



Disclaimer

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Introduction

splunk®

Agenda

- Introducing Alcatel-Lucent and the Velocix CDN
- Splunk Professional Services
- The Big Data Problem
- The Big Data Solution
- Velocix Reporting API
- Velocix Reporting User Interface
- Splunk Powered Reporting Platform

Testimonial

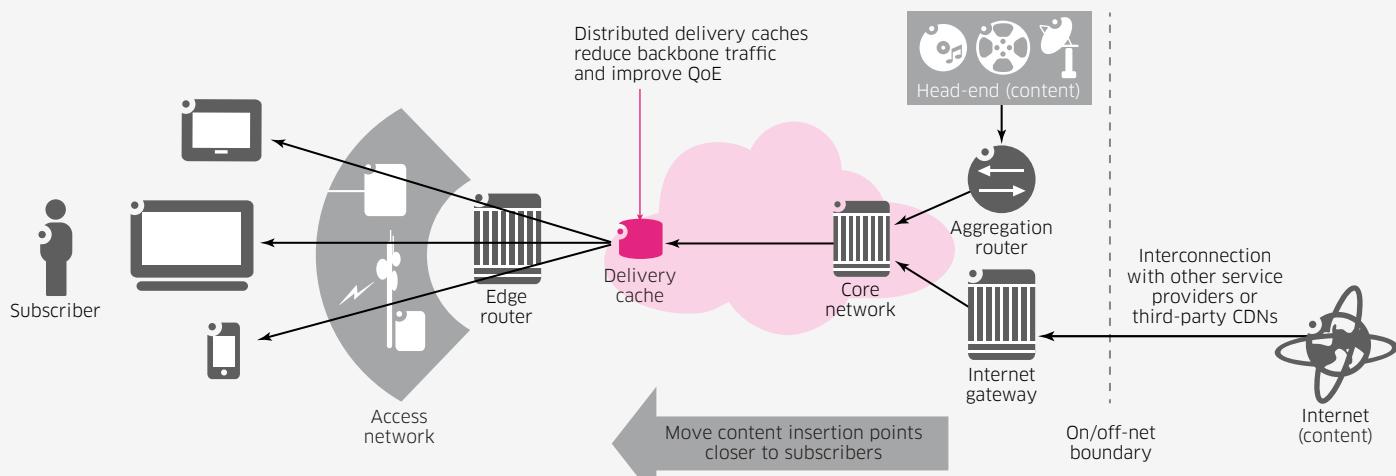
“Our customers are very positive about our Splunk Embedded analytics... Splunk Embedded enables us to deliver reporting that is richer and more versatile than anything a provider can achieve by bolting a third-party solution onto existing management tools. This value proposition gives Velocix CDN a powerful competitive advantage.”

Velocix CDN, Alcatel-Lucent

Customer Profile



What is a CDN?



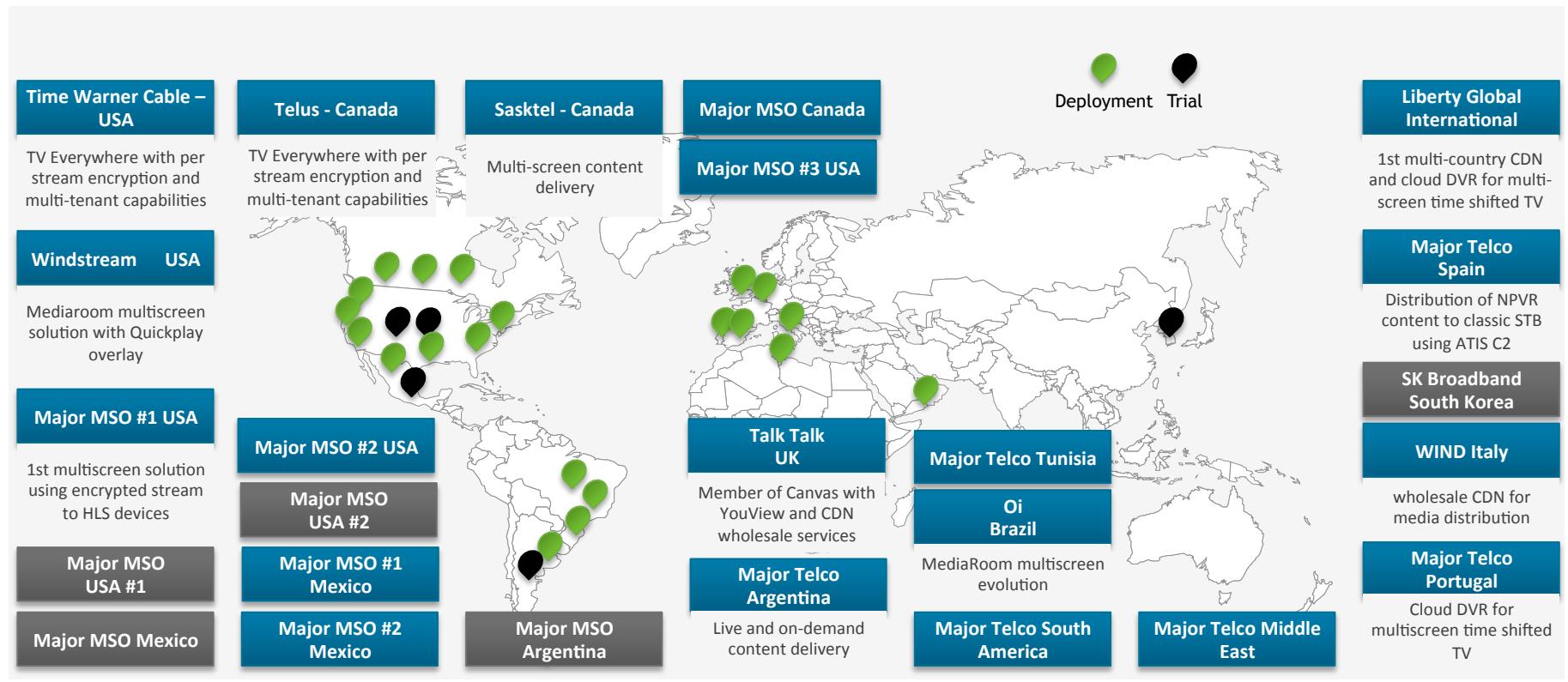
VELOCIX CONTENT DELIVERY NETWORK

Velocix CDN Market



- Strong momentum, driven by TV Everywhere rollouts in NA and UK
- Field-proven by leading telco and cable TV innovators
- Endorsed by major content providers (HBO, Starz, Epix, BBC, Sky, ...)
- Capable of supporting any network type: HFC, DSL/GPON and wireless
- Full ecosystem of strategic partners
- Global customer base, connecting over 30M subscribers to date

Velocix CDN Global References



Splunk Professional Services

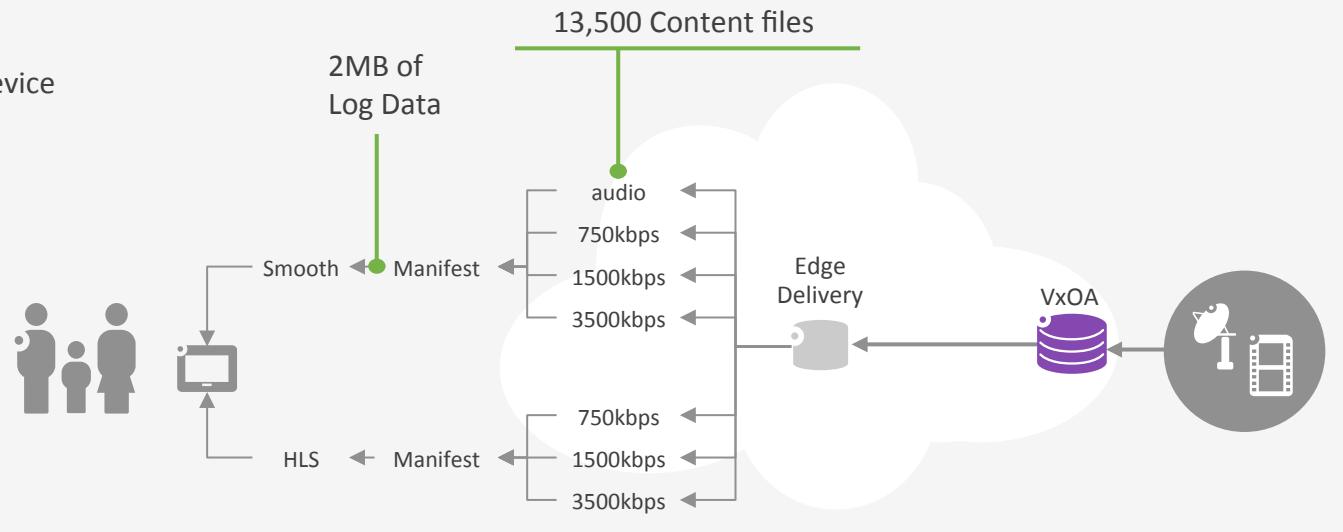
- Faster Time to Delivery
- Best Practice Guidance
- Use Case Development
- Architecture Guidance
- Advanced Customization
- Troubleshooting
- And more..



Adaptive Streaming

The Numbers

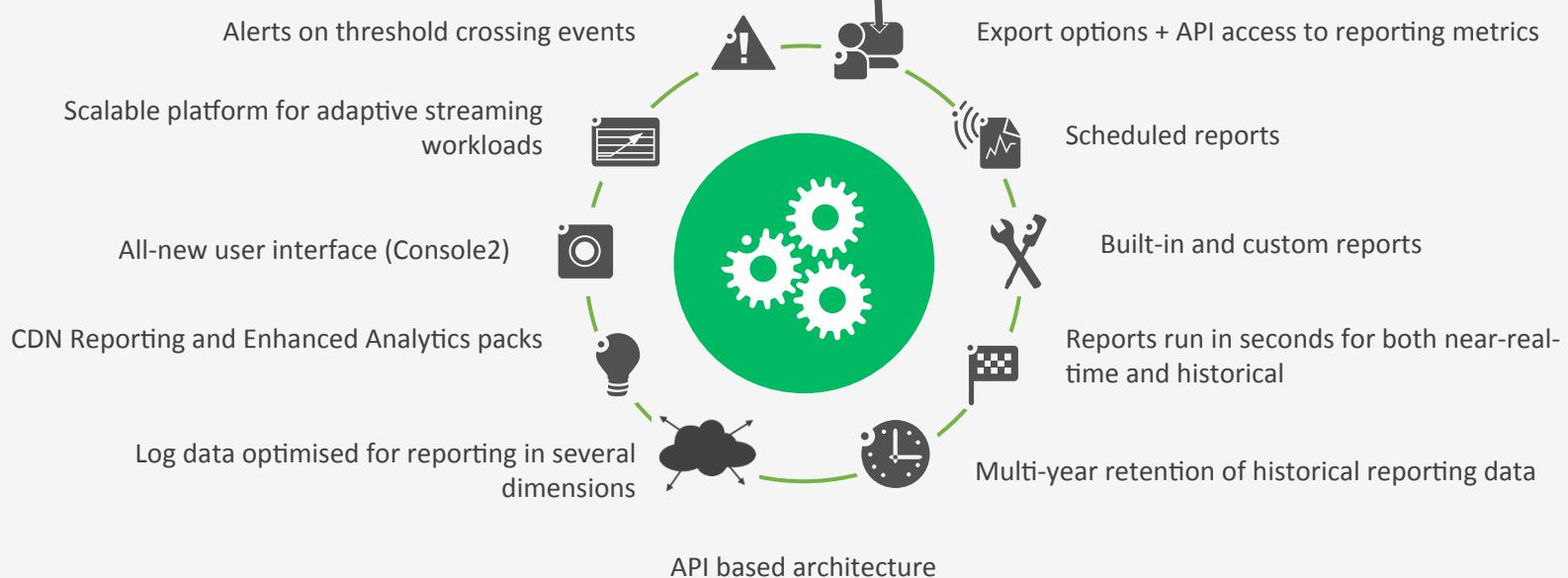
- 90 minute movie
- 2 different devices
- With just 3 bit rates for each device
- Small fragment sizes = massive amount of individual files - requiring careful management on the origin.
- In this example, we're generating two megabytes of log data for a single viewing of the movie.



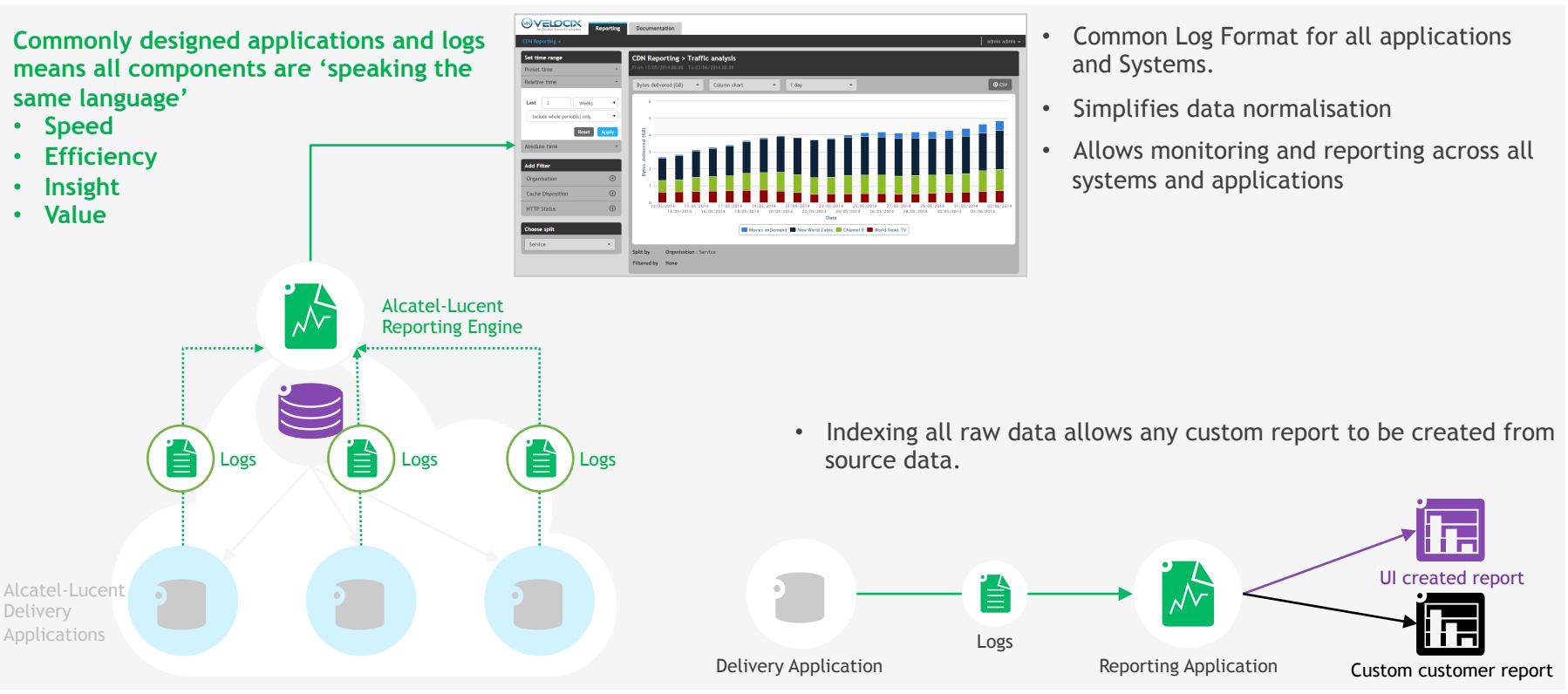


Advanced Reporting

Features



Optimising the end to end ALU solution



Seeing the wood from the trees

Extracting value from logs

Very High Volume Logs

Smooth Streaming = 30 logs per minute

Concurrent Streams

Multiple Servers



Data Repetition

Only one field change between log entries.



Near Real Time Reporting Gives Customers:

- Insight
- Network Monitoring



```
#Fields: s-dns date time x-duration c-ip c-port c-vx-zone c-vx-gloc cs-method cs-uri cs-
version cs(User-Agent) cs(Referer) cs(Cookie) cs(Range) sc-status s-cachestatus sc-bytes sc-
stream-bytes sc-dscp s-ip s-vx-rate s-vx-rate-status x-vx-serial rs-stream-bytes rs-bytes cs-
vx-token sc-vx-download-rate x-protohash
#Software: Velocix PCD 42.0.163766.163766
#Start-Date: 2015-08-17 14:30:00
cp1.zzz49d1.cdn 2015-08-17 14:30:36 0.110 172.31.176.4 42920 external g GET http://
testsite.zzz49s1.pub/static_file.txt 1.1 "NagiosChecker" - - 200 CACHE_MEMORY_HIT 929962
929603 0 192.168.176.131 0 - 3 0 0 - - WP:0300000000000000
cp1.zzz49d1.cdn 2015-08-17 14:30:38 0.090 172.31.176.4 42923 external g GET http://
testsite.zzz49s1.pub/static_file.txt 1.1 "NagiosChecker" - - 200 CACHE_MEMORY_HIT 929962
929603 0 192.168.176.131 0 - 3 0 0 - - WP:0300000000000000
cp1.zzz49d1.cdn 2015-08-17 14:30:40 0.070 172.31.176.4 42924 external g GET http://
testsite.zzz49s1.pub/static_file.txt 1.1 "NagiosChecker" - - 200 CACHE_MEMORY_HIT 929962
929603 0 192.168.176.131 0 - 3 0 0 - - WP:0300000000000000
cp1.zzz49d1.cdn 2015-08-17 14:30:40 0.090 200:81c0:4000:3141::320:100 42954 external g.gb
GET http://testsite6.zzz49s1.pub/static_file.txt 1.1 "NagiosChecker" - - 200 CACHE_MEMORY_HIT
929962 929603 0 2a00:81c0:4000:3151::500:100 0 - 11 0 0 - - WP:0b00000000000000
cp1.zzz49d1.cdn 2015-08-17 14:30:42 0.070 200:81c0:4000:3141::320:100 42955 external g.gb
GET http://testsite6.zzz49s1.pub/static_file.txt 1.1 "NagiosChecker" - - 200 CACHE_MEMORY_HIT
929962 929603 0 2a00:81c0:4000:3151::500:100 0 - 11 0 0 - - WP:0b00000000000000
cp1.zzz49d1.cdn 2015-08-17 14:30:45 0.110 2a00:81c0:4000:3141::320:100 42956 external g.gb
GET http://testsite6.zzz49s1.pub/static_file.txt 1.1 "NagiosChecker" - - 200 CACHE_MEMORY_HIT
929962 929603 0 2a00:81c0:4000:3151::500:100 0 - 11 0 0 - - WP:0b00000000000000
cp1.zzz49d1.cdn 2015-08-17 14:31:50 0.950 172.31.176.4 43018 external g GET http://
download.zzz49.pub/bt/f5eca038739d55e031c2a4ebdd934a3494b6219c/data 1.0 "Wget/1.11.4 Red Hat
modified" - - 200 - 12918896 12918482 0 192.168.176.131 0 - 2 0 0 - -
BT:f5eca038739d55e031c2a4ebdd934a3494b6219c
cp1.zzz49d1.cdn 2015-08-17 14:31:52 1.430 2a00:81c0:4000:3141::320:100 43050 external g.gb
GET http://download.zzz49.pub/bt/f5eca038739d55e031c2a4ebdd934a3494b6219c/data 1.0 "Wget/
1.11.4 Red Hat modified" - - 200 - 12918896 12918482 0 2a00:81c0:4000:3151::500:100 0 - 2 0
0 - - BT:f5eca038739d55e031c2a4ebdd934a3494b6219c
cp1.zzz49d1.cdn 2015-08-17 14:34:03 0.080 172.31.176.4 60900 external g GET https://
sslsite.zzz49s1.pub/static_file.txt 1.1 "NagiosChecker" - - 200 CACHE_MEMORY_HIT 929963 929603
0 192.168.176.131 0 - 8 0 0 - - WP:0800000000000000
cp1.zzz49d1.cdn 2015-08-17 14:34:05 0.070 172.31.176.4 60901 external g GET
```

Advanced Reporting

Principles

HTTP adaptive streaming leads to a **big data problem** dealt with by using a **big data approach powered by Splunk**.

Efficient Log Data Storage

- Nothing stripped from incoming log data
- Distributed across a horizontally scalable platform
- Replicated across sites for high availability

Optimised For Reporting

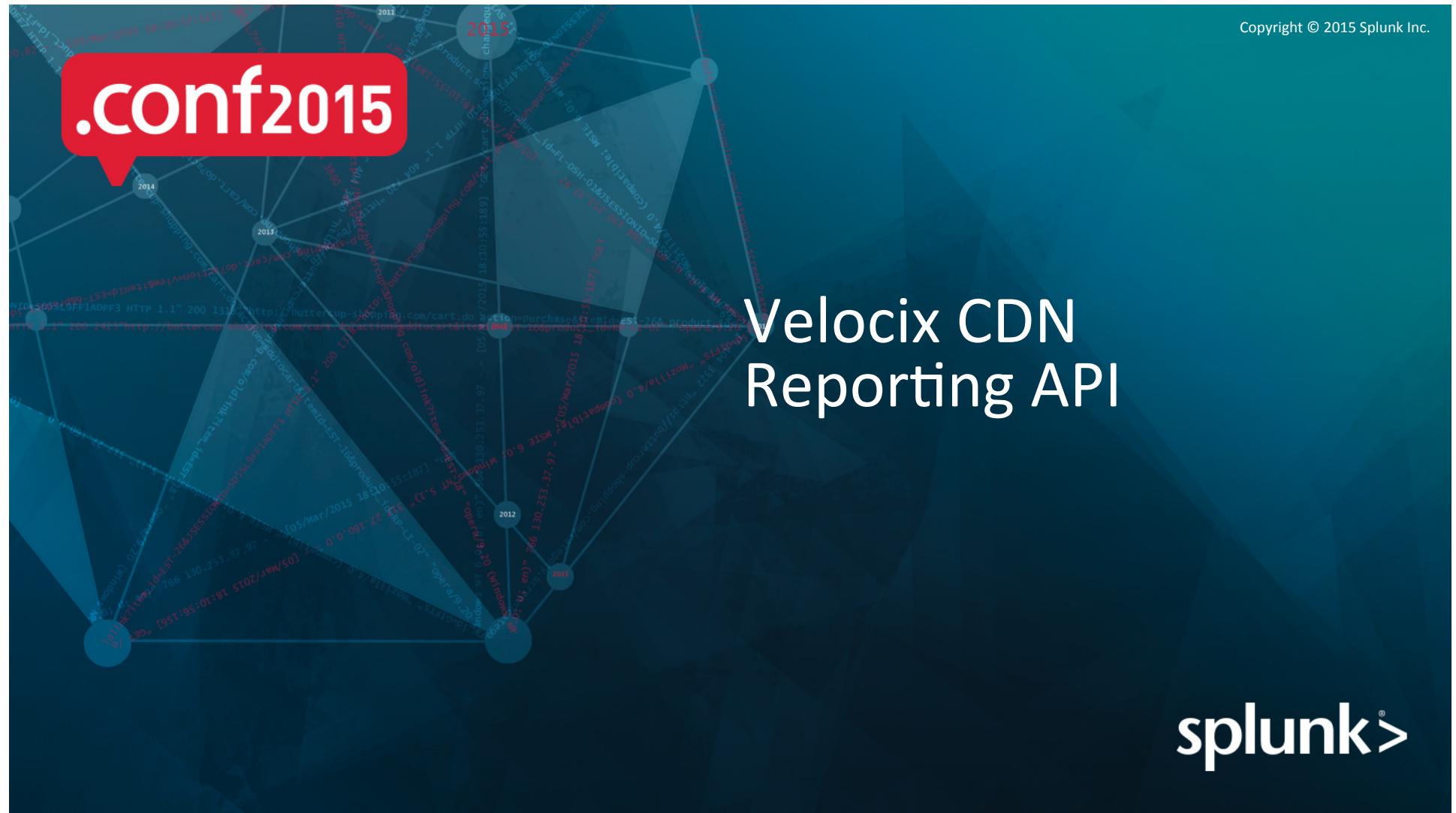
- Key metrics about network traffic, errors, caching efficiency and content popularity are extracted and calculated as logs arrive
- Daily summaries generated for long term trend analysis

Custom Reporting

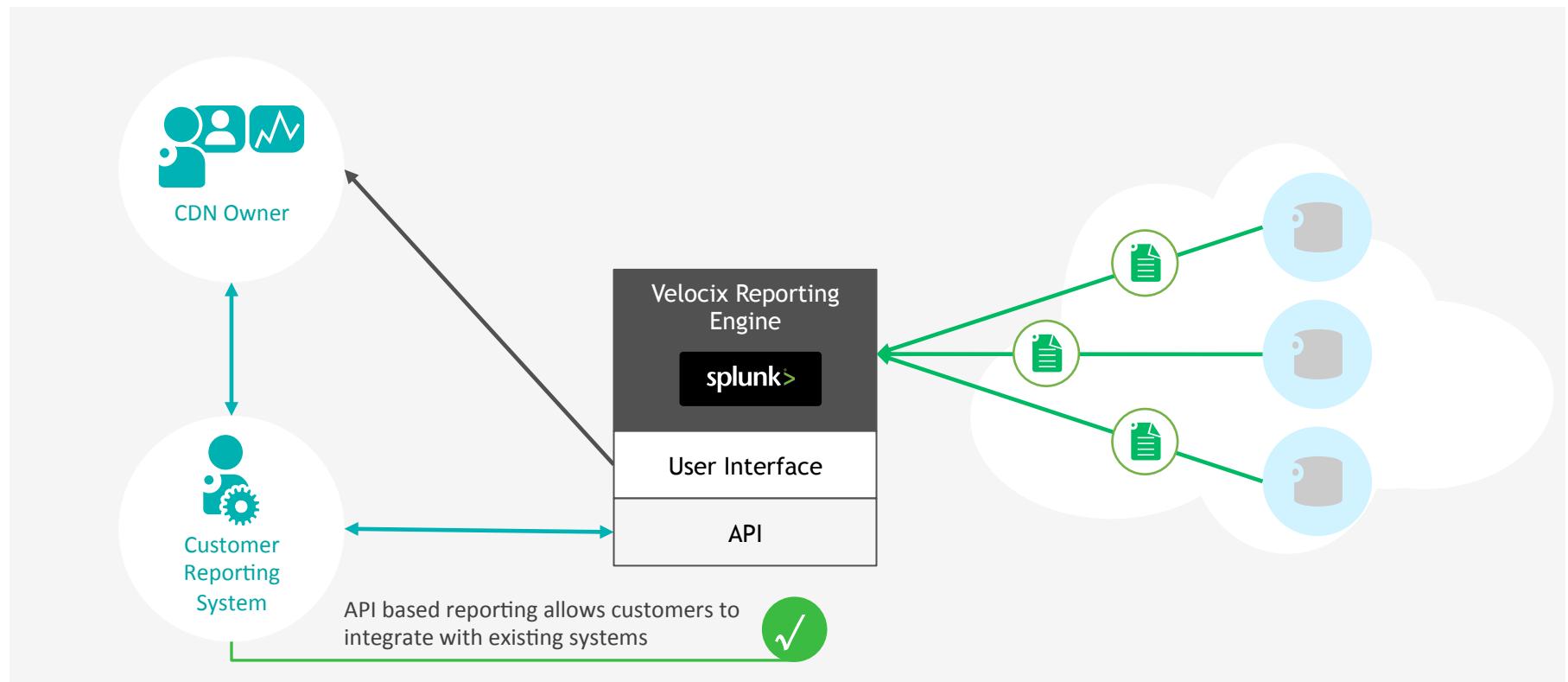
Just because log data might not be optimised in a certain way shouldn't mean that you can't report on it.

Bespoke reporting allows jobs to be scheduled, run in the background and send a notification when they are done.

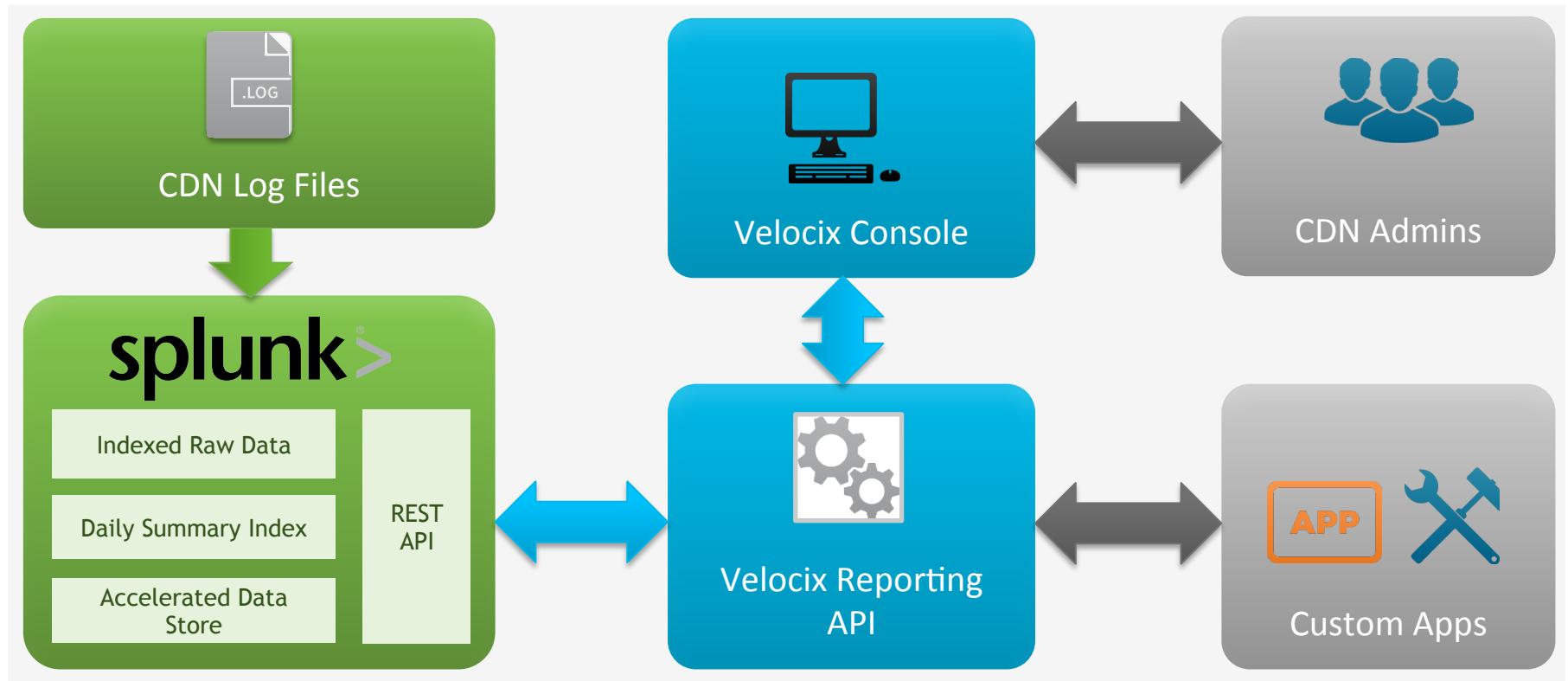




Ready Made & Custom Reporting Solution

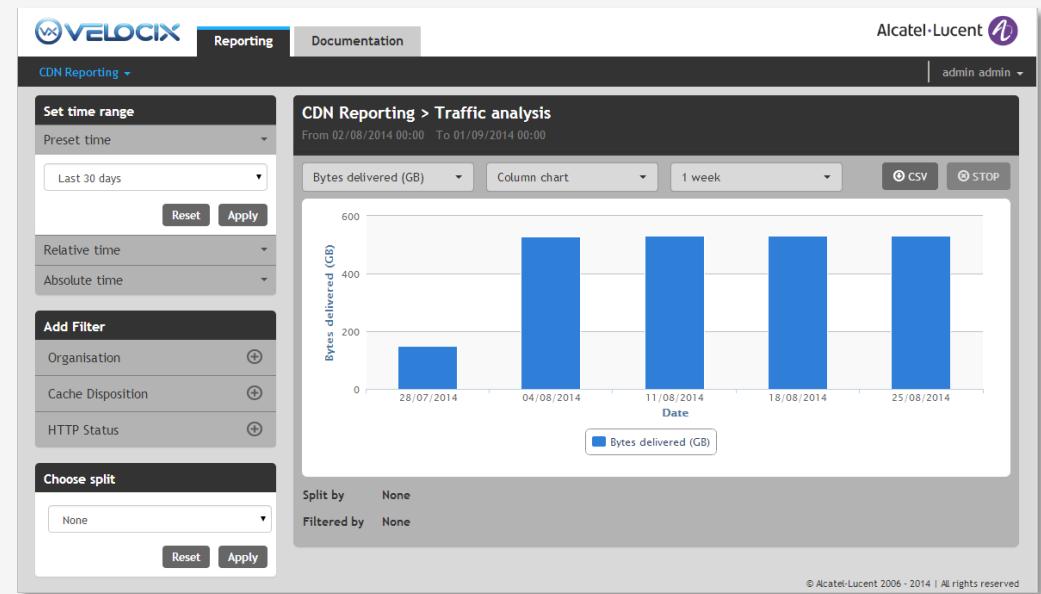


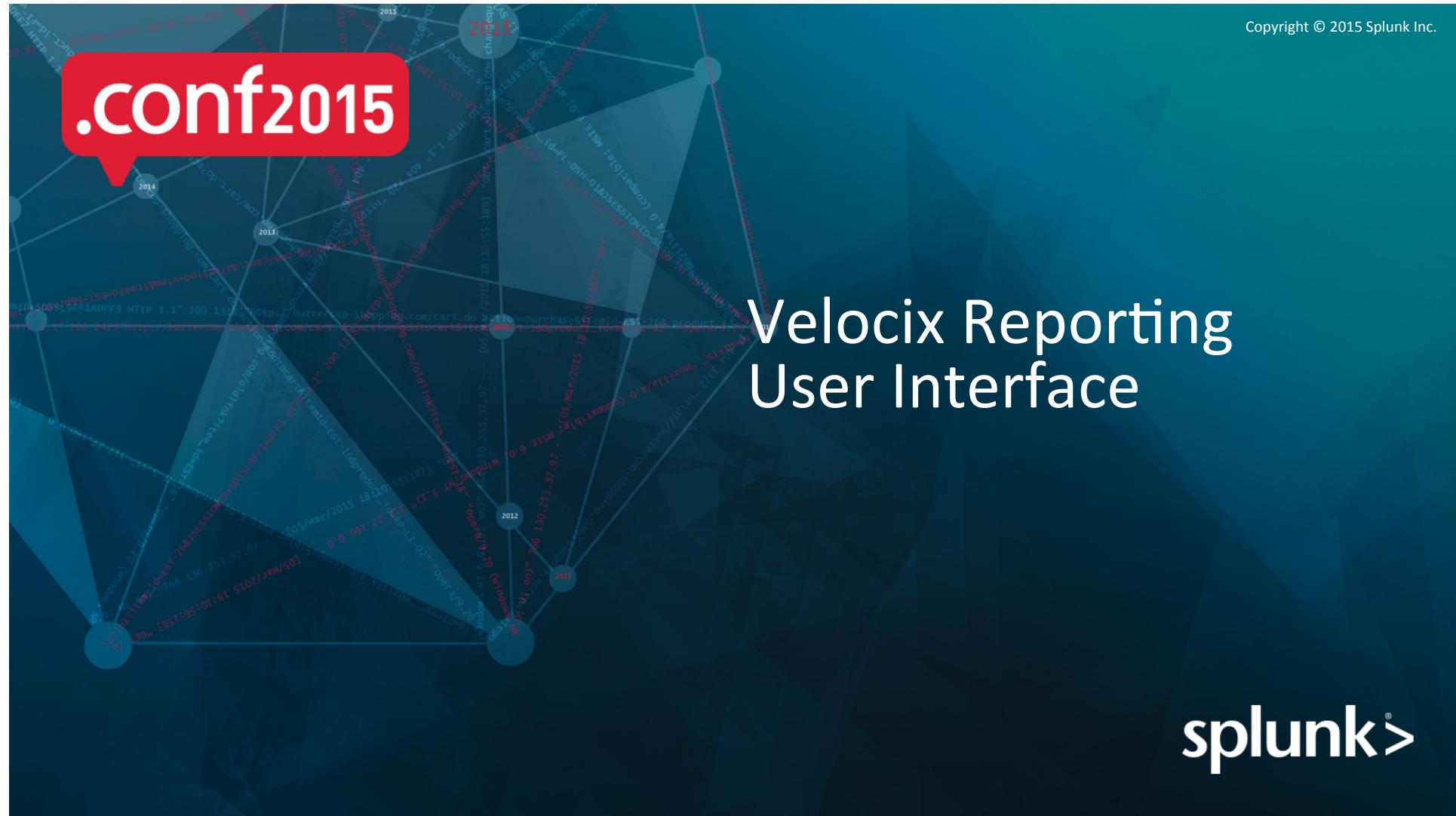
Reporting Architecture



Reporting is API Driven

```
{ "_links": {  
    "http://uri.velocix.com/relation/owner": {  
      "name": "jobs",  
      "profile": "http://uri.velocix.com/profile/unapi/  
      \"title\": \"Report Job Collection\""  
    },  
    "self": {  
      "href": "https://us0.zzz44s1.cdn:449/jobs/admin  
      \"profile\": \"http://uri.velocix.com/profile/unapi/  
      \"title\": \"Results for the Traffic analysis report\""  
    }  
},  
"columns": [  
  [  
    "28/07/2014",  
    "04/08/2014",  
    "11/08/2014",  
    "18/08/2014",  
    "25/08/2014"  
  ],  
  [  
    "149.414762",  
    "528.568406",  
    "530.261831",  
    "531.420959",  
    "531.715453"  
  ]  
],  
"fields": [  
  "Date",  
  "Bytes delivered (GB)"  
] }
```





UI Technologies



GRUNT



UNDERSCORE.JS



jQuery
write less, do more.



HIGHCHARTS



jQuery
user interface

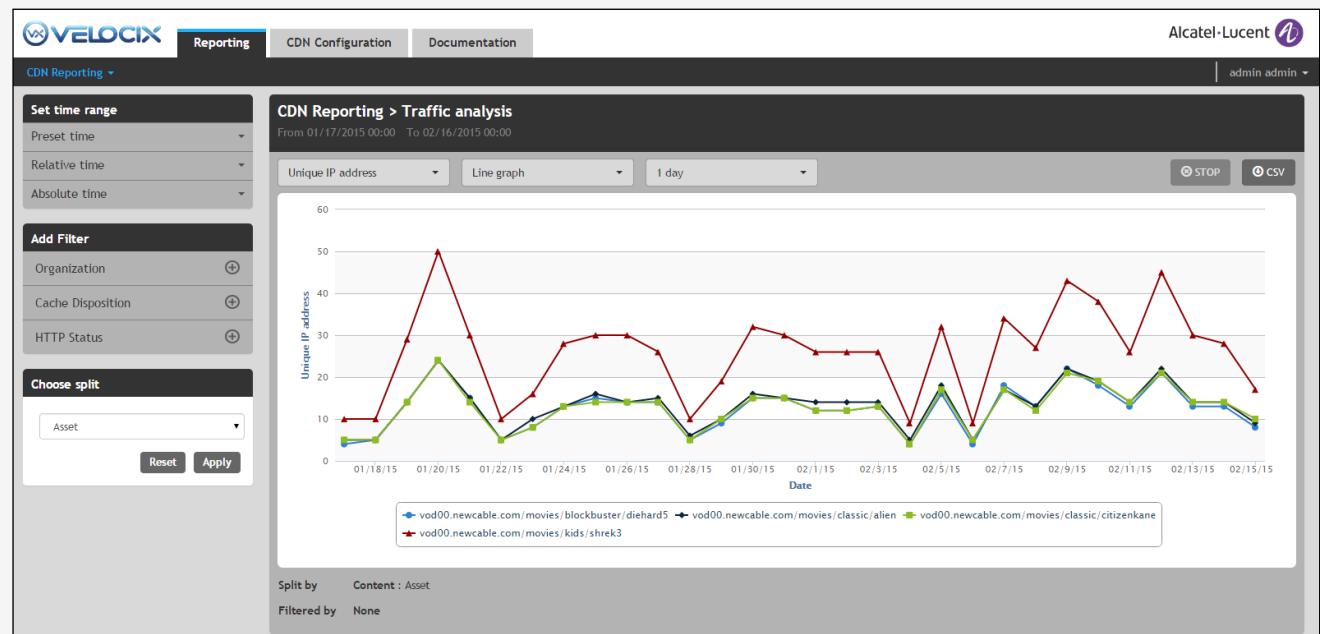
Sinon.js

pubsub
find the future

KARMA

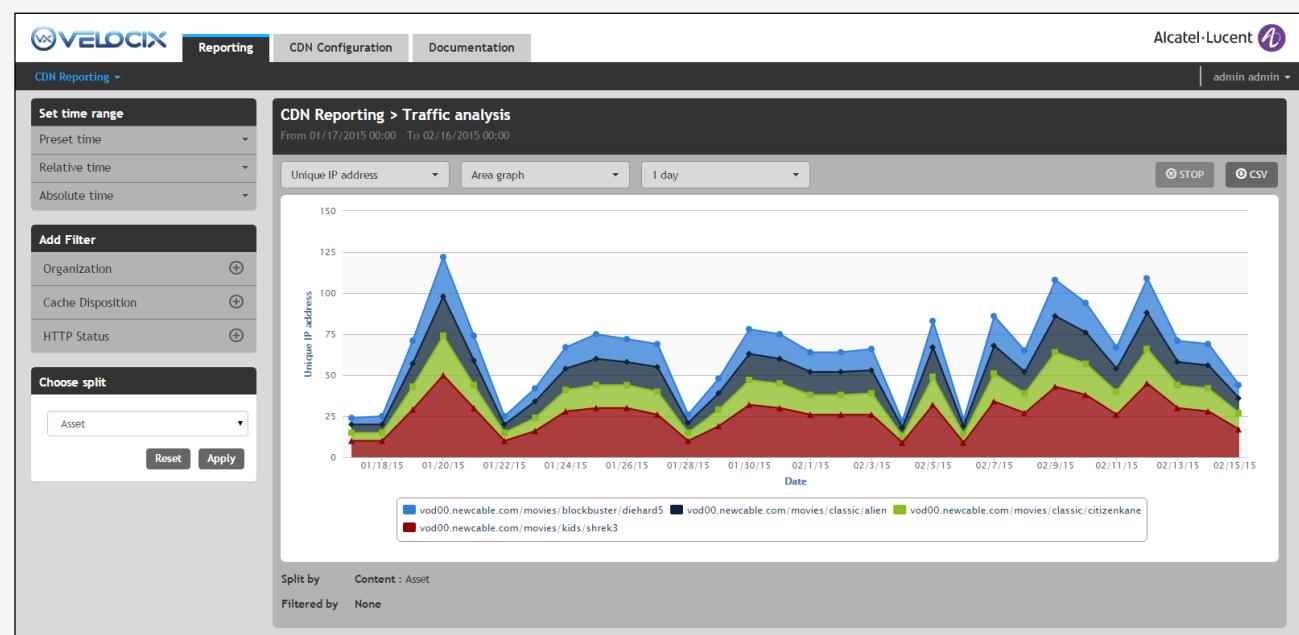
Visualisations

- Line graph
- Area graph
- Column chart
- Pie chart
- Bar chart
- Geo map
- CSV export



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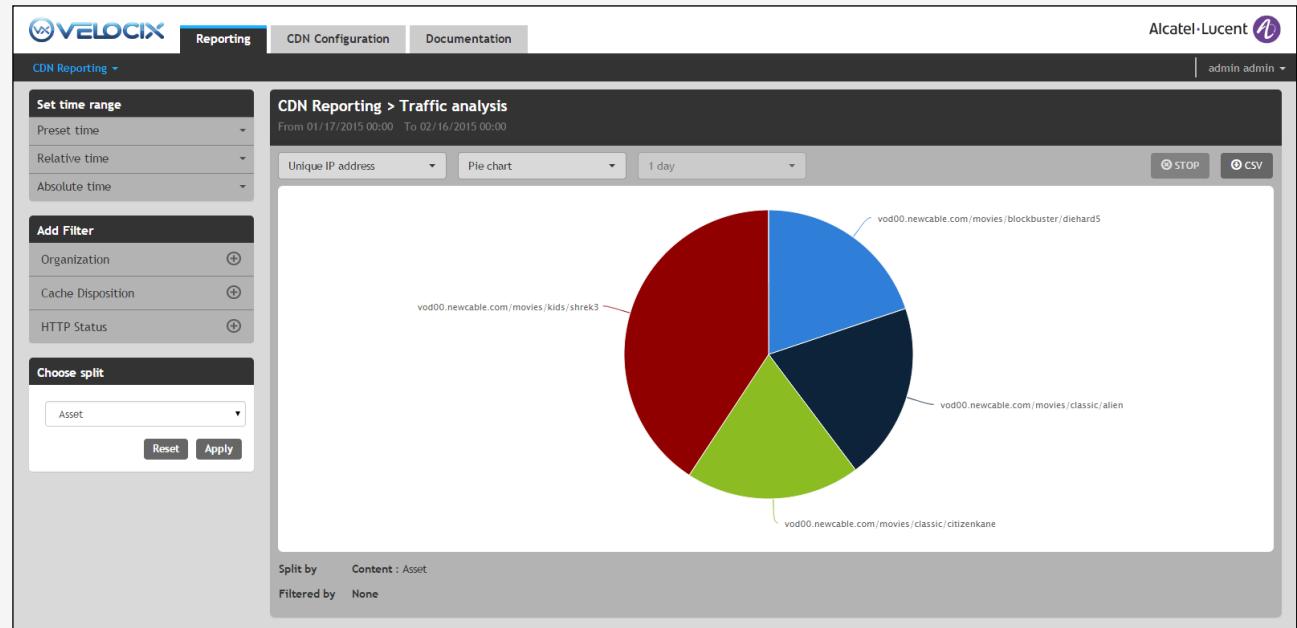
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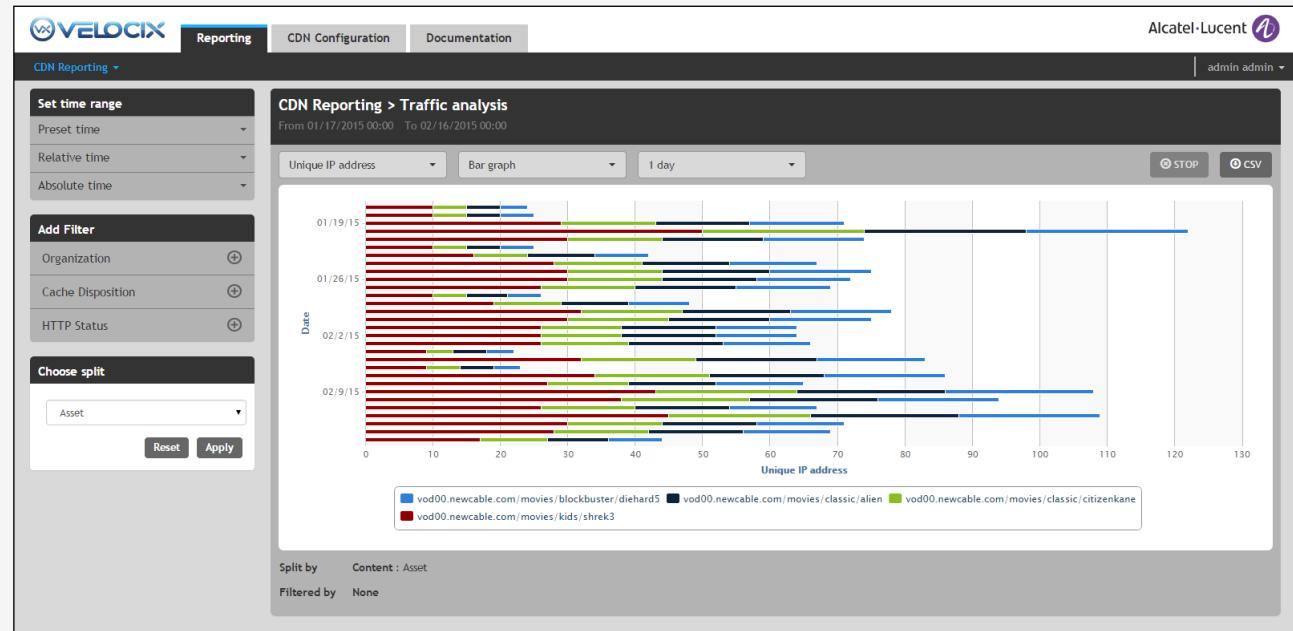
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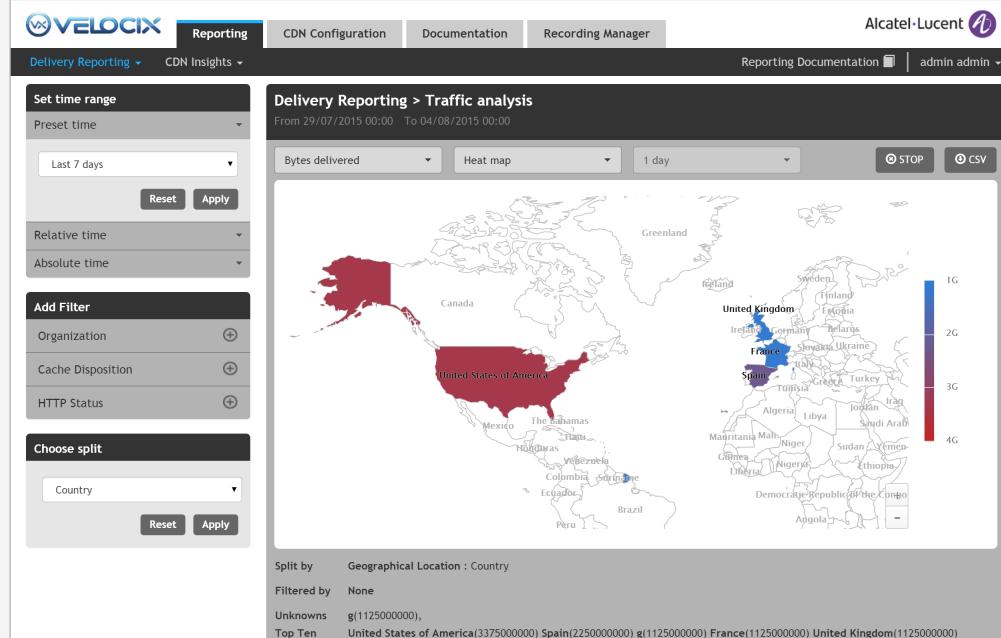
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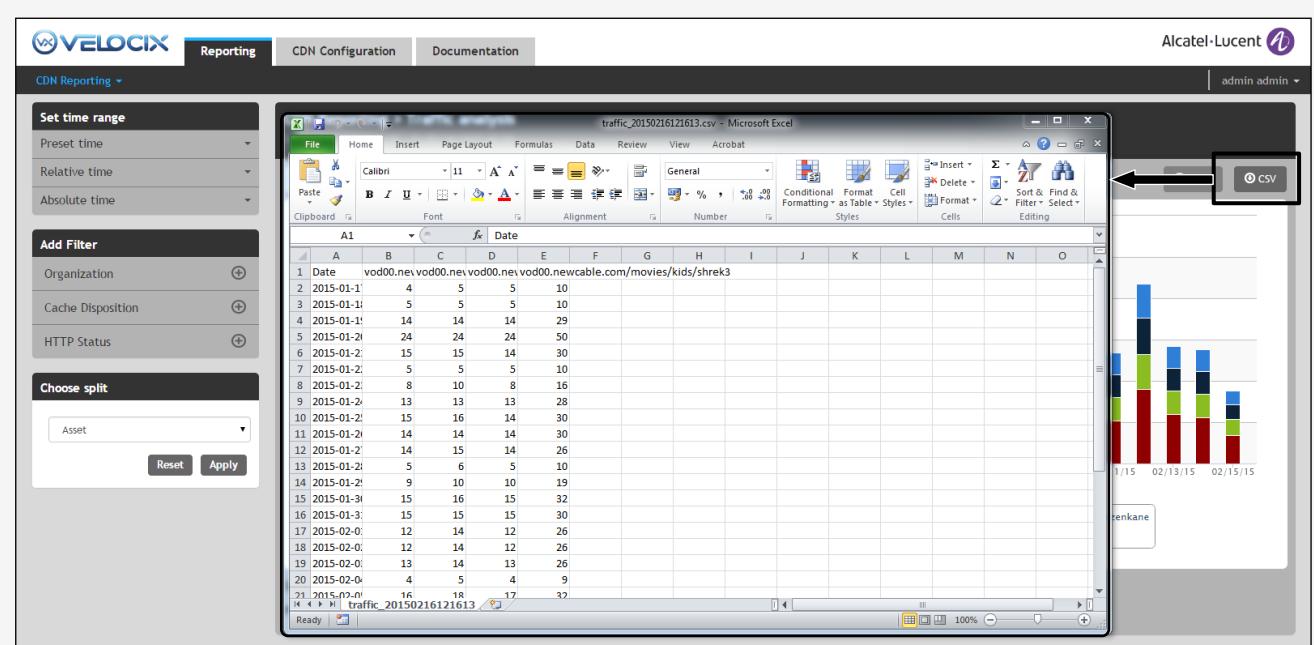
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Click To Zoom

Click to Zoom allows the ability for the customer to instantly examine a portion of the reporting data in more detail.

Simply click and drag over the range of data for which you require a more detailed view. The selected area will then expand to fill the visualisation area.

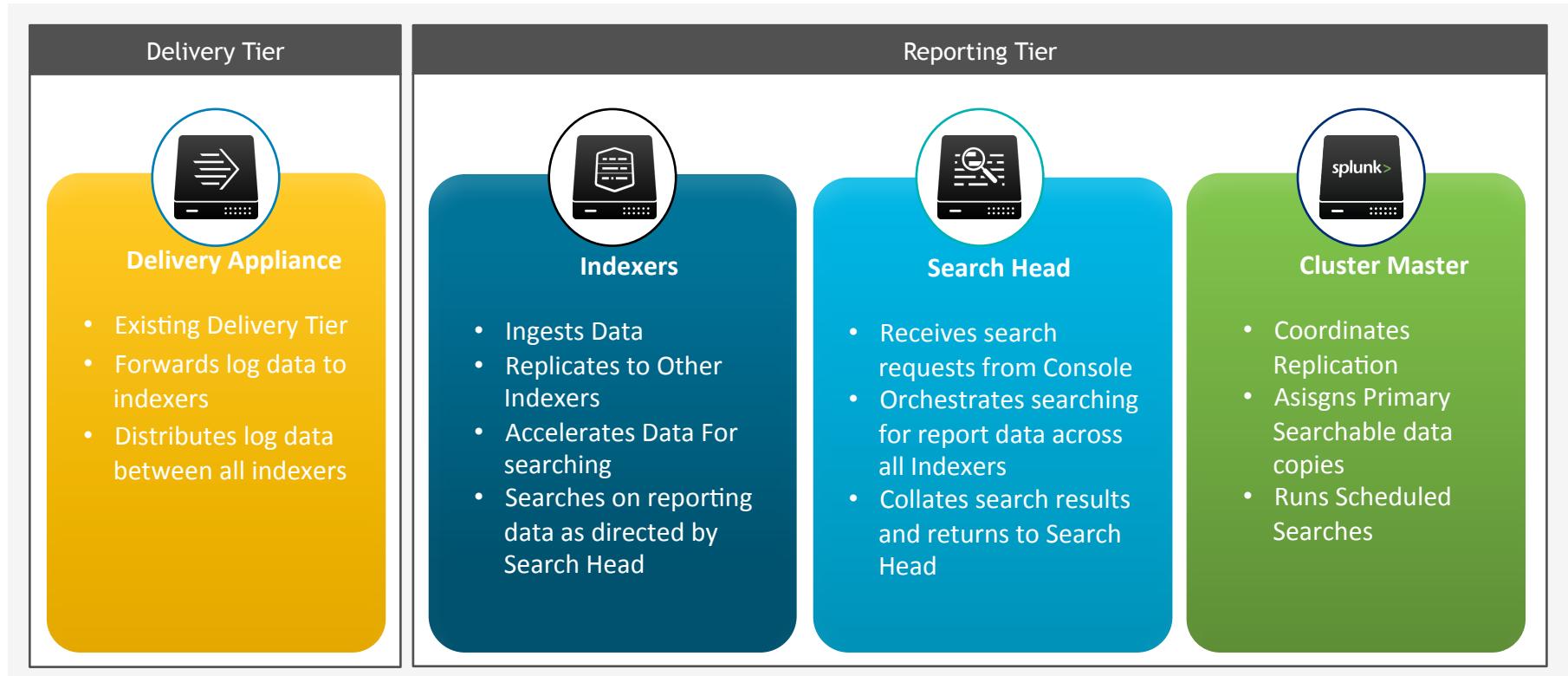
'Reset Zoom' at the top right of the graph will allow the zoom to be reverted to its original visualisation when clicked.

The diagram shows two screenshots of a 'CDN Reporting > Traffic analysis' interface. The top screenshot shows a full-day view from 01/04/15 to 01/30/15. The bottom screenshot shows a zoomed-in view from 01/13/15 to 01/18/15, with a 'Reset zoom' button highlighted in a red box.

| Date | Bytes delivered |
|----------|-----------------|
| 01/04/15 | ~10GB |
| 01/05/15 | ~10GB |
| 01/06/15 | ~10GB |
| 01/07/15 | ~10GB |
| 01/08/15 | ~10GB |
| 01/09/15 | ~10GB |
| 01/10/15 | ~10GB |
| 01/11/15 | ~10GB |
| 01/12/15 | ~10GB |
| 01/13/15 | ~10GB |
| 01/14/15 | ~10GB |
| 01/15/15 | ~10GB |
| 01/16/15 | ~10GB |
| 01/17/15 | ~10GB |
| 01/18/15 | ~10GB |
| 01/19/15 | ~10GB |
| 01/20/15 | ~10GB |
| 01/21/15 | ~10GB |
| 01/22/15 | ~10GB |
| 01/23/15 | ~10GB |
| 01/24/15 | ~10GB |
| 01/25/15 | ~10GB |
| 01/26/15 | ~10GB |
| 01/27/15 | ~10GB |
| 01/28/15 | ~10GB |
| 01/29/15 | ~10GB |
| 01/30/15 | ~10GB |



Reporting System Components

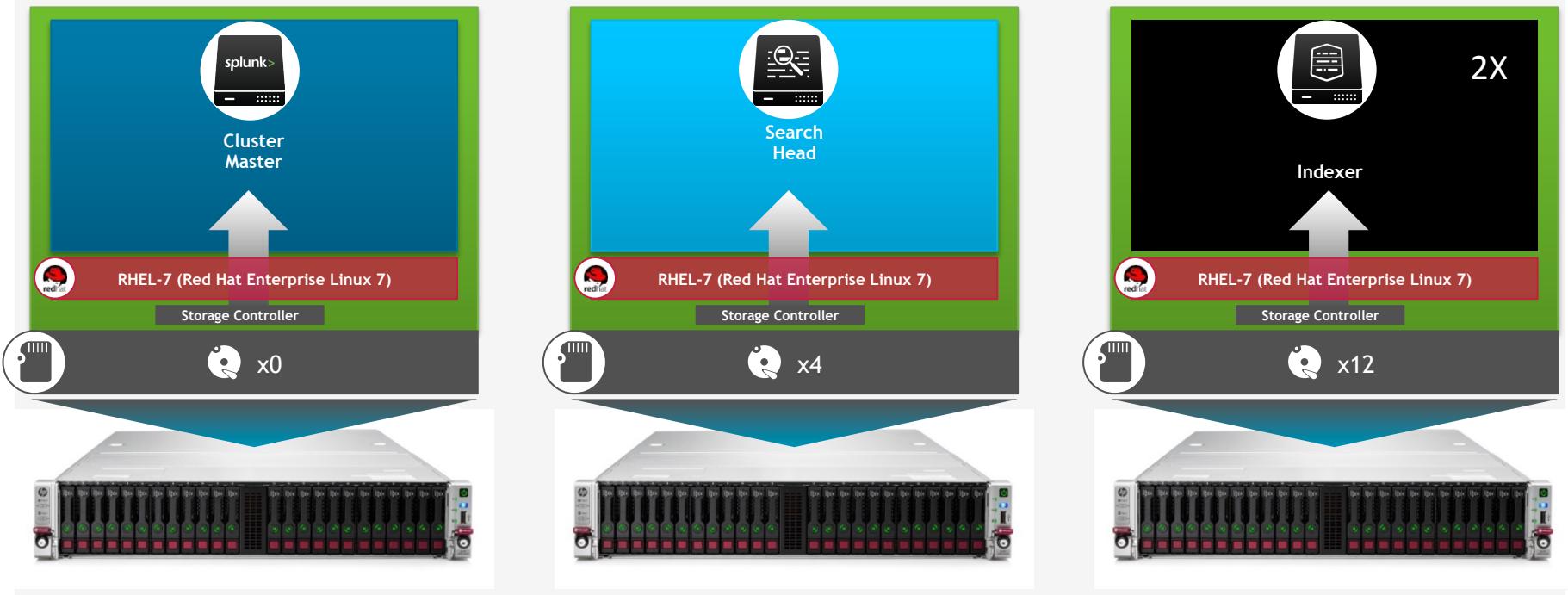


High Level Architecture



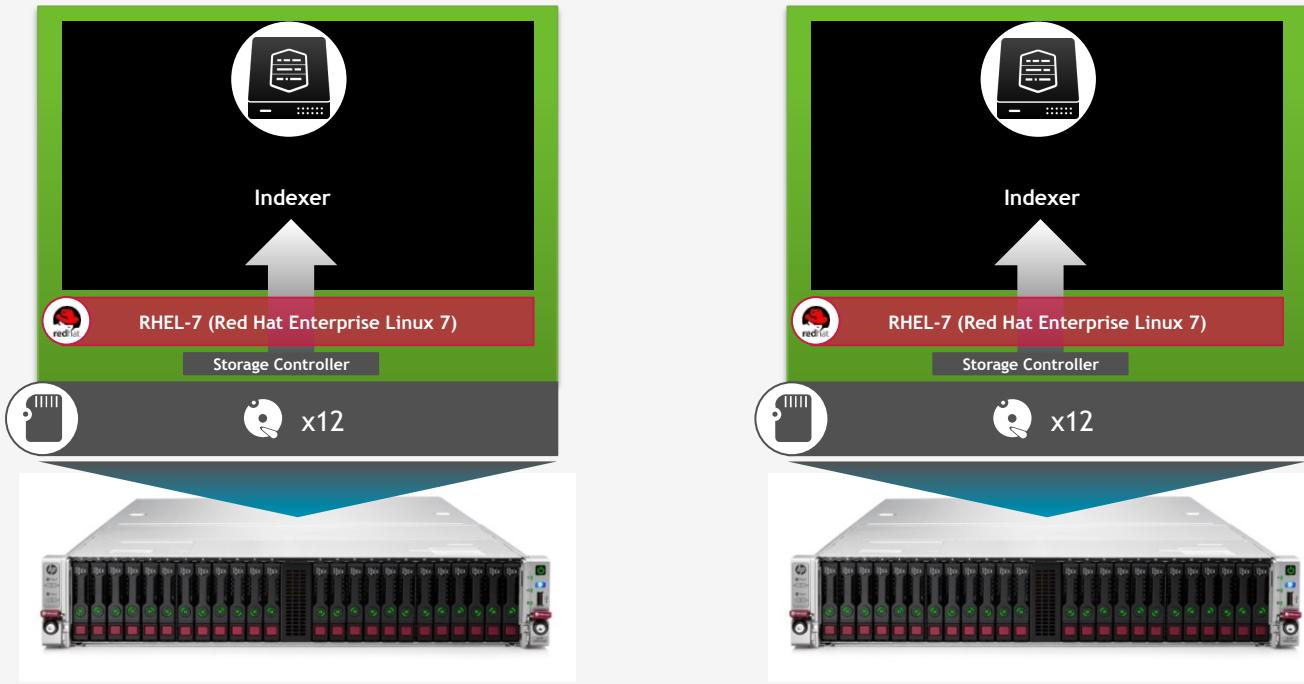
Service Node Hardware

Reference Platforms – Base Deployment



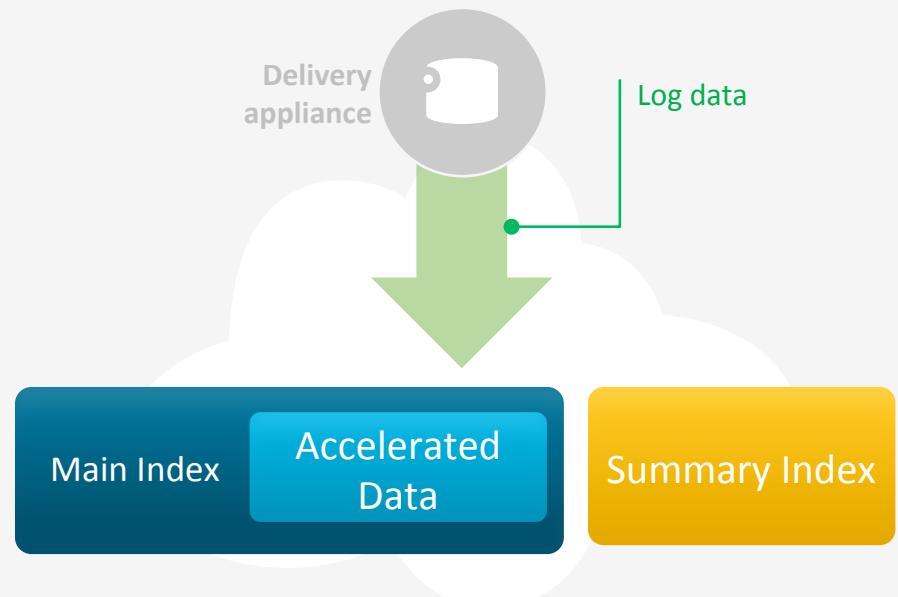
Service Node Hardware

Reference Platforms – Scaled Deployment

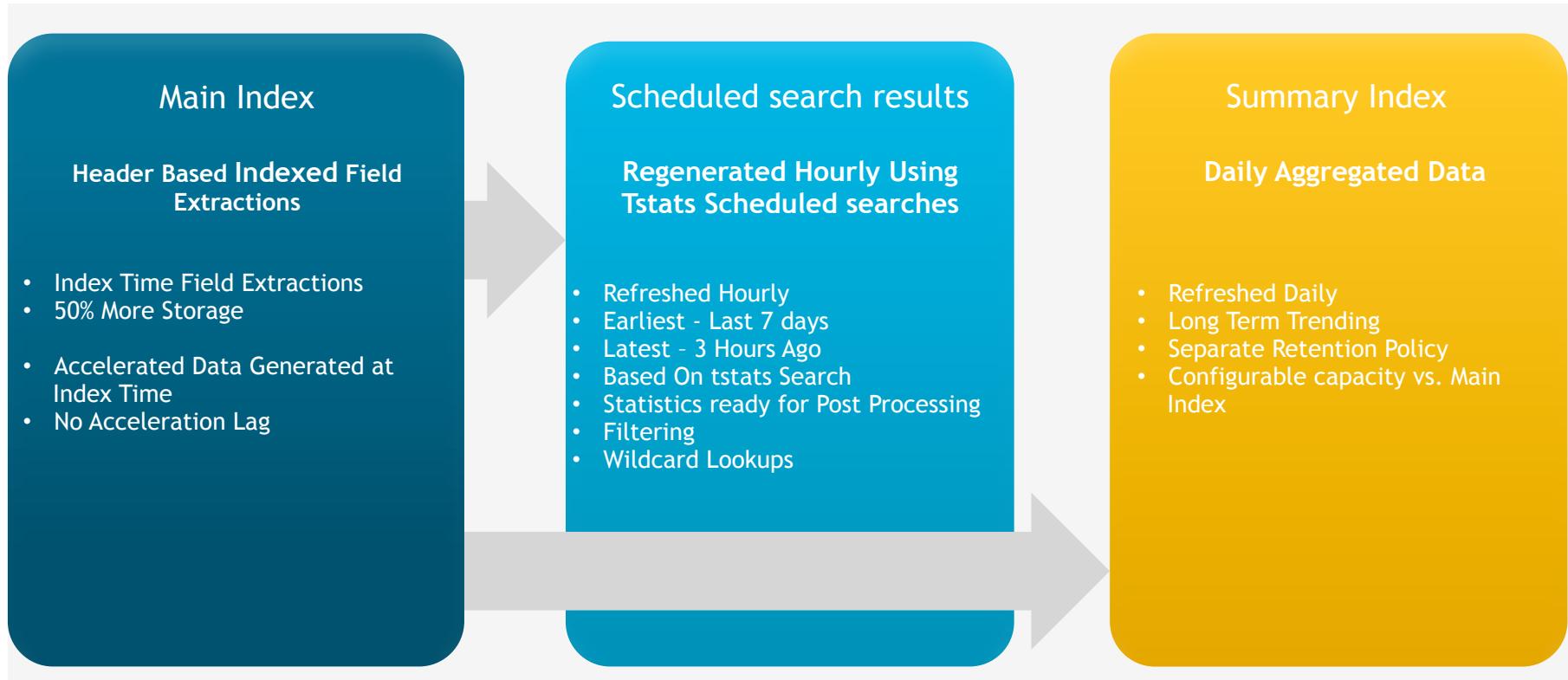


Reporting Data Indexing & Retention

- Raw log data stored in main index
 - Allows for flexible time resolution in reports
 - Storage space consumed is directly related to quantity of delivery traffic and streaming technology used
- Daily summaries are compiled on a daily basis
 - Generated after 2 days to allow for late-arriving data from Delivery Appliances
 - Searchable after 3 days to allow for generation
- Configurable retention policy
 - main vs summary index



Reporting Data Phase 1



High Performance Reporting Phase 1



Reporting Data Indexing Phase 2

Main Index

Search Time Field Extractions

- No Indexed Extractions
- 50% Less Storage

Accelerated Data Models

This is generated continuously, as new logs arrive, maintained alongside the main index

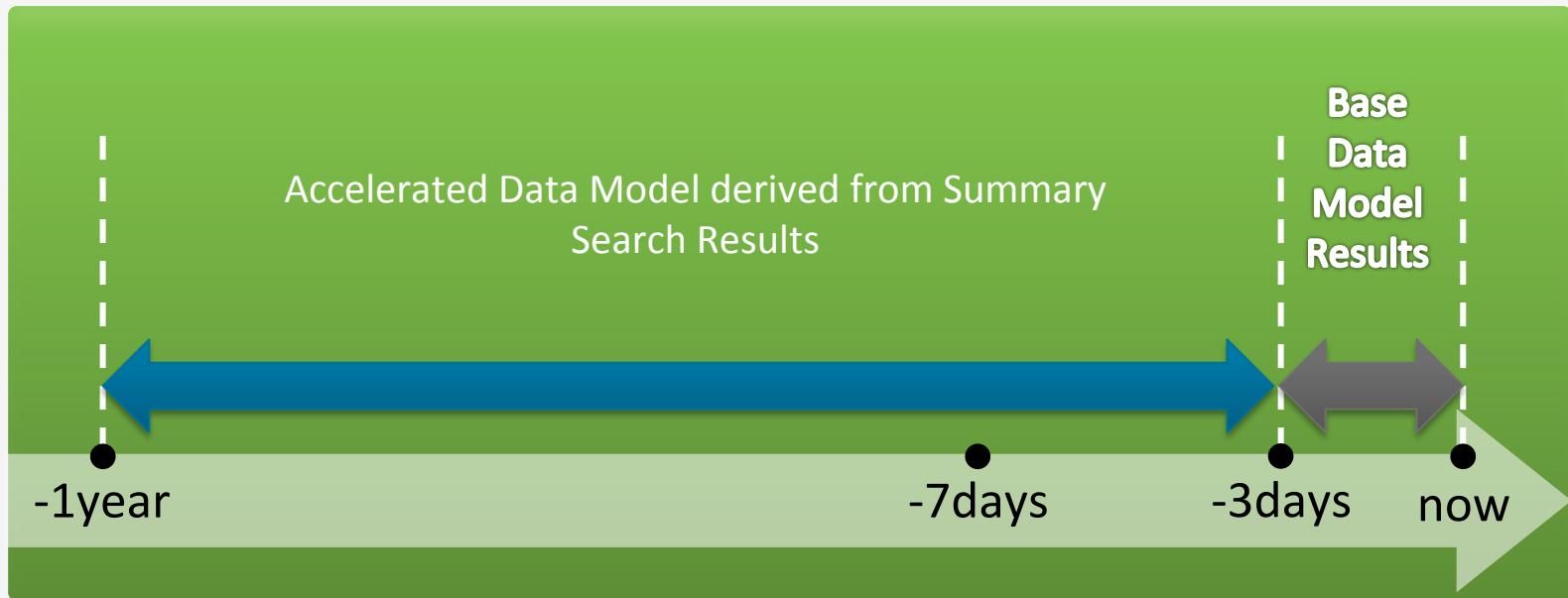
- Simplified Searches
- Lookups and translations accelerated
- Superfluous information is removed
- Summary Index results are also data modelled to provide consistent translations for the reporting API.

Summary Index

Daily aggregated data

- Refreshed Daily
- Long Term Trending
- Separate Retention Policy
- Configurable capacity vs. Main Index

High Performance Reporting Phase 2



Summary

- Accelerated project delivery
- Reporting capabilities exceeded expectations
- Search complexity abstracted away from users by API wrapper
- Stable, scalable and self monitoring
- Further Information:
Eric Henderson
Senior Product Manager
Eric.Henderson@alcatel-lucent.com



.conf2015

THANK YOU

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