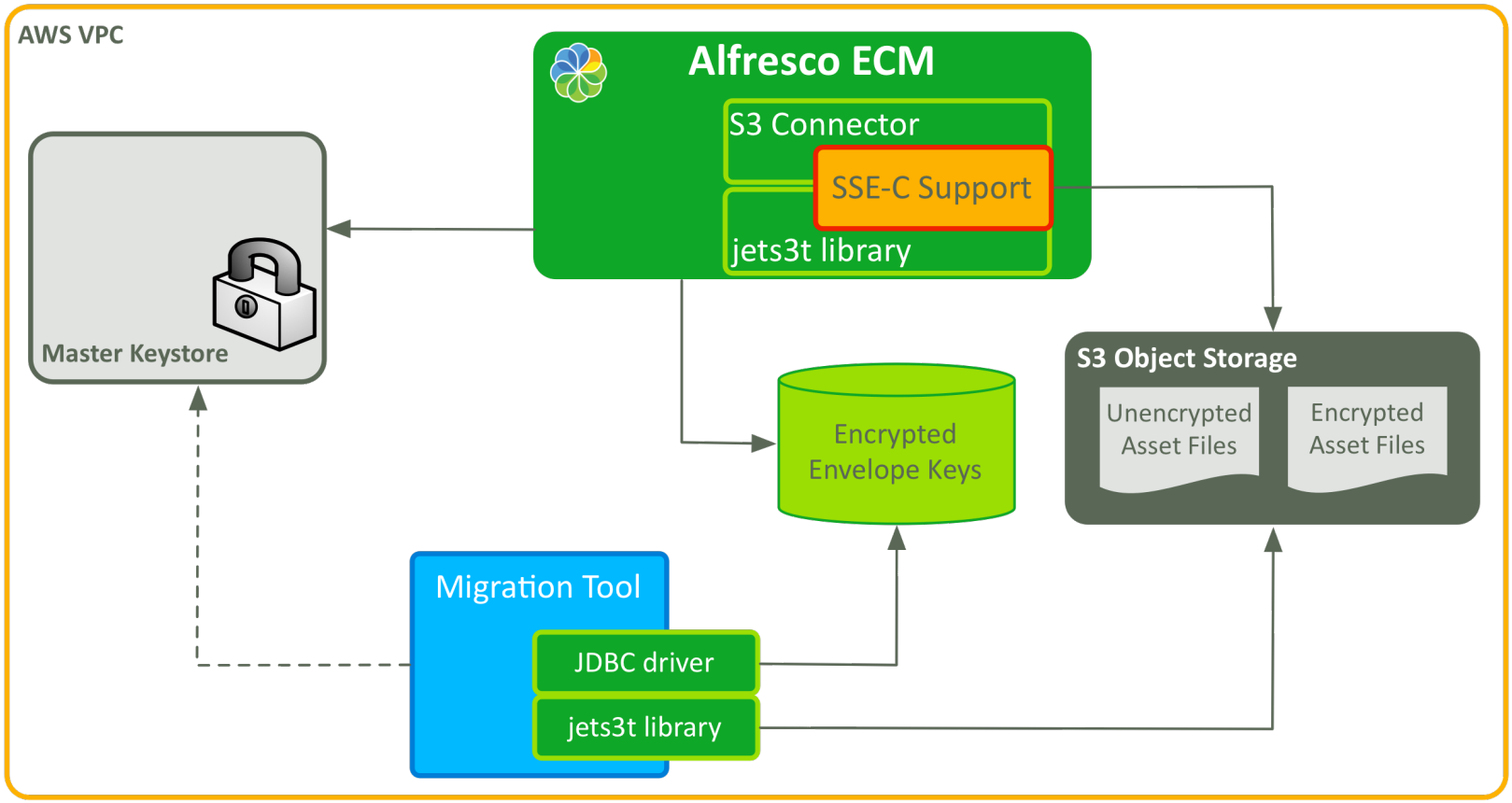
S3 Connector modifications



Encryption at rest



Encryption at rest



Closing comments

- The S3 Connector encryption modifications have been contributed back to Alfresco
- Any questions? Come find me afterwards…

- **References**
  - https://www.owasp.org/index.php/Cryptographic_Storage_Cheat_Sheet
  - http://www.ixxus.com/case-study/cengage-learning/
  - http://www.ixxus.com/content-encryption-alfresco/

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