AWS

SUMMIT

Building Your First Data Lake

Modern Data Architectures on AWS

Dickson Yue
Solution Architect

21 June 2017

amazon web services

Today's conversation

Business drivers for a Data Lake

Designing and building

Production use cases

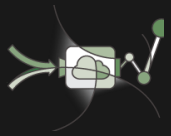
Business Outcomes on a Modern Data Architecture

Outcome 1 : Modernize and consolidate

- Insights to enhance business applications and create new digital services

Outcome 2 : Innovate for new revenues

- Personalization, demand forecasting, risk analysis



Outcome 3 : Real-time engagement

- Interactive customer experience, event-driven automation, fraud detection

Outcome 4 : Automate for expansive reach

- Automation of business processes and physical infrastructure

Expanding access requirements

Data scientists

Data analysts

Business users

Engagement platforms

Automation / events

1. More personas need access to data, through appropriate tools

2. More systems need to link to data for decision and process automation

3. Users need to be able to find information, and access it securely

Exponential growth of business data

Transactions

ERP

Web logs / cookies

Connected devices

Social media

1. Data must be captured from diverse sources at speed and scale

2. Data needs to be pulled together, breaking down traditional silos

3. Benefits need to far outweigh the costs of collection and analysis

Modern data architecture

Insights to enhance business applications, new digital services

Data sources

Ingest

Scale (Batch)

Speed (Real-time)

Serving

Data scientists

Data analysts

Business users

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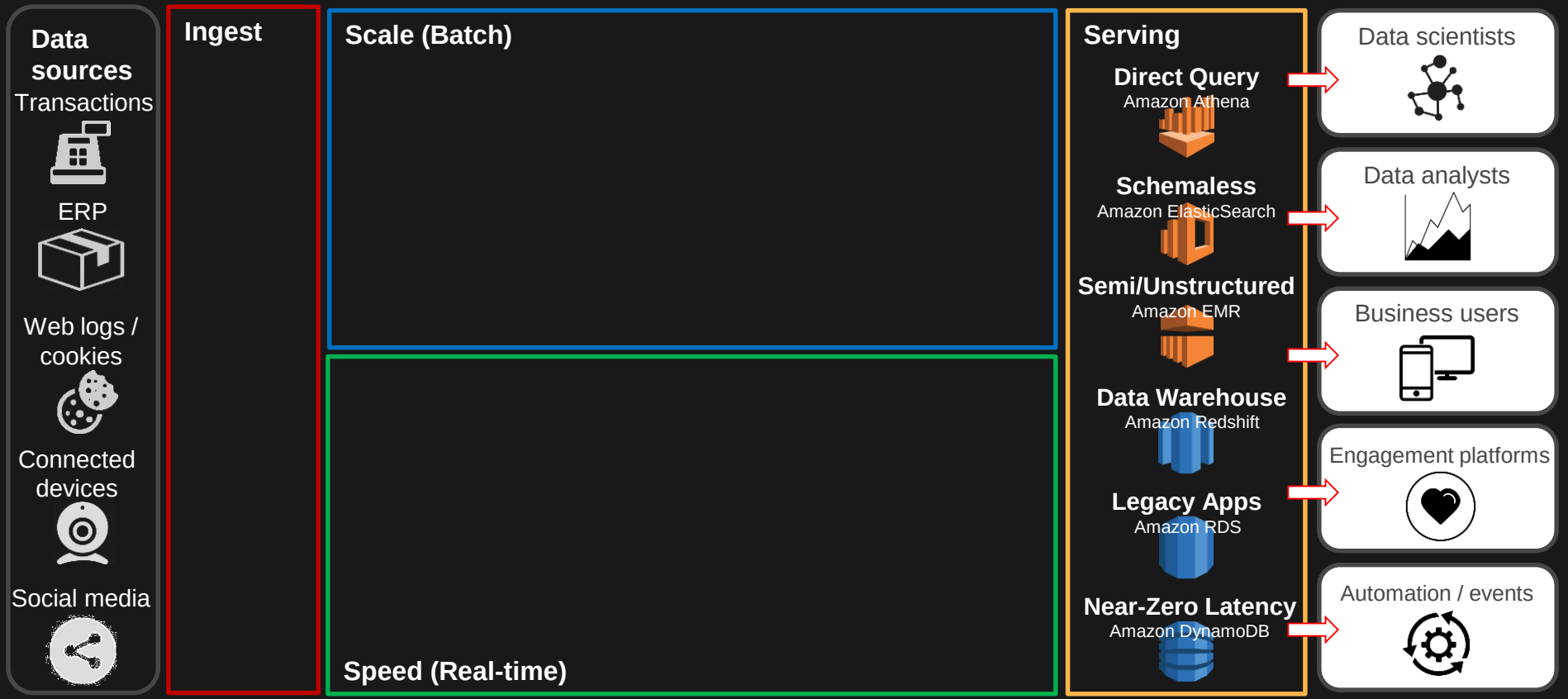
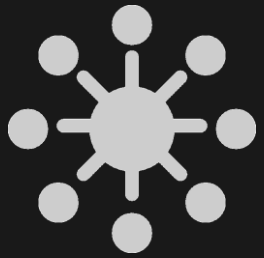


Characteristics of a Data Lake

Collect Anything

Dive in Anywhere



Flexible Access

Future Proof

Modern data architecture

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Ingest

Scale (Batch)

Durable Designed for 11 9s of durability

Available Designed for **99.99**% availability

Scalable Store as much as you need

Scale storage and compute independently

Amazon S3

Integrated

Amazon Redshift / Spectrum

Amazon EMR

Amazon Athena

Amazon DynamoDB

Speed (Real-time)

Serving

Direct Query
Amazon Athena

Schemaless
Amazon ElasticSearch

Semi/Unstructured
Amazon EMR

Data Warehouse
Amazon Redshift

Legacy Apps
Amazon RDS

Near-Zero Latency
Amazon DynamoDB

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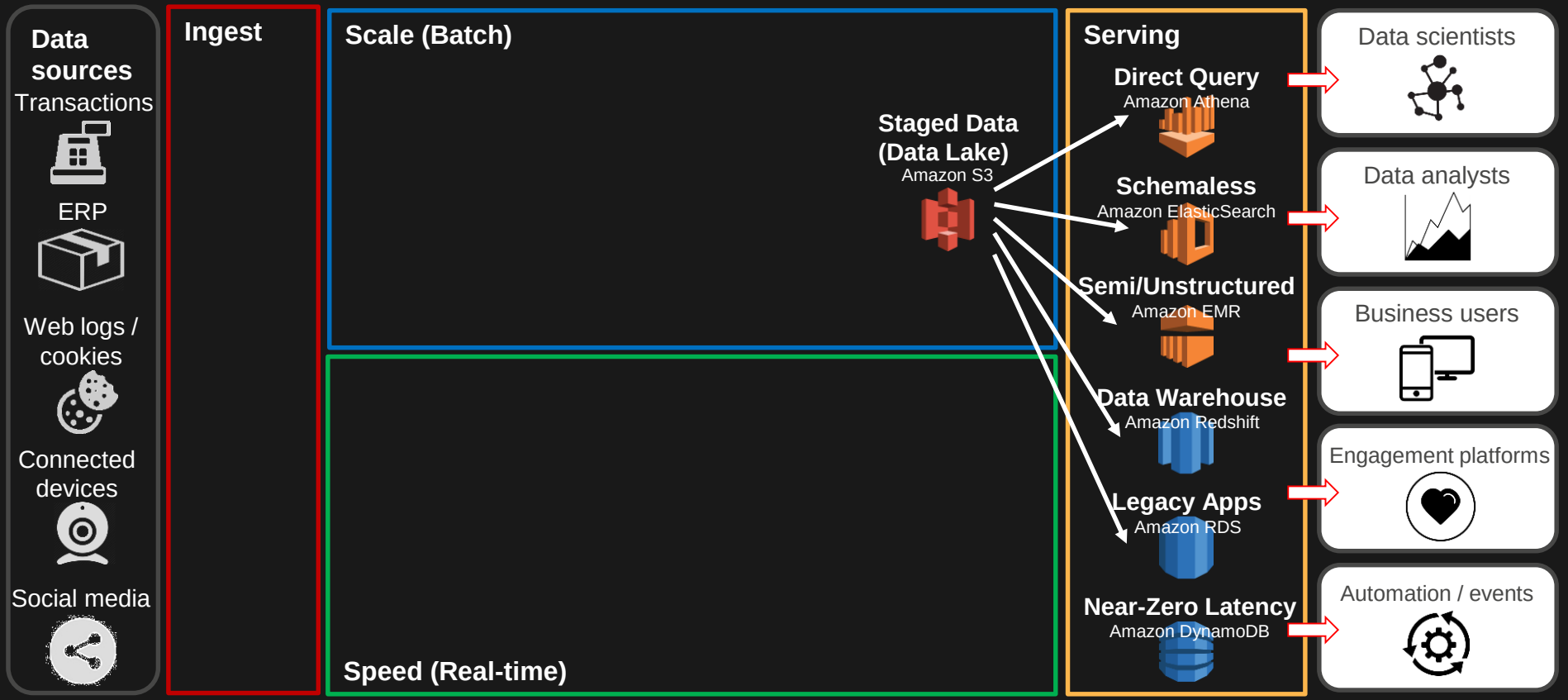

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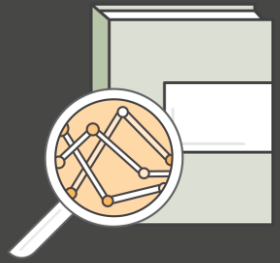
Important Components of a Data Lake

Access &
User Interface

Ingest & Store

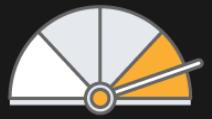


Catalogue
& Search

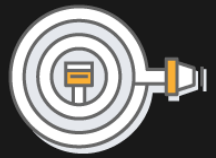
Protect
& Secure

Data Ingestion into S3

AWS Direct Connect



S3 Transfer Acceleration



Amazon Kinesis Firehose

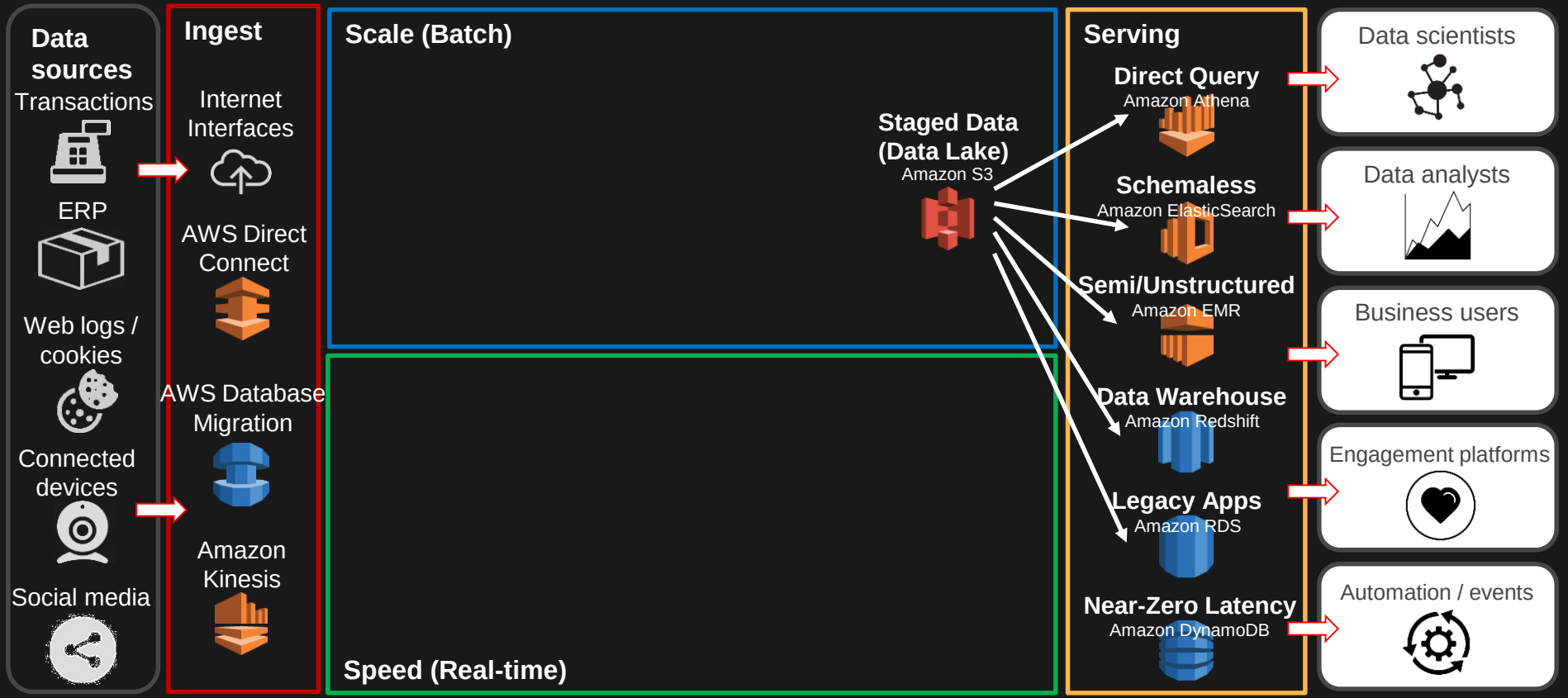
AWS Storage Gateway

ISV Connectors

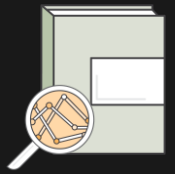
AWS Snowball

Modern data architecture

Insights to enhance business applications, new digital services

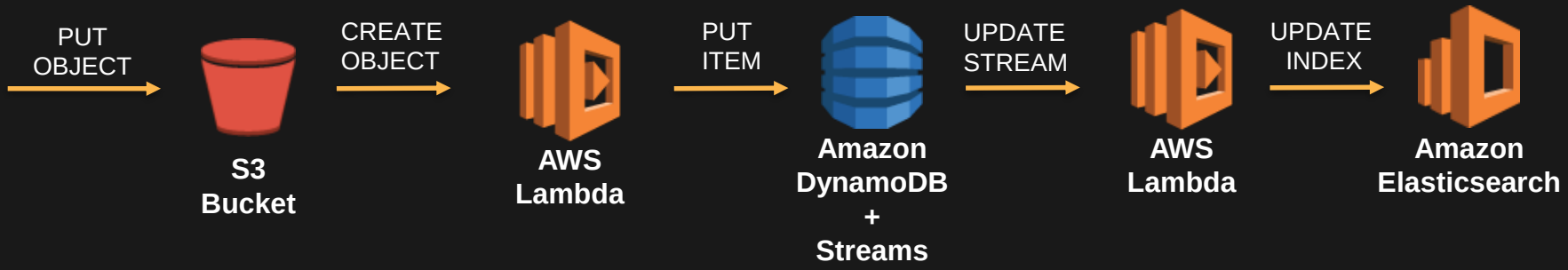


Building a Data Catalogue



- Aggregated information about your storage & streaming layer
- Storage service for metadata
  - Ownership, data lineage
- Data abstraction layer
  - Customer data = collection of prefixes
- Enabling data discovery
- API for use by entitlements service

Populating Metadata and Search



Available 2H 2017

AWS Glue

Managed Transform Engine

Job Scheduler

Data Catalog

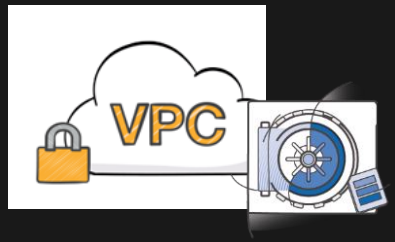
Built on Apache Spark

Integrated with S3, RDS, Redshift & any JDBC-compliant data store

Implement the right cloud security controls

Encryption

- SSL endpoints
- Server Side Encryption (SSE-S3)
- S3 Server Side Encryption with provided keys (SSE-C, SSE-KMS)
- Client-side Encryption



Security

- Identity and Access Management (IAM) policies
- Bucket policies
- Access Control Lists (ACLs)
- Private VPC endpoints to Amazon S3
- Pre-signed S3 URLs

Audit & Compliance

- Buckets access logs
- Lifecycle Management Policies
- Versioning & MFA deletes
- Certifications – HIPAA, PCI, SOC 1/2/3 etc.

Modern data architecture

Insights to enhance business applications, new digital services

AWS IAM
AWS KMS
AWS Cloud Trail
Amazon CloudWatch

Data sources
Transactions
ERP
Web logs / cookies
Connected devices
Social media

Ingest
Internet Interfaces
AWS Direct Connect
AWS Database Migration
Amazon Kinesis

Scale (Batch)

Staged Data (Data Lake)
Amazon S3

Speed (Real-time)

Serving
Direct Query
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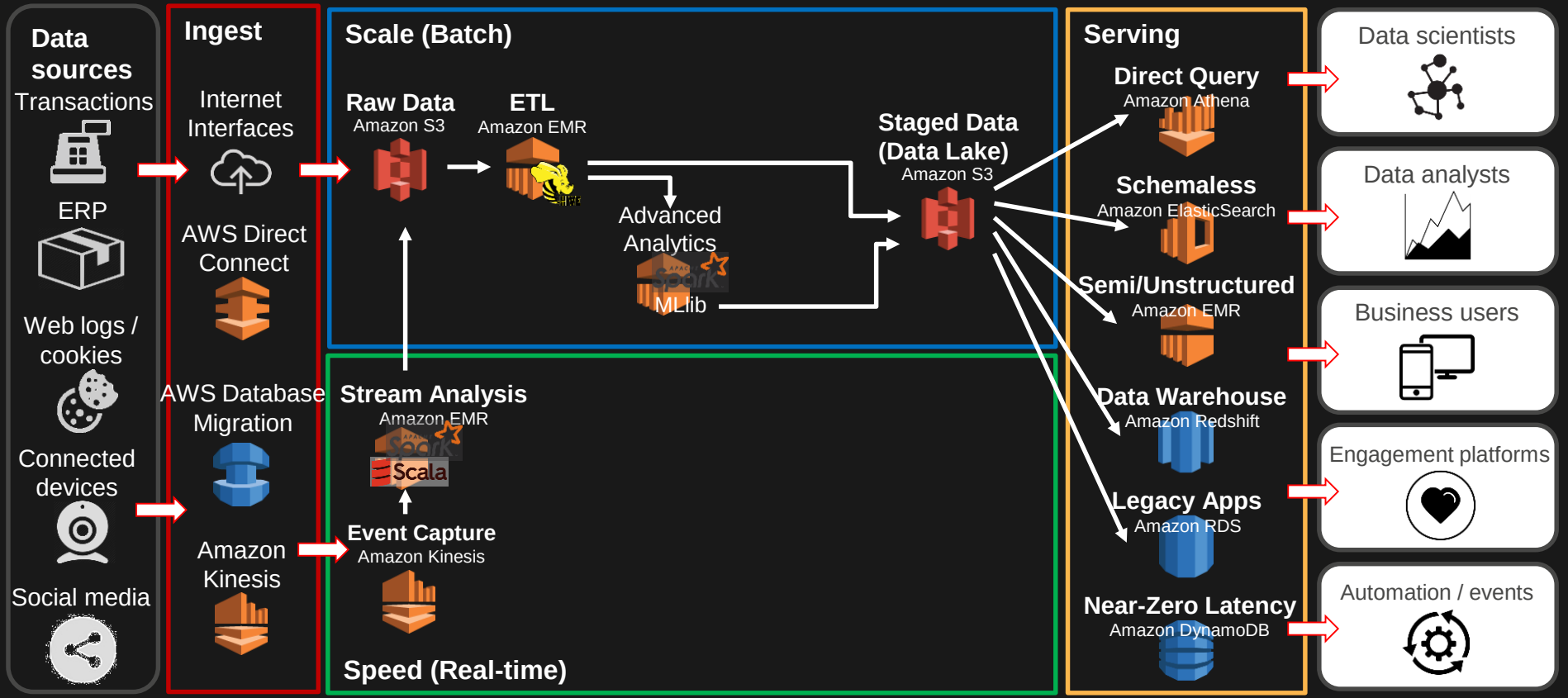

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Clickstream Analytics Pipeline

HK01

Angus Tse
Director of Engineer

21 June 2017

amazon web services

【圖輯】33度晴空下　汗水換來乾淨街道　清潔工玉姐的故事

她的汗水和努力，讓街坊可以享受清潔的街道。嚴夏之中，她辛勞的工作，你又知道嗎？

【圖輯】33度晴空下　汗水換來乾淨街道　清潔工玉姐的故事

【英國大選．圖輯】雙城記：兩個肯辛頓　看大選前夕分裂的⋯

【攝影集】攝影師游走各國遊樂場　拼出相似卻不同的童年時光

【紐約影像】紐約街頭紀實　公共空間光與影的偶遇

【社區影像】香港最後的人力車伕　時代轉變客人難求（有片）

娛樂 ›

熱門文章

1 【羅東邨倫常案】全天候照顧病妻　殺妻翁曾向胞弟透露「好辛苦」

2 新西蘭最南端擬

Growth

DATA BEATS EMOTIONS

Sean Rad

Founder & CEO Tinder

Clickstream Analytics

香港
01

Google Analytics (GA)

- Free and easy
- Excellent for initial
- Good learning materials

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- Free and easy
- Excellent for initial
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- free version latency & accuracy issue
- GA 360 (Premium) + BigQuery are expensive
- Not flexible enough

Our needs

- Large data volume
- Raw data for Machine Learning
- Flexible for further processing
- Low latency

Building a scalable pipeline on AWS

香港
01

Piwik

- Open-source analytics platform
- Realtime dashboard
- Web & mobile SDK
  - PageView
  - Content / Media
  - A/B Test

PIWIK

Finding the Piwik Tracking Code

To use all the features described in this page, you need to use the latest version of the tracking code. To find the tracking code for your website, follow the steps below:

- log in to Piwik with your admin or Super User account
- click on your username in the top right menu, and click *Settings* to access the administration area
- click on *Tracking Code* in the left menu
- copy and paste the JavaScript tracking code into your pages, just after the opening `<body>` tag (or within the `<head>` section)

The tracking code looks as follows:

```
<!-- Piwik -->
<script type="text/javascript">
  var _paq = _paq || [];
  _paq.push(['trackPageView']);
  _paq.push(['enableLinkTracking']);
  (function() {
    var u="//{$PIWIK_URL}/";
    _paq.push(['setTrackerUrl', u+'piwik.php']);
    _paq.push(['setSiteId', {$IDSITE}]);
    var d=document, g=d.createElement('script'), s=d.getElementsByTagName('script')[0];
    g.type='text/javascript'; g.async=true; g.defer=true; g.src=u+'piwik.js'; s.parentNode.insertBefore
(g,s);
  })();
</script>
<!-- End Piwik Code -->
```

香港 01

Piwik

- Open-source analytics platform
- ~~Realtime dashboard~~
- Web & mobile SDK
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    _paq.push(['setSiteId', {$IDSITE}]);
    var d=document, g=d.createElement('script'), s=d.getElementsByTagName('script')[0];
    g.type='text/javascript'; g.async=true; g.defer=true; g.src=u+'piwik.js'; s.parentNode.insertBefore
(g,s);
  })();
</script>
<!-- End Piwik Code -->
```

香港 01

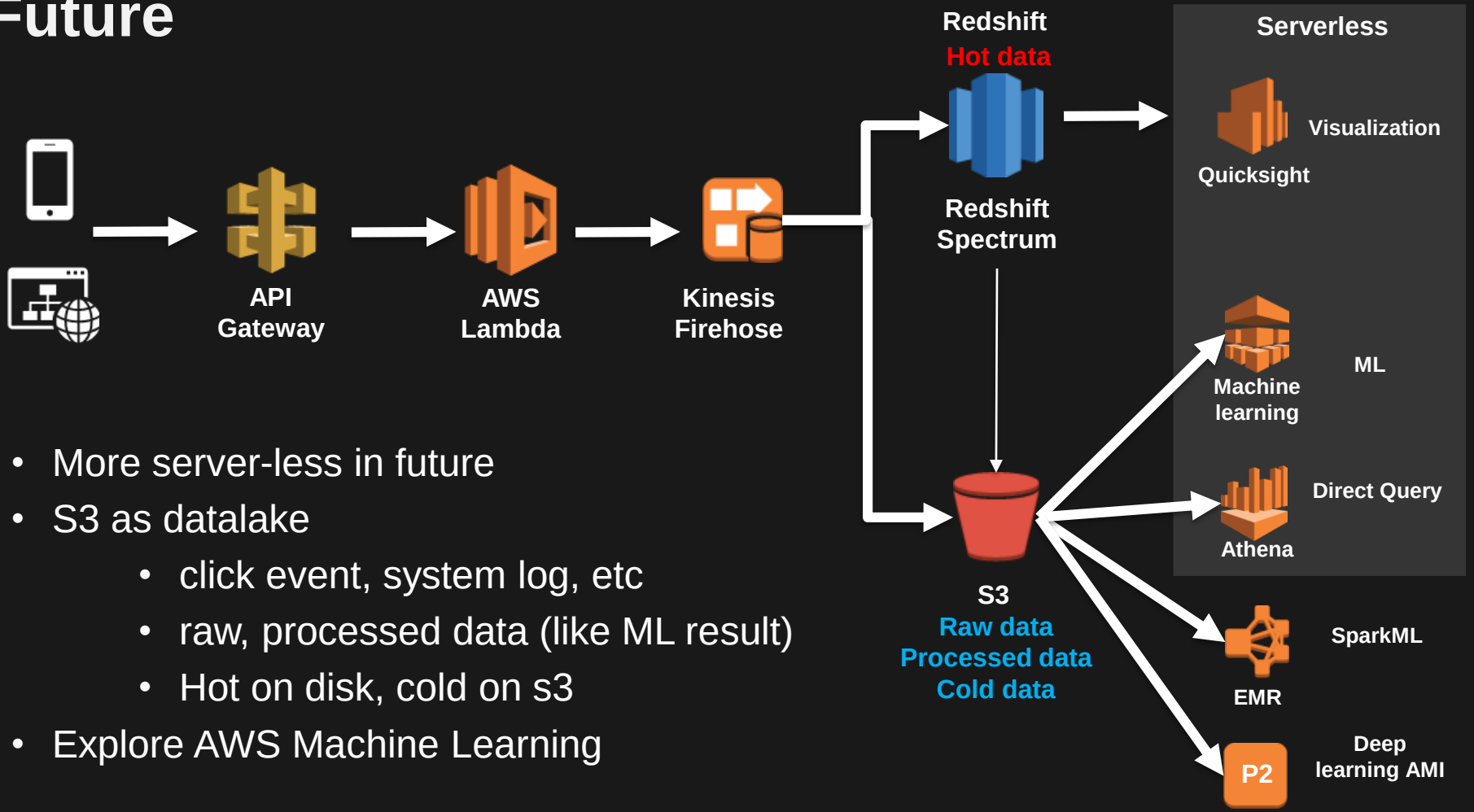
Phase 1


API
Gateway
AWS
Lambda
Kinesis
Firehose
Redshift
Quicksight

Experience on AWS

- **Complete** and Integrated
- **Quick**. 2 man weeks for first version
- **Easy** to scale
- **Minimal** maintenance cost

Future



- More server-less in future
- S3 as datalake
  - click event, system log, etc
  - raw, processed data (like ML result)
  - Hot on disk, cold on s3
- Explore AWS Machine Learning

Download HK01

We’re Hiring

香港01

AWS

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Thanks

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Summary

1. S3 as data lake
2. Pick the right tool to match the persona requirements
3. Go serverless