Nick Murray - Data Product Design at Salesforce

The following screenshots showcase my work at Salesforce from 2019-2021. For any questions or other materials, please don't hesitate to contact me directly:

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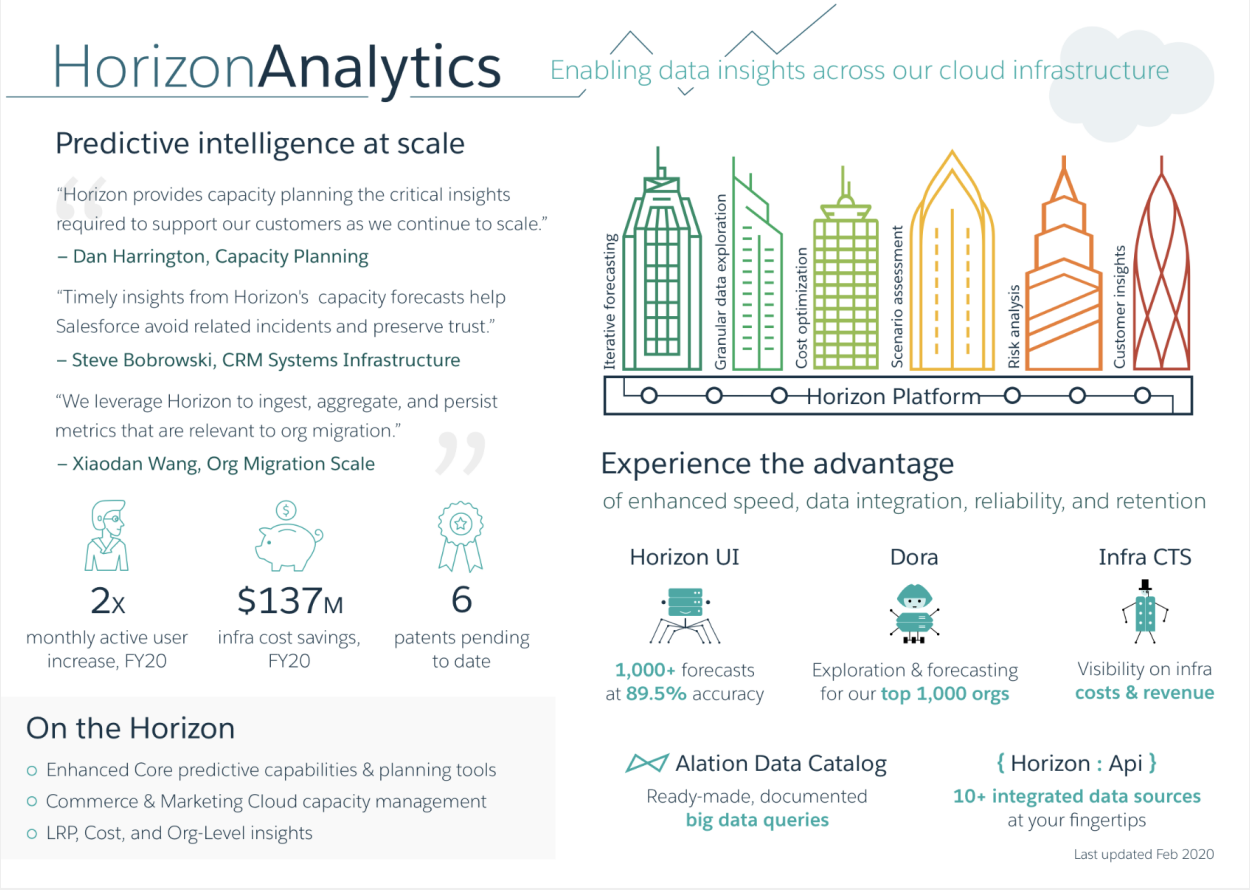
(917)-386-3609
http://nickm.io

Horizon Analytics - My Team at Salesforce

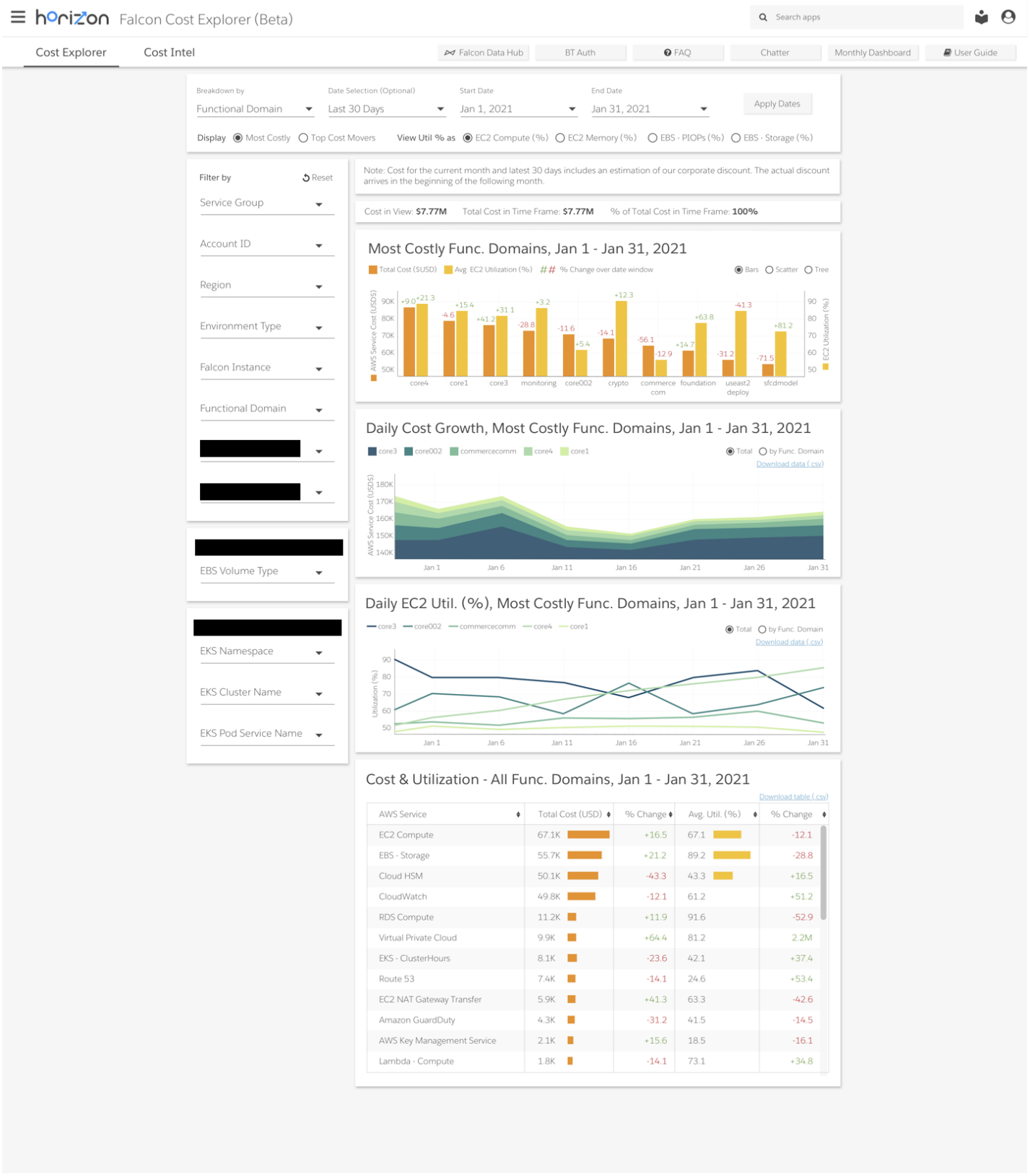
Our team delivers internal data products to thousands of infrastructure planners, executives, and engineers to ensure that Salesforce, its acquisitions, and any customer-developed apps function seamlessly in the cloud.



Team showcase infographic by Nick Murray, Feb 2020

Falcon Cost Explorer - Actively Managing Cloud Infrastructure Costs, Jan 2021

Purpose: Enable engineers in partnership with finance professionals to proactively grow the cost-efficiency of our cloud infrastructure fleet.



horizon Falcon Cost Explorer (Beta)

Search apps

Cost Explorer | Cost Intel | Falcon Data Hub | BT Auth | FAQ | Chatter | Monthly Dashboard | User Guide

Breakdown by: Functional Domain | Date Selection (Optional): Last 30 Days | Start Date: Jan 1, 2021 | End Date: Jan 31, 2021 | Apply Dates

Display: (•) Most Costly ( ) Top Cost Movers View Util % as: (•) EC2 Compute (%) ( ) EC2 Memory (%) ( ) EBS - PIOPs (%) ( ) EBS - Storage (%)

Filter by | Reset

Service Group

Account ID

Region

Environment Type

Falcon Instance

Functional Domain

[redacted]

[redacted]

[redacted]

EBS Volume Type

[redacted]

EKS Namespace

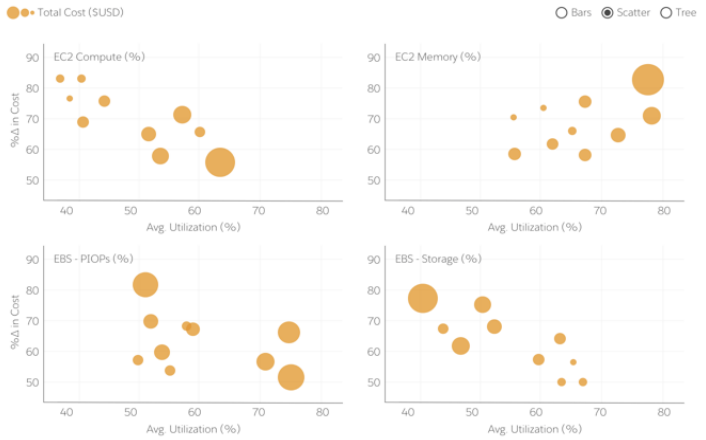
EKS Cluster Name

EKS Pod Service Name

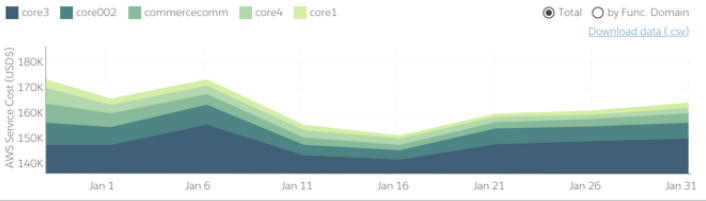
Note: Cost for the current month and latest 30 days includes an estimation of our corporate discount. The actual discount arrives in the beginning of the following month.

Cost in View: **$7.77M** Total Cost in Time Frame: **$7.77M** % of Total Cost in Time Frame: **100%**

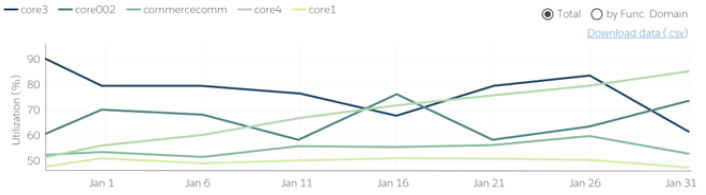
Most Costly Func. Domains, Jan 1 - Jan 31, 2021



Daily Cost Growth, Most Costly Func. Domains, Jan 1 - Jan 31, 2021



Daily EC2 Util. (%), Most Costly Func. Domains, Jan 1 - Jan 31, 2021



Cost & Utilization - All Func. Domains, Jan 1 - Jan 31, 2021

Download table (csv)

AWS Service	Total Cost (USD)	% Change	Avg. Util. (%)	% Change
EC2 Compute	67.1K	+16.5	67.1	-12.1
EBS - Storage	55.7K	+21.2	89.2	-28.8
Cloud HSM	50.1K	-43.3	43.3	+16.5
CloudWatch	49.8K	-12.1	61.2	+51.2
RDS Compute	11.2K	+11.9	91.6	-52.9
Virtual Private Cloud	9.9K	+64.4	81.2	2.2M
EKS - ClusterHours	8.1K	-23.6	42.1	+37.4
Route 53	7.4K	-14.1	24.6	+53.4
EC2 NAT Gateway Transfer	5.9K	+41.3	63.3	-42.6

horizon Falcon Cost Explorer (Beta)

Search apps

Cost Explorer | Cost Intel | Falcon Data Hub | BT Auth | FAQ | Chatter | Monthly Dashboard | User Guide

Breakdown by: Functional Domain | Date Selection (Optional): Last 30 Days | Start Date: Jan 1, 2021 | End Date: Jan 31, 2021 | Apply Dates

Display: (•) Most Costly ( ) Top Cost Movers | View Util % as: (•) EC2 Compute (%) ( ) EC2 Memory (%) ( ) EBS - PIOPs (%) ( ) EBS - Storage (%)

Filter by | Reset

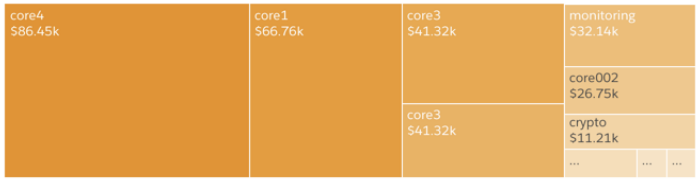
- Service Group
- Account ID
- Region
- Environment Type
- Falcon Instance
- Functional Domain
- [redacted]
- [redacted]
- [redacted]
- EBS Volume Type
- [redacted]
- EKS Namespace
- EKS Cluster Name
- EKS Pod Service Name

Note: Cost for the current month and latest 30 days includes an estimation of our corporate discount. The actual discount arrives in the beginning of the following month.

Cost in View: **$7.77M** Total Cost in Time Frame: **$7.77M** % of Total Cost in Time Frame: **100%**

Most Costly Func. Domains, Jan 1 - Jan 31, 2021

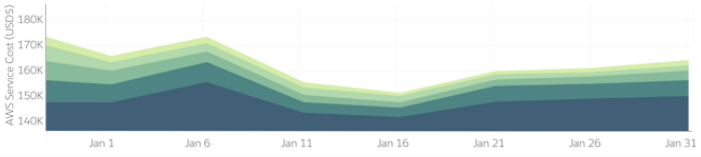
Total Cost ($USD) | ( ) Bars ( ) Scatter (•) Tree



Daily Cost Growth, Most Costly Func. Domains, Jan 1 - Jan 31, 2021

core3 core002 commercecomm core4 core1 | (•) Total ( ) by Func. Domain

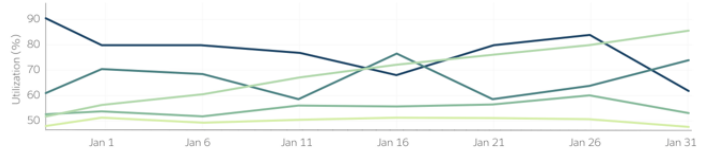
Download data (.csv)



Daily EC2 Util. (%), Most Costly Func. Domains, Jan 1 - Jan 31, 2021

core3 core002 commercecomm core4 core1 | (•) Total ( ) by Func. Domain

Download data (.csv)



Cost & Utilization - All Func. Domains, Jan 1 - Jan 31, 2021

Download table (.csv)

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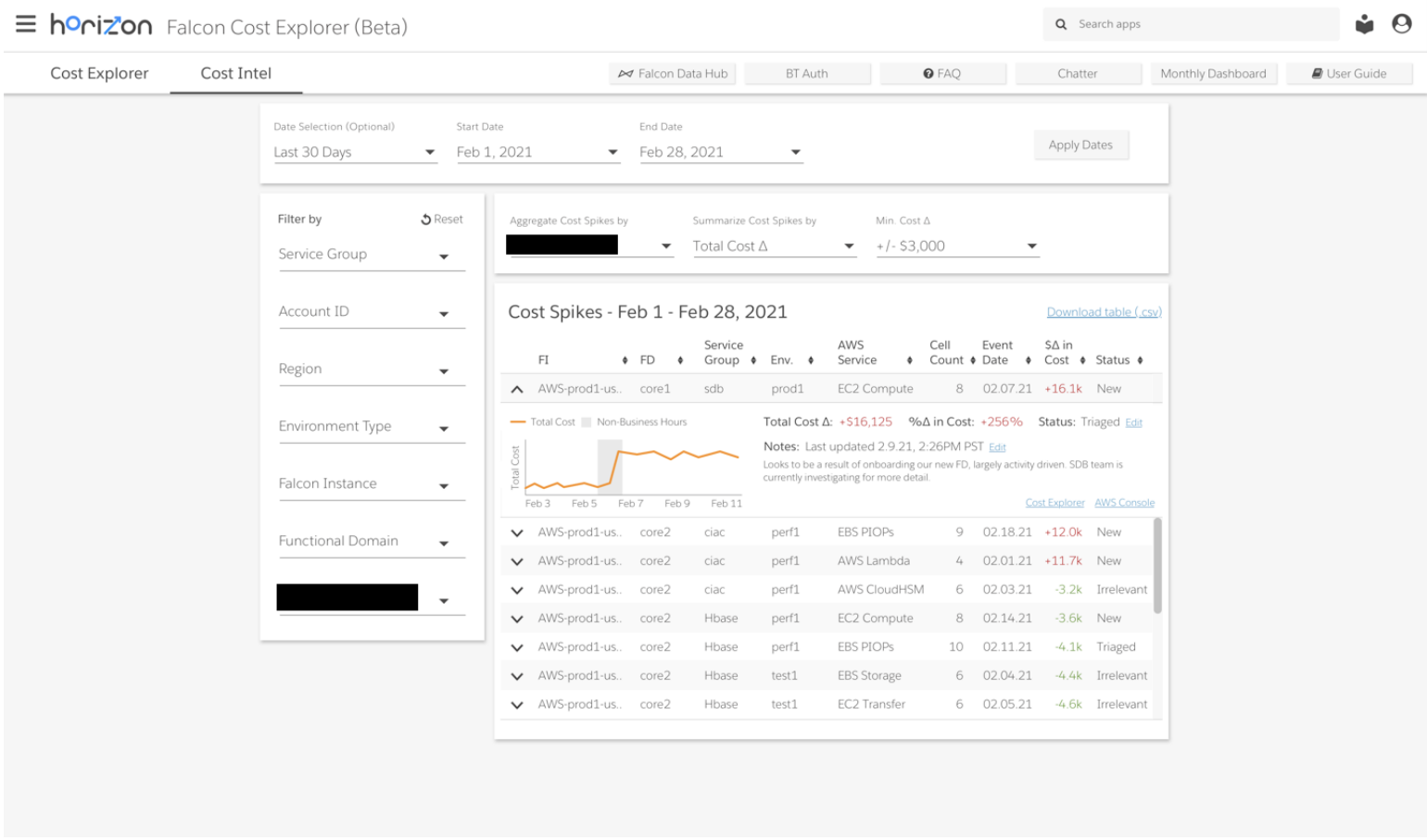
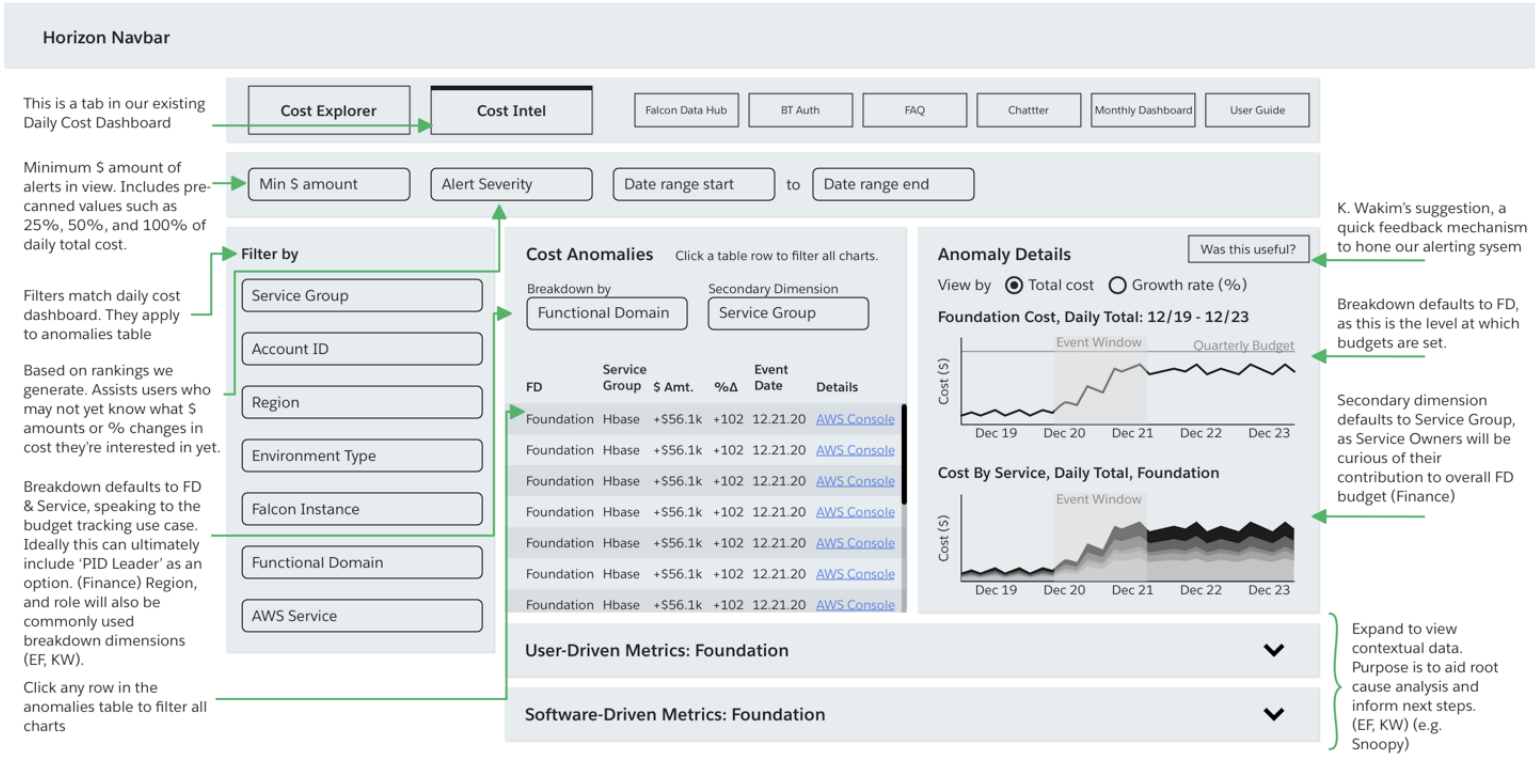
Route 53	7.4K	-14.1	24.6	+53.4
EC2 NAT Gateway Transfer	5.9K	+41.3	63.3	-42.6
Amazon GuardDuty	4.3K	-31.2	41.5	-14.5
AWS Key Management Service	2.1K	+15.6	18.5	-16.1
Lambda - Compute	1.8K	-14.1	73.1	+34.8

Cost Intel - Anomaly Detection within Falcon Cost Explorer, Feb 2021



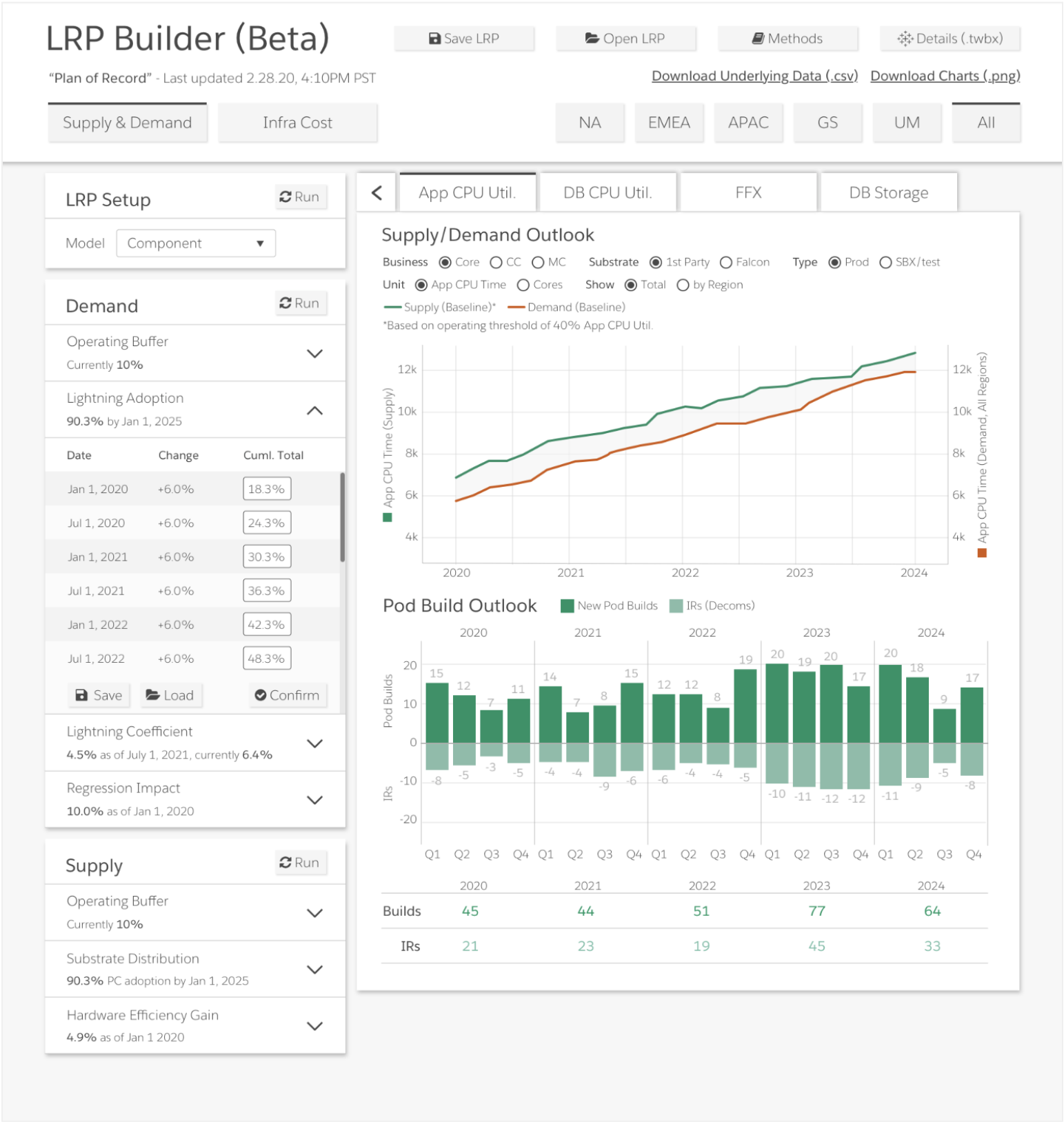
Cost Alerting Wireframe v1

Purpose: Interface to communicate relevant cost anomalies, & their impact on FD-level budgets. 'User Driven' and 'Software Driven' metrics designed to support decisions on how to respond to any observed anomalies



LRP Builder - Long Term Infrastructure Build Planning, Jul 2020

Purpose: Enable executives and capacity planners to run infrastructure build scenarios, to support the development of our infrastructure long range plan (LRP).



LRP Builder (Beta)

Save LRP | Open LRP | Methods | Details (.twbx)

"Plan of Record" - Last updated 2.28.20, 4:10PM PST

Download Underlying Data (.csv) Download Charts (.png)

Supply & Demand | Infra Cost

NA | EMEA | APAC | GS | UM | All

LRP Setup

Run

Model: Component

Demand

Run

- Operating Buffer — Currently **10%**
- Lightning Adoption — **90.3%** by Jan 1, 2025
- Lightning Coefficient — **4.5%** as of July 1, 2021, currently **6.4%**
- Regression Impact — **4.1%** as of Feb 1, 2022, currently **10.0%**

Supply

Run

- Operating Buffer — Currently **10%**
- Substrate Distribution — **90.3%** PC adoption by Jan 1, 2025
- Hardware Efficiency Gain — **4.9%** as of Jan 1 2020

Date	Value
Jan 1, 2020	4.9%

Save | Load | Confirm

App CPU Util. | DB CPU Util. | FFX | DB Storage

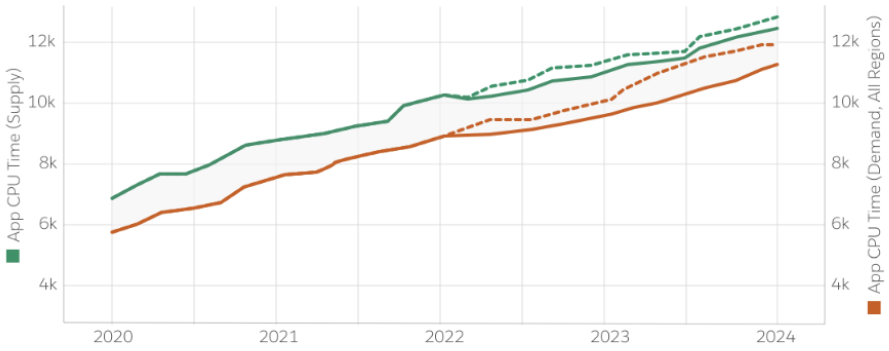
Supply/Demand Outlook

Business: Core CC MC | Substrate: 1st Party Falcon | Type: Prod SBX/test

Unit: App CPU Time Cores | Show: Total by Region

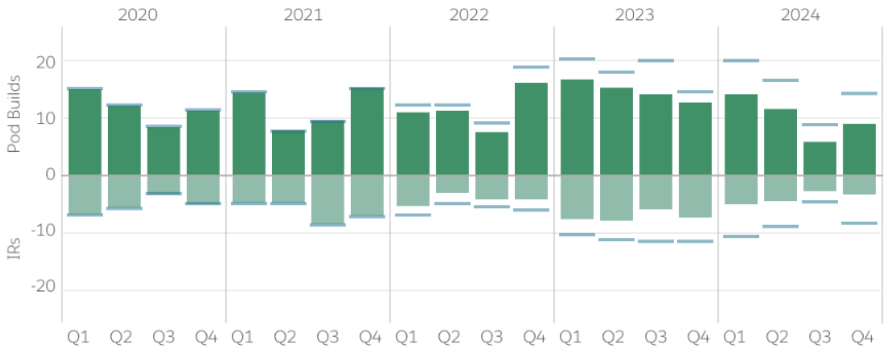
Supply (Baseline)* Supply (Scenario)* Demand (Baseline) Demand (Scenario)

*Based on operating threshold of 40% App CPU Util.



Pod Build Outlook

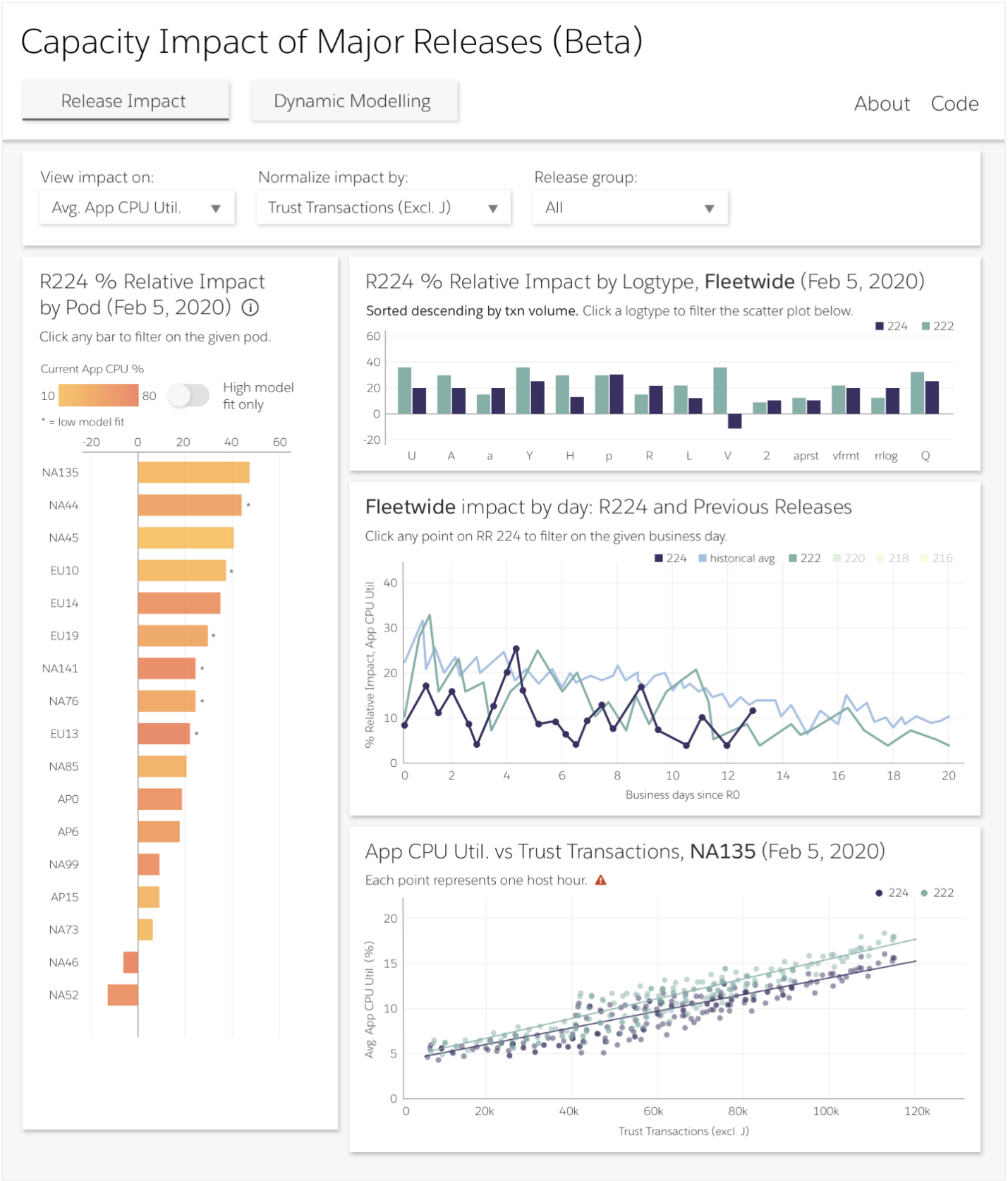
New Pod Builds IRs (Decoms) Baseline



	2020	2021	2022	2023	2024
Builds	45	44	46 (51)	58 (77)	45 (64)
IRs	21	23	15 (19)	32 (45)	25 (33)

Automated Release Regression Analysis, Feb-March, 2020

Purpose: Enable performance engineers at Salesforce to monitor the impact of new software releases on our infrastructure fleet, informing real-time performance tuning efforts.



Dynamic Modelling across Date Windows

Release Impact | Dynamic Modelling | About | Code

View impact on: Avg. App CPU Util.

Normalize impact by: Trust Transactions (Excl. J)

Date Window A*: 2/10/19 - 2/24/19

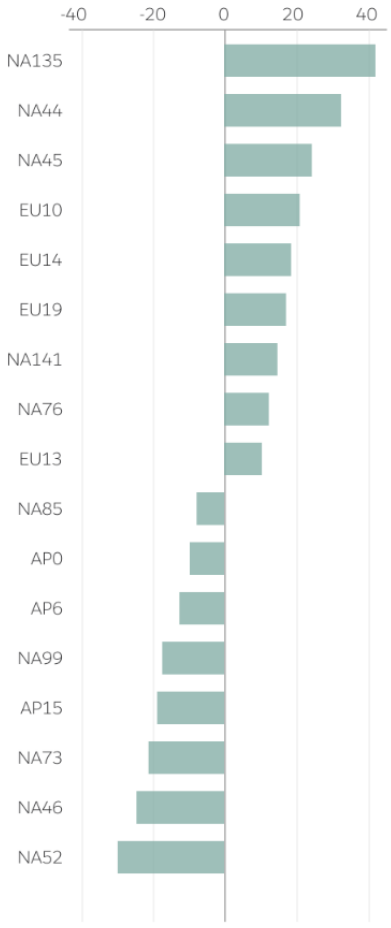
Date Window B*: 11/2/19 - 11/16/19

*Business hours only

% Diff in Avg. App CPU Util. per Txn, all Logtypes

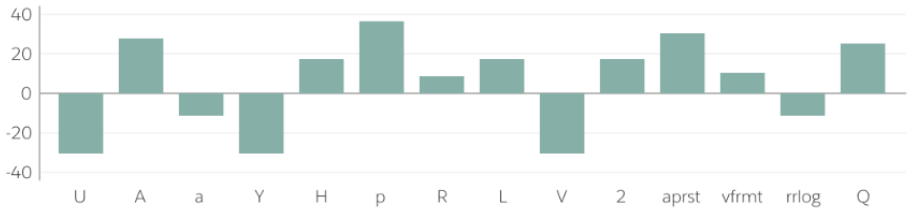
Click any bar to filter on the given pod.

High model fit only



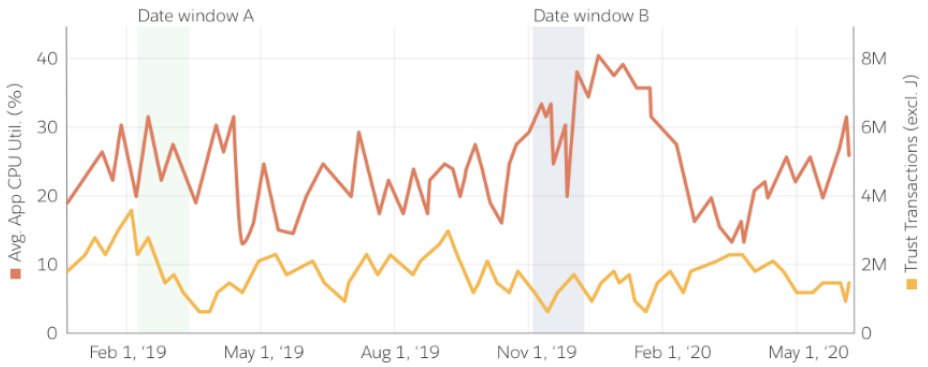
% Diff in App CPU Time per Txn, by Logtype, R0

App CPU Time sourced from app logs. Click any logtype to filter the charts below.



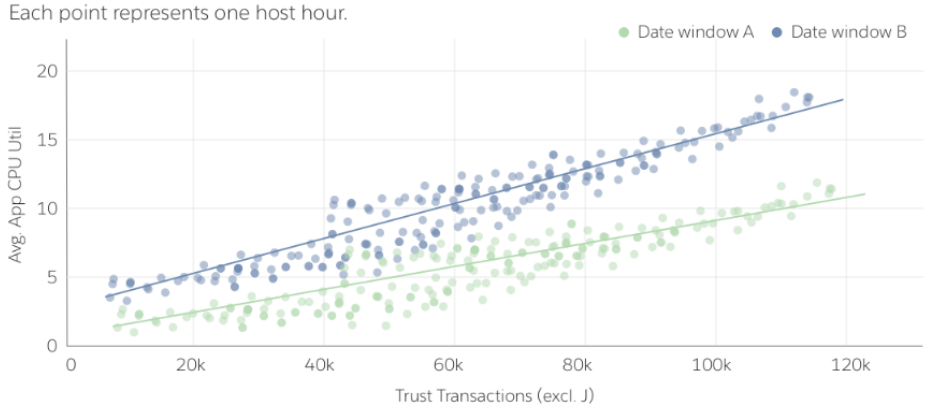
App CPU Util. vs Trust Txns, R0

Drag shaded areas to adjust date windows.



App CPU Util. vs Trust Txns, R0

Each point represents one host hour.



Sherlock - Anomaly Detection and Triage, Dec-Jan, 2020

Purpose: Enable capacity planners to detect, triage, and take action on any customer and/or software driven anomalies occurring across our fleet of infrastructure.

Sherlock *The anomaly detective.*

App CPU Time Anomalies

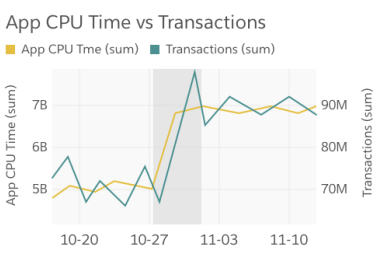
View: Sandbox | Prod | Busines Hours Only | Filter rows

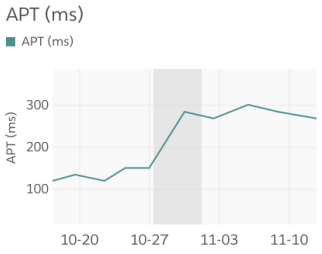
Severity	Pod	Type	Relationship	Start	End
High	NA7	Level shift	Transactions	10-28-19	10-30-19
High	EU15	Slope Δ	Org count	10-21-19	10-24-19
Med	EU10	Level shift	Release	11-09-19	11-10-19
Med	AP0	Spike	Release	09-30-19	10-02-19
Med	NA44	Slope Δ	Transactions	10-14-19	10-17-19

NA7 - Anomaly Details

App CPU time on NA7 experienced a **level shift updwards** between **Oct 28th and Oct 30th**. **Transactions** on the Pod also saw a level shift in this time period.

NA7 - Observed Level Shift & APT Impact

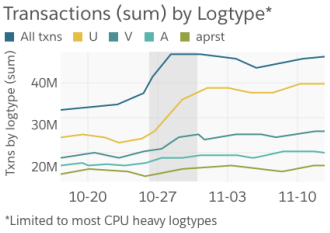




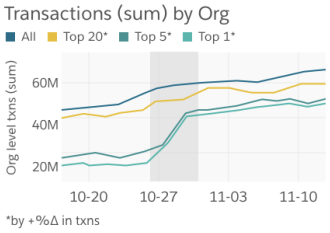
NA7 - Load Driving Metrics

Fastest growing orgs on NA7 (of top 20), by transactions

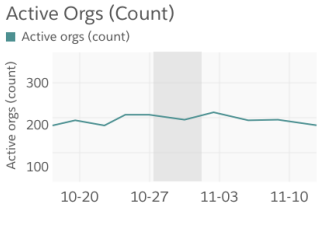
CANON MARKETING SERVICES	97.0%
Sirius Computing	74.0%
Younique	91.0%
Drift	73.0%
Chase Metals	46.0%



*Limited to most CPU heavy logtypes



*by +%Δ in txns

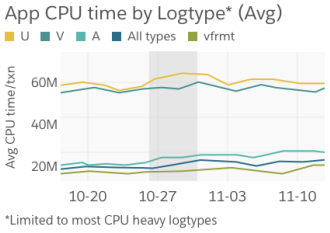


NA7 - Software Driving Metrics

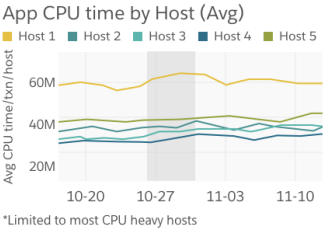
Transacting Hosts

Transacting hosts: 30

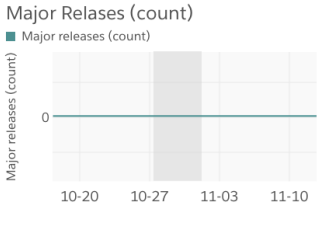
DELL - POWEREDGE... 17.1 SSKUC:	27
DELL - POWEREDGE... 17.2 SSKUC:	3



*Limited to most CPU heavy logtypes

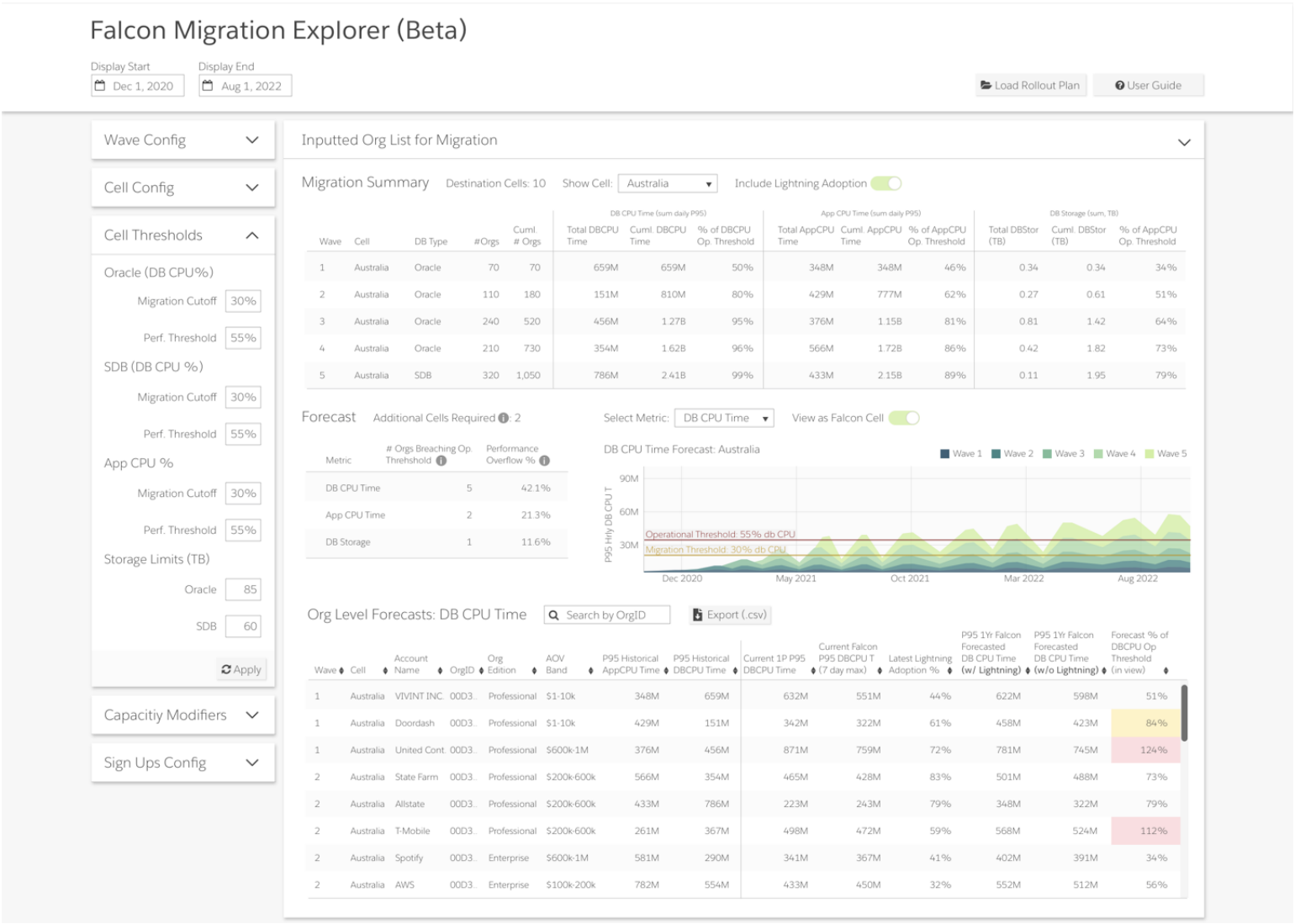


*Limited to most CPU heavy hosts



Falcon Migration Explorer - Scenario Forecasting for Effective Customer Migration, Jun 2020

Purpose: Enable executives and capacity planners to effectively tweak, run, and review forecasted customer migration scenarios, to support the smooth transition of our users to more efficient, reliable cloud environments.



Falcon Migration Explorer (Beta)

Forecast Start: Aug 1, 2020 | Forecast End: Apr 1, 2022

In view: **Version A**. Last Updated **08.12.2020** - 05:30:01 GMT

Save Scenario | Load Scenario

Wave Config

Falcon Cell Config

Not slated for MVP

Cell Template 1 + −

AWS Region: Mumbai

DB InstanceType: R5.24XL

Not slated for MVP

Cells/FD	7
FDs/FI	12
App Hosts/Cell	12
#Oracle Cells (Prod)	1
#SDB Cells (Prod)	0
#SDB Cells (SBX)	2
Gear Ratio: SDB - Oracle	2.5

Save | Load | Apply

Cell Thresholds

AWS-southap1 | AWS-useast1

Org List for Migration - 235 Total Orgs

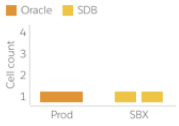
Migration Summary

Click a cell in the chart to filter the charts below.

Destination Cells: 1

Orgs Breaching Capacity: 0

Additional Cells Required: 0

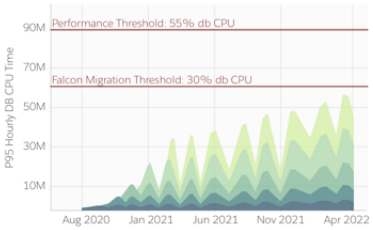


Wave	Cell ID	Status	AOV	#Orgs	Total Pk Hr DBCPU Time	% of DB CPU Threshold	% of DB Stor. Threshold
1	M1.Or	Complete	$2.7M	10	0.25M	4.3%	50%
2	M1.Or	Complete	$7.8M	25	2.0M	12.7%	80%
3	M1.Or	In progress	$11.3M	43	3.8M	36.2%	95%
4	M1.Or	Pending	$21.5M	65	8.2M	61.5%	96%
5	M1.Or	Pending	$36.4M	92	9.3M	91.2%	93%

Cell Utilization Forecast: Aug 1, 2020 - Apr 1, 2022

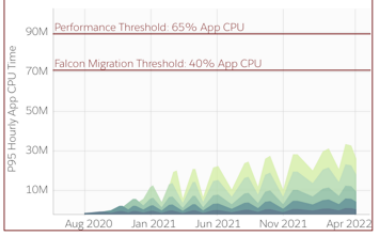
Wave 1 | Wave 2 | Wave 3 | Wave 4 | Wave 5

DB CPU Time: Cell M1.Or



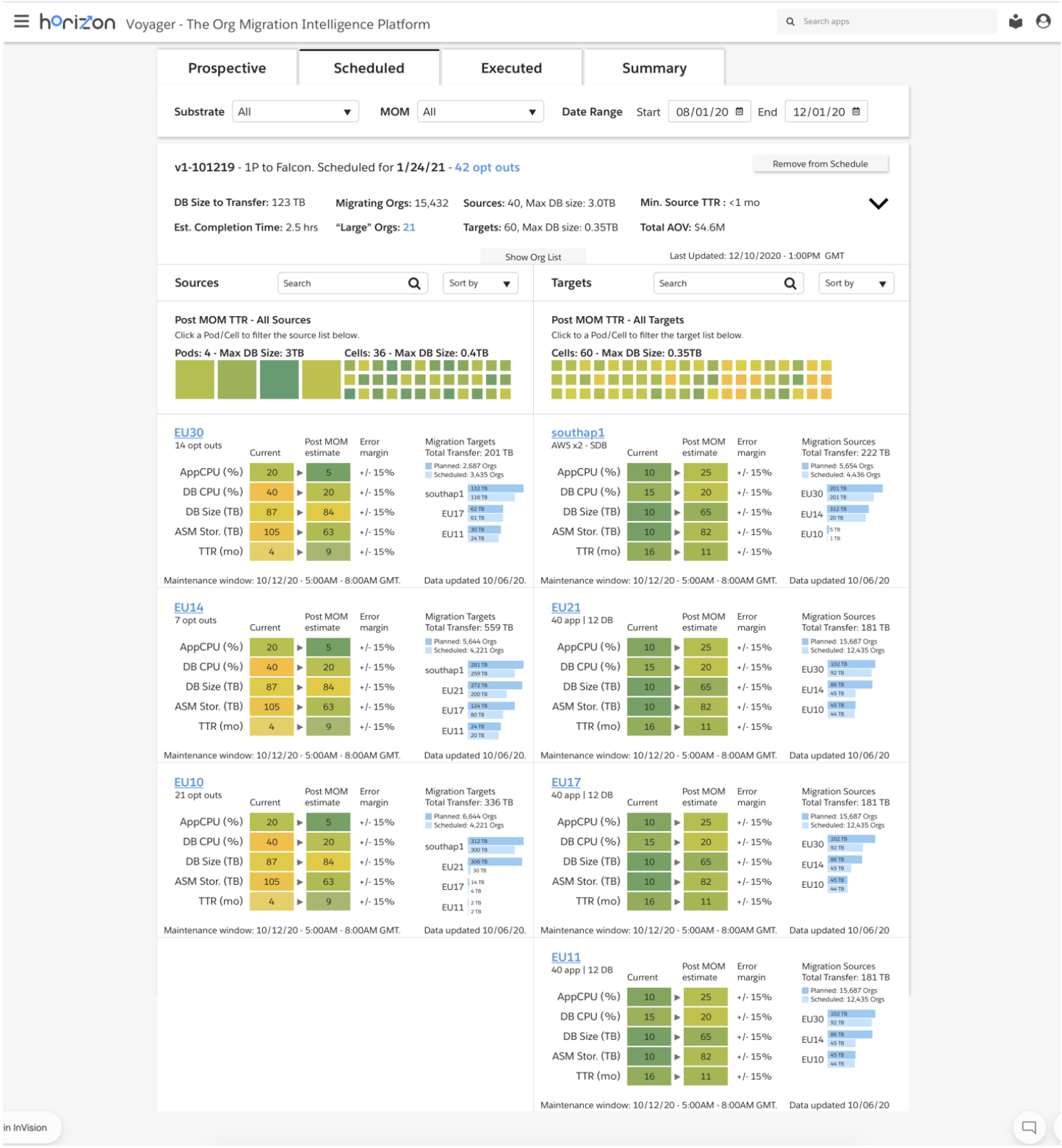
Not slated for MVP

App CPU Time: Cell M1.Or



Voyager - Managing Customer Cloud Migration, Nov 2019

Purpose: Enable customer-centric engineers to effectively manage the migration of Salesforce customers to new cloud infrastructure of ever increasing performance, security, and reliability.



Pending | Scheduled | Executed | Summary

MOM All ▼ Date Range Start 11/01/18 End 10/31/19

MOM Performance Summary

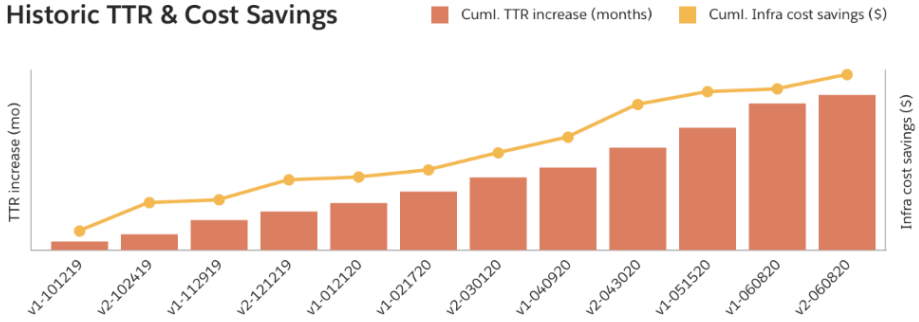
Impact

Cumulative Impact

147 months
Fleetwide TTR Increase

$16.2M
Total Infra Cost Savings

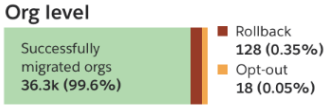
Historic TTR & Cost Savings



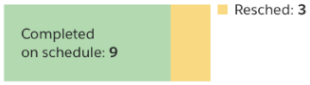
Success

Overall Migration Success

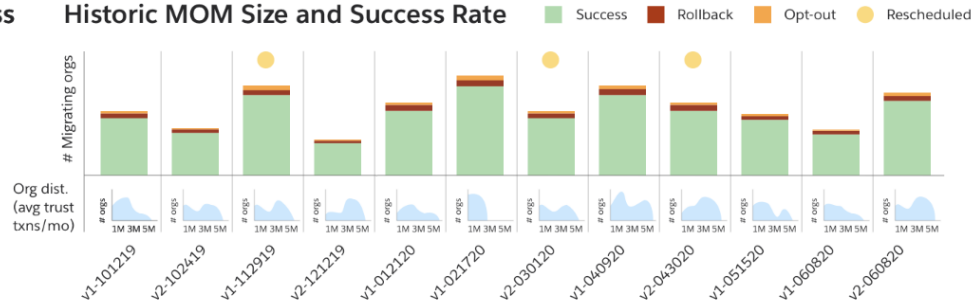
Org level



MOM level



Historic MOM Size and Success Rate



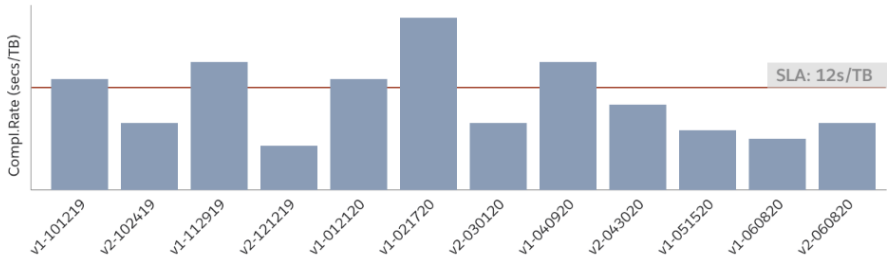
Efficiency

Avg. Migration Efficiency

7.48 secs/TB
Fleetwide Avg. Completion Rate

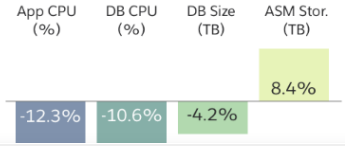
104%
of SLA

Historic Completion Rate

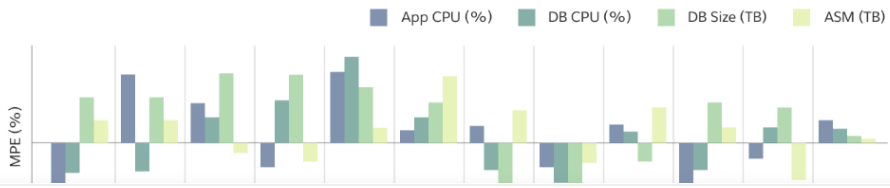


recast Accuracy

Avg. Forecast Accuracy (MPE*)



Historic Forecast Accuracy



‘MOM App’ for planning and scheduling MOMs

Click any ● to view the associated wireframe.

Three Views

S — Source View

- Select Sources to remediate
- Review projected impact to any Source
- Edit org lists provided by OME, or upload them manually
- For any Source, edit org list, and re-run OME to finalize targets

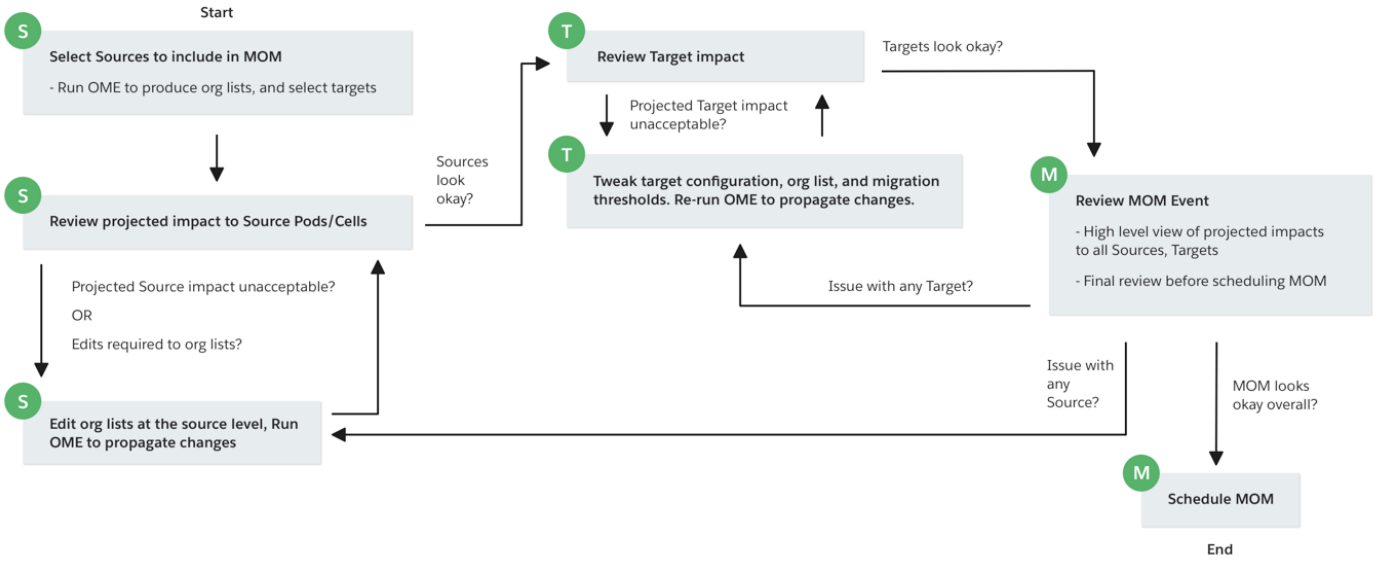
T — Target View

- Review projected impact to any individual Target. OME handles all Target selection
- Edit incoming org list, Target configuration, and migration thresholds. Re-run OME to propagate changes.
- Review org list migrating to any individual Target

M — MOM Event View

- Read only review of aggregate impact across Sources and Targets
- Make any necessary edits from Source and Target views
- When satisfied, schedule MOM.

User Journey



Back to Flow

Source View

Purpose: Define MOM Sources, run OME to select Targets. Edit org lists based on OME output. User can: Edit org list migrating from each source, edit forecast date range, add a source, and re-run OME. Thresholds only editable from the 'Target' view

Horizon Navbar

View by ◯ MOM Event ◯ Target ◉ Source | Date Range | Substrate | MOM ID

+ Add Source | Run OME for all Sources

Static chart, unaffected by user input to forecast date range. Becomes multi-line chart in cases with more than one binding metric

EU15

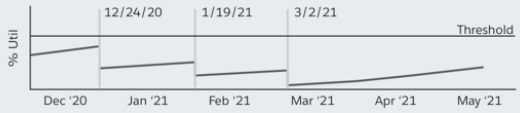
Total Migrating Orgs: 11,231

Total AOV: $2.45M

TTR: 1 mo

Next MOM Date: 12/24/20

Binding TTR Metric: App CPU %



New Org List (.csv)

Re-run OME

Remove Source

Last Updated: 11/10/2020 - 1:00PM GMT

User generated, though ultimately will be automated in OME. Includes OrgIDs, and migration dates. OME generates targert for each org. Replace by uploading new list and re-running OME.

Org List | Download Org List (.csv)

Expand to view full org list

Determines forecast date range in time series to the right

Forecast end date

End date

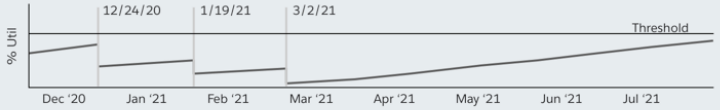
Generated automatically based on org list (org list includes migration dates)

Pending MOMs

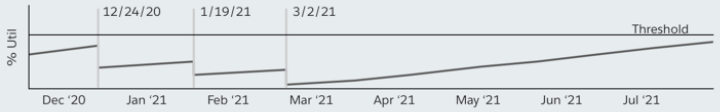
# Orgs	MOM Date	Target
2,342	12/24/20	southap1
1,465	01/19/20	southap1
4,561	03/02/21	southap1

Starting with binding TTR metric, more detailed charts, additional details TBD. X axes update based on user inputs to forecast date range

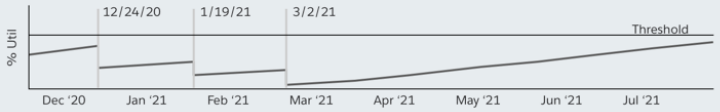
App CPU %: <Forecast Date Start> - <Forecast Date End>



DB CPU %: <Forecast Date Start> - <Forecast Date End>



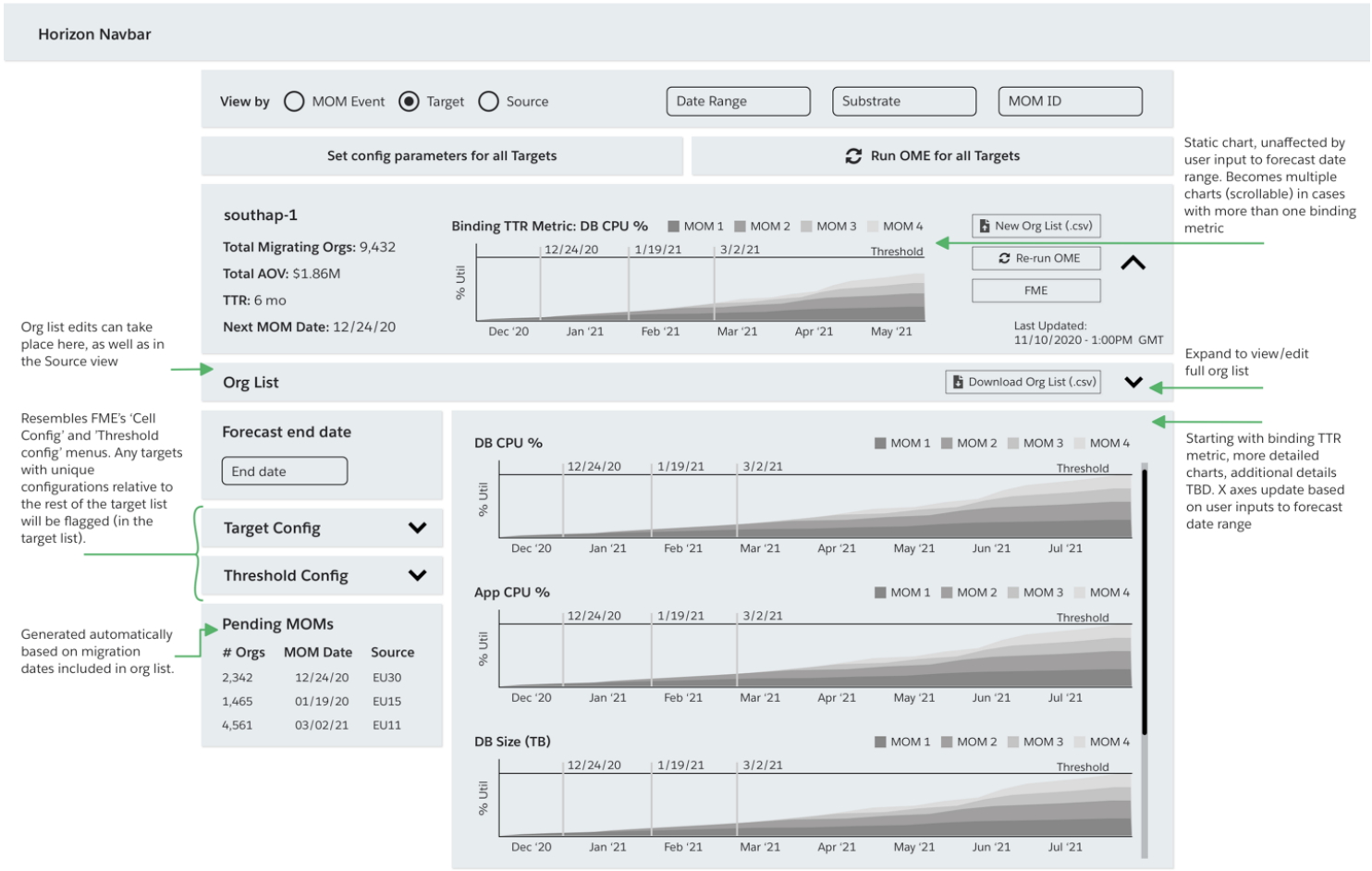
DB Size: <Forecast Date Start> - <Forecast Date End>



Back to Flow

Target View

Purpose: Review targets according to binding TTR metrics, edit target configuration, migration thresholds, and incoming org list. User can: Edit migration thresholds, edit cell/pod configuration, edit incoming org list, edit forecast date range, and re-run OME.



Static chart, unaffected by user input to forecast date range. Becomes multiple charts (scrollable) in cases with more than one binding metric

Org list edits can take place here, as well as in the Source view

Expand to view/edit full org list

Resembles FME's 'Cell Config' and 'Threshold config' menus. Any targets with unique configurations relative to the rest of the target list will be flagged (in the target list).

Starting with binding TTR metric, more detailed charts, additional details TBD. X axes update based on user inputs to forecast date range

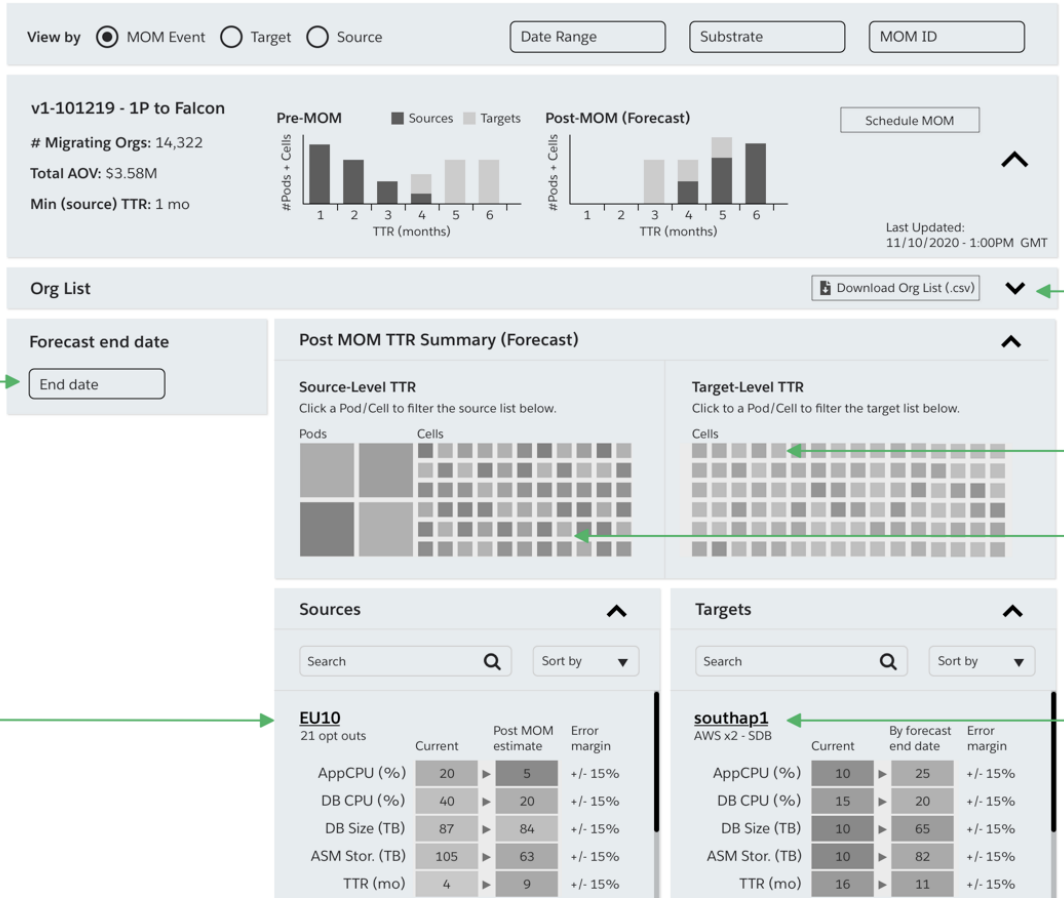
Generated automatically based on migration dates included in org list.

Back to Flow

MOM Event View

Purpose: High Level 'Cattle View' for review before scheduling MOM. Read Only. User can only edit forecast date range, and schedule MOM. All other edits happen on source or target views

Horizon Navbar



Affects the post MOM TTR Summary, and the forecasts provided at the source/ target level below it. View is almost entirely read only. No ability to edit org lists (this happens from the Source view). No ability to edit thresholds/cell config (this happens from the Target view)

Expand to view full org list. Read only. Edit via Source view

A herd of cattle. Click any pod/cell to filter the Target list below

Same for the source list, click any Pod/Cell to filter the list below

Click to link to source in app's Source view

Click to link to target in app's Target view