

CASE STUDY - IMPROVING THE CARBON BLACK CLOUD DASHBOARD

OVERVIEW

I had been working at Carbon Black for a few years and was part of many successful feature and product improvement launches. Late Summer of 2020 a team of us began working on an update to the primary dashboard for the overall product. This would prove to be one of my most challenging projects to date.

The Carbon Black Cloud product protects endpoints (computers, servers, etc.) from cyber attacks of many types. Malware, Ransomware, Trojans, etc. It does this via a sensor on the endpoint that will alert the CB user of a suspected compromise and allow an Analyst or Threat Hunter to take action.

The Carbon Black dashboard is meant to be a digest highlighting what might be happening now and over time within the product. Alerts, new compromise reports, disposition of the customer's endpoints, machines and software and which ones have the highest number of alerts. All these data points should be represented. Ideally customers could use this information to prioritize tasks and navigate quickly and easily to those that are considered critical.

The team was tasked with an entire overhaul of the Carbon Black Cloud dashboard. This would include; new and improved dashboard "widget" designs, new widget capabilities, and a new dashboard framework.

THE PROBLEM WITH THE CBC DASHBOARD

- The Carbon Black dashboard was seen by our customers as largely inadequate because of a lack of meaningful widgets available with actionable data
- Rather than being used as a starting point, it was clear, using analytics, that users generally skipped the dashboard and moved directly to a navigational element
- Widgets were largely static without the ability to filter by time or other dimensions
- Data visualizations were not interactive and limited. Visualizations needed optimization to better communicate information and trends quickly and effectively
- The dashboard export was a .csv file, lacking the executive reporting needed to show the product's effectiveness at a glance, across a specific time period
- The sales team felt the dashboard lacked any visual appeal. During demos they felt the need to quickly bypass the page. Difficult, as the page was the first thing users see when logging in.

GOALS FOR THE CBC DASHBOARD

- Add value for customers by providing efficient ways to enter task workflows using the dashboard
- Help prioritize which tasks users should perform by showing a variety of actionable data using updated and new dashboard widgets
- Add the capability to filter the entire dashboard by time period and filter individual widget data independently
- Use High Charts software to improve data visualization fidelity and increase interactivity
- Improve dashboard export features by providing a more granular .csv file and add .pdf export for executive reporting
- Create a more visually appealing version of the dashboard to use as a starting point for sales and demonstrations
- Add dashboard customization features to better present the correct information in a way that meets our user's needs

THE DASHBOARD AUDIENCE

For this project Milestone, we decided to begin our focus with the CBC Persona, Adam.

Adam - The Security Analyst. This persona represents the most common daily user of the Carbon Black Cloud.

His tasks require constant monitoring of the CBC console. The dashboard could be a valuable entry point if it met his needs of increased data visibility and greater efficiency.



THE DASHBOARD REDESIGN TEAM

Members from various UX, development, and product roles were asked to participate in defining the problem. This was achieved via design jams, internal stakeholder interviews with Sales Engineers, and customer surveys sent to members of the Carbon Black Design Advisory Group. We discussed the scope of reimagining the front door of the site, the technical and resource limitations we had, and what we hoped to achieve with the final work.

After these beginning stages, a smaller but still robust team was engaged with the day to day work of the initiative. Members of the team entered and exited the project at different points as defined by need. However, my fellow designer, Derek Sacks, and I were able to participate in the project for its duration. Trading lead design duties based on our other projects and relative strengths. Mostly, we collaborated as much as we could.

STEPHANIE TANZER - PRODUCT MANAGER
PAIGE SCHMIDT - PRODUCT MANAGER
PAUL ALBERT - ENGINEERING MANAGER
SPENCER NOWAK - FRONT END DEVELOPER
PARVEZ HUSAIN - FRONT END DEVELOPER
SOPHIA WEISMAN - UX RESEARCHER
MARISSA KEECH - UX RESEARCHER
NANCY QUATCH - UX RESEARCHER
KRISTINA ROMANO - UX CONTENT WRITER
DEREK SACKS - UX DESIGNER
MARK MADDEN - UX DESIGNER

FIRST STEPS

The first thing we needed were benchmark KPIs for us to compare our progress against. Working with the research team we collected data in two ways.

First, Google Analytics was used to track clicks, and clickthroughs. Derek, the research team, and I picked out the KPIs we thought would give us a reasonable barometer of our success. We hoped to increase clicks on dashboard elements, time on page, and identify where users went after landing on the dashboard

Secondly, we wanted to conduct a heuristic evaluation to add some starting measures of qualitative data. How well did the current dashboard meet our users needs? How easy was it to use? We had feedback, but needed a way to measure usage today vs. future interaction with the page.

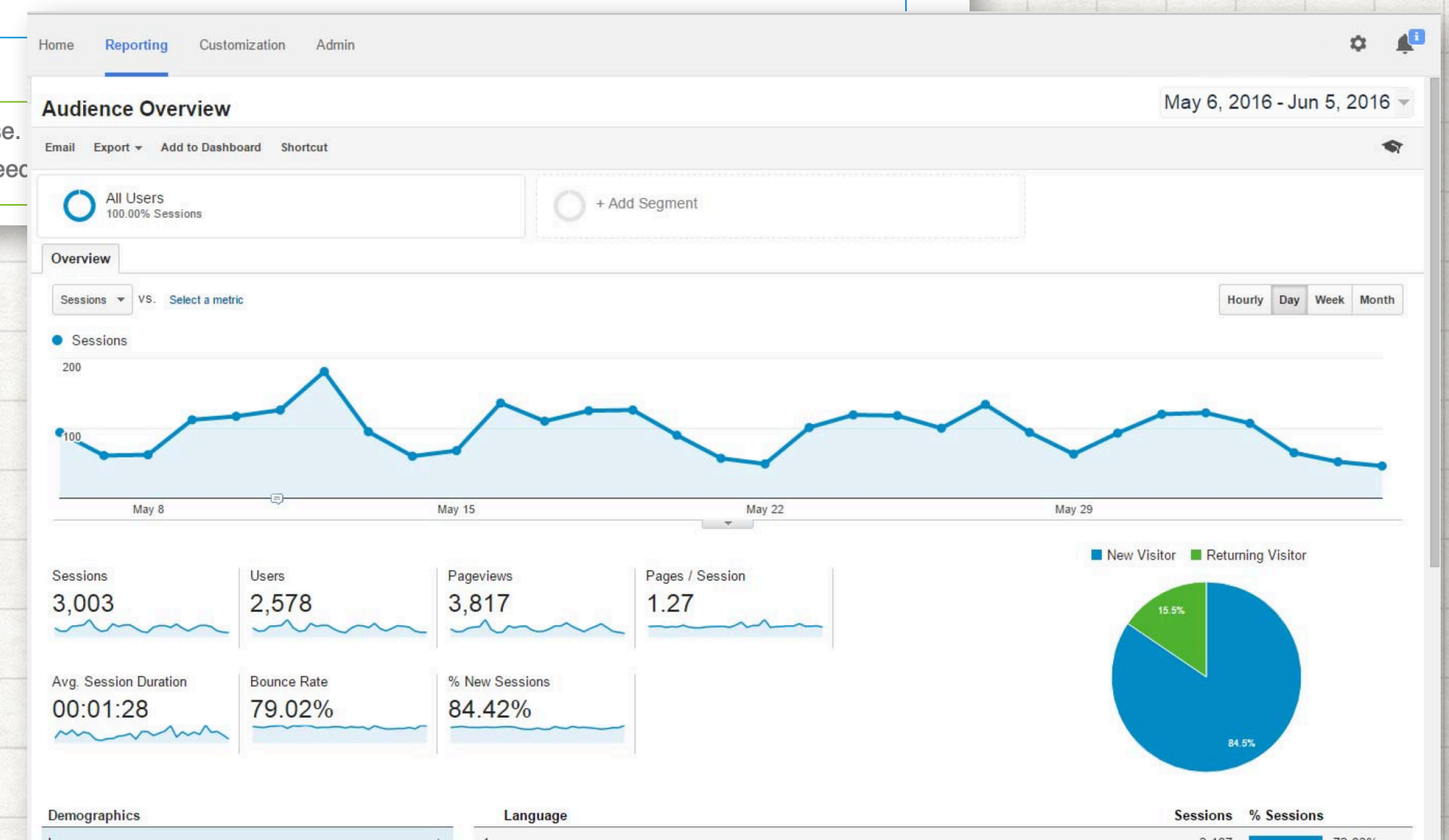
Statements Used for Scoring

Heuristics - Principle Statements

1. The dashboard has the information I need to assess my next step readily available.
2. I do not need to remember any information to use the dashboard.
3. I understand the language that's used on the dashboard.
4. The terminology used on the dashboard is consistent with the terminology used in the industry.
5. I understand the information presented to me on the dashboard.
6. Visual indicators helped me understand how to use the dashboard.
7. Only relevant information is being shown to me on the dashboard.
8. The dashboard interface behaves in a manner such that I can accurately predict what will happen next.
9. It is clear what actions are available to me on the dashboard.

UMUX-Lite Statements

1. The dashboard is easy to use.
2. The dashboard meets my needs.

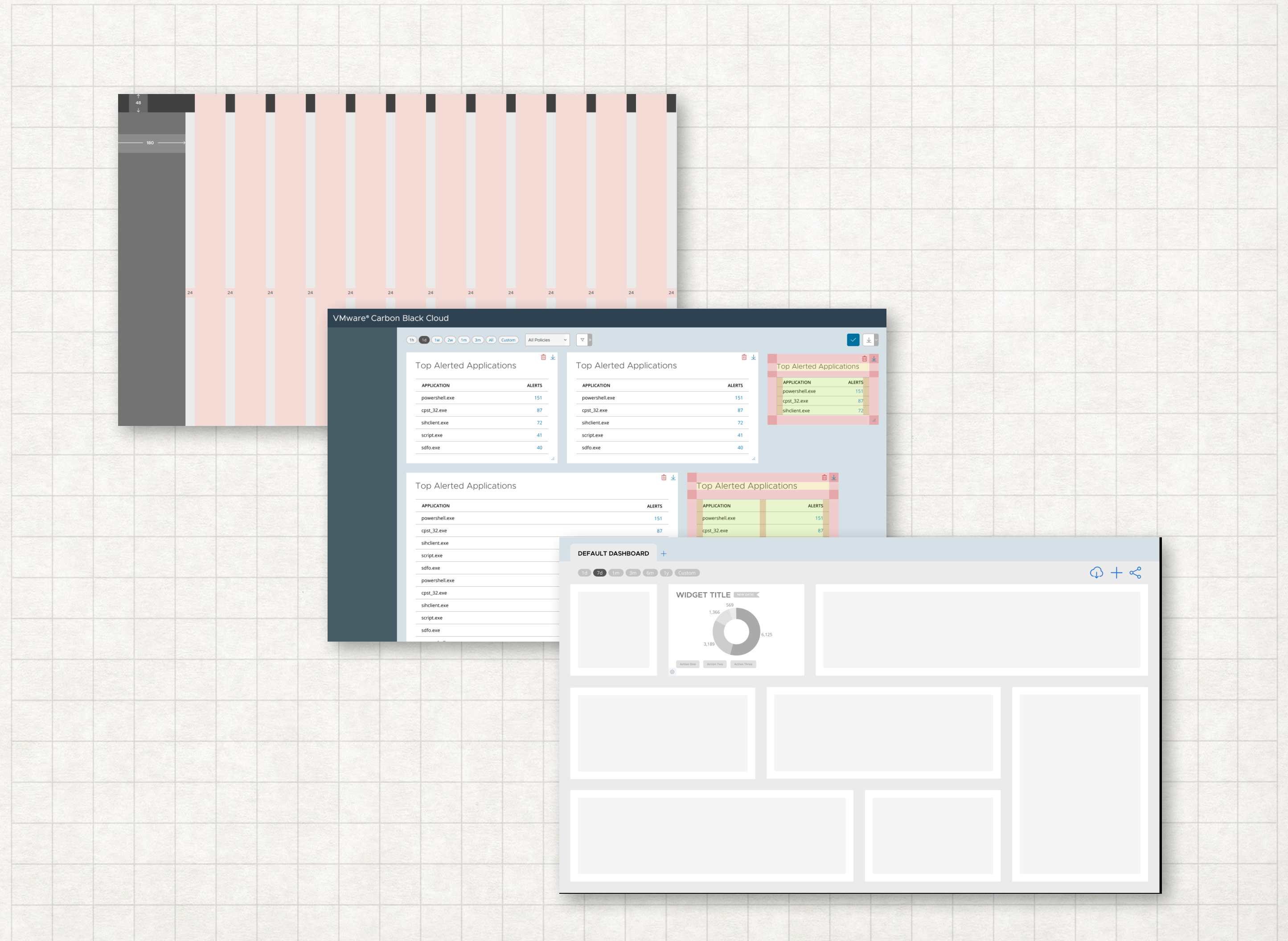


NEXT STEPS

After these benchmark results were collected and interpreted, we began design work. For this stage of the project we were tasked with improving the look and feel of the dashboard, adding new widgets, updating existing ones, adding an overall time-based filter, and conceptualizing a new framework for the dashboard.

The framework needed to account for adding, duplicating and removing widgets. filtering of individual widget data, adding, sharing and exporting of dashboards.

I created an extensive prototype showcasing the possible interactions we might want to include in the framework that would be developed. This also necessitated the introduction of a more responsive design for the page, allowing for a greater range of customization and usability with intentional breakpoints.



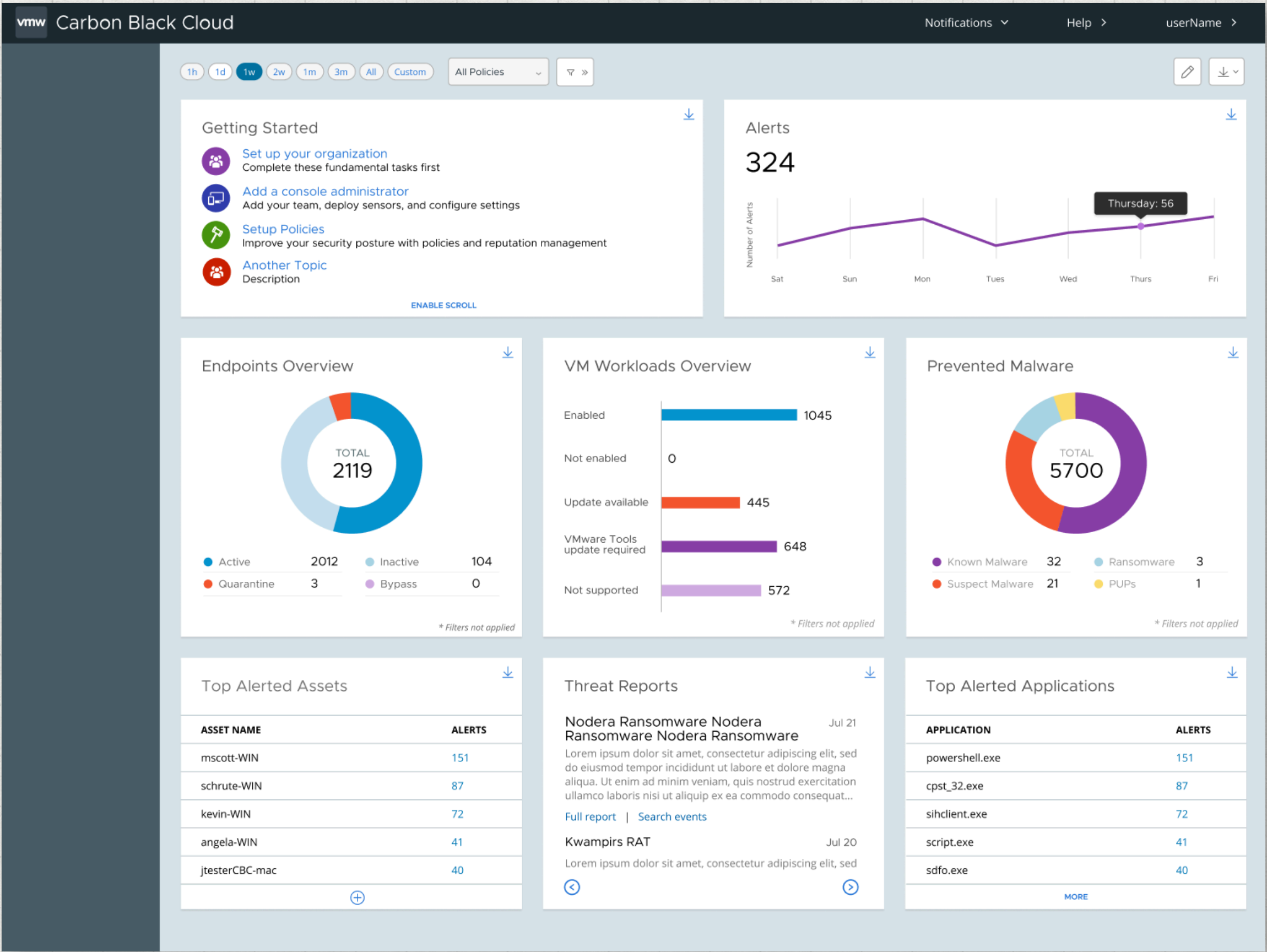
NEXT STEPS

As we worked on the dashboard framework, we also began updating old widgets and introducing new widgets into our designs.

These widgets needed to better communicate valuable information than previous iterations did. New data visualization patterns were introduced.

Derek and I worked on making these widgets attractive within the limitations imposed by the charting software we used. High charts.

At this point we were only delivering parts of the framework, a few new widgets, existing reskinned widgets, and the addition of a pdf export. Elements like widget duplication, individual widget filters, multiple dashboards, and dashboard sharing would have to wait.



IMPLEMENTATION AND FURTHER TESTING

I worked with Spencer and Parvez from engineering on the implementation of the dashboard framework and widgets.

We discussed and made changes based on accessibility concerns, the limitations of the component library, and the capabilities of the charting software.

Once initial QA was complete, we began testing with internal stakeholders. Feedback was positive, and the tests showed we were moving in the right direction.

Study Overview: Dashboard Milestone 1 Usability Testing

Research Goals

1. Assess usability of updated Dashboard design/widgets
2. Identify issues to prioritize for fixes.

Methodology

Usability testing with internal participants; 8 main tasks, some comprised of subtasks aimed to test each widget type and each piece of functionality.

Participants

- 11 internal participants with representatives from
- Sales Engineering (5)
 - Technical Product Ma
 - Managed Detection (

Configure mode was discoverable, as were most capabilities
Opportunity to increase visibility of system status and capabilities

Task 6



7 Complete - No Issues

Observations:

All participants discovered the edit mode and were able to delete and reposition widgets.

Widgets most frequently moved to the top of the dashboard:

- Alerts over time
- Endpoints
- Top Alerted Assets

Many participants did not discover resizing of widgets

State of "edit mode" not always clear to participants

- Didn't appear initially confident they were in the right location. Ex. left mode and re-entered.
- Some participants attempted to interact with widgets in this mode.

Minor issues with the apparent "grab"ability in areas of the widgets

Potential Consequences:

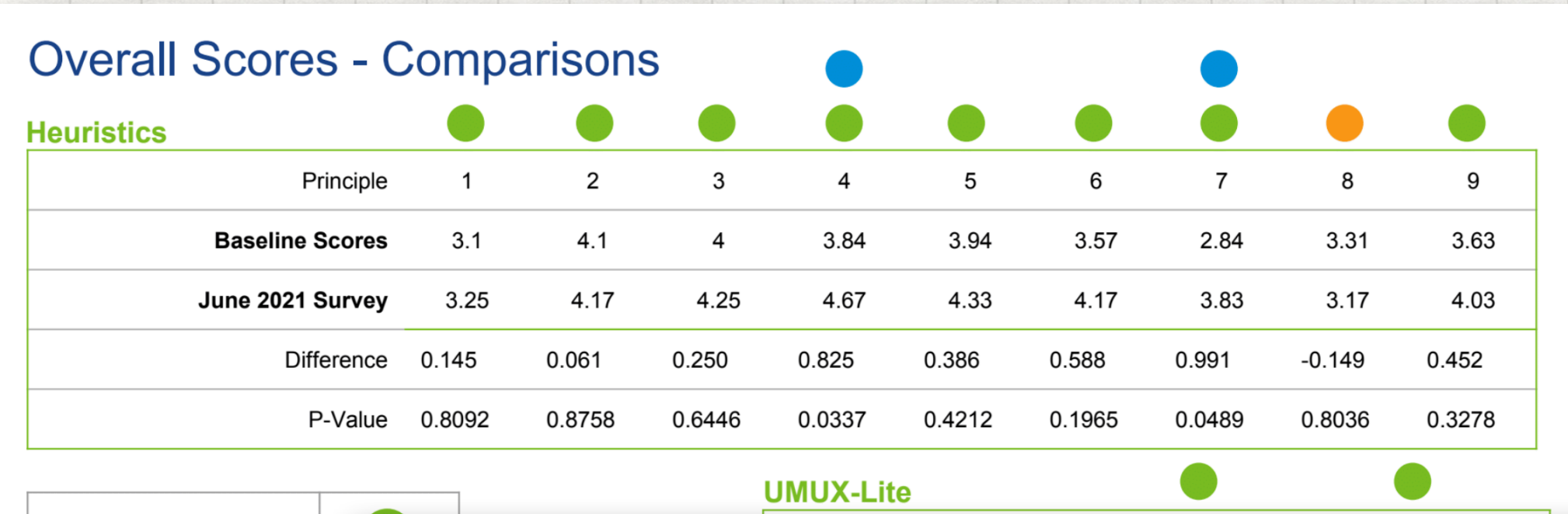
Users not may customize the dashboard to the full extent possible.

MORE TESTING AND MILESTONE 2

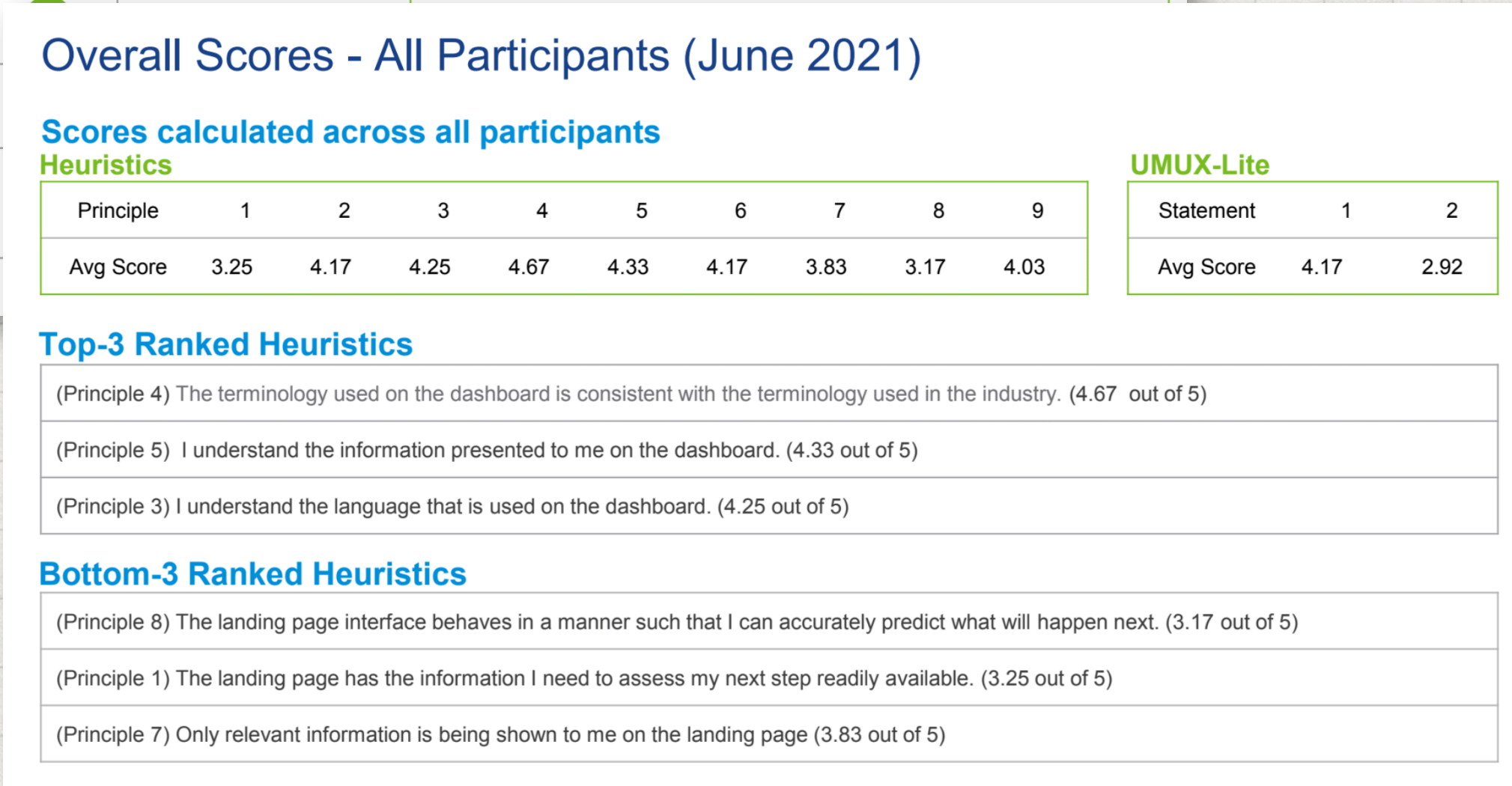
After final Quality Assurance testing the first Milestone of the project was complete. We wanted to perform the same heuristic evaluation with the new dashboard as we had with the previous version.

Results came back and there was improvement in nearly all sentiments. However, only a truly statistically significant difference was shown in a few factors. Still, these results and our internal testing showed us we were on the right track.

Next we would add the features that did not make it into Milestone 1



Positive Difference
Negative Difference
Statistically Significant Difference

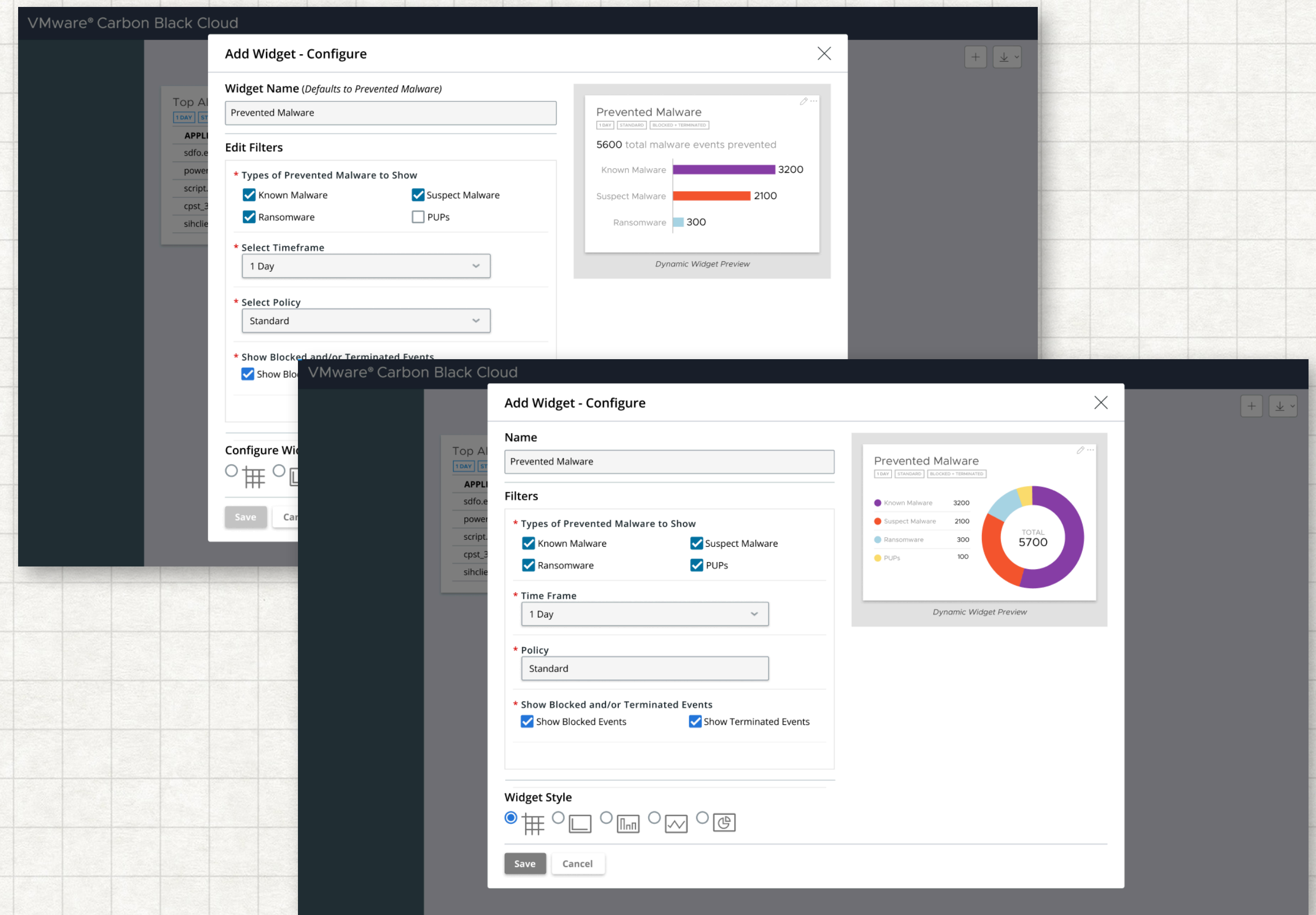


MILESTONE 2 DESIGNS

Milestone 2 was to encompass designing and developing new features for the dashboard that were not covered in Milestone 1.

We made quick progress here using the data we had previously collected to inform this phase of the design.

We added filtering for individual widgets, widget duplication, new editing and creation work flows, plus a real time widget preview.



USABILITY TESTING

Our next step, with a new design prototype in hand, was to do some task based usability testing.

We gathered information from eight participants representative of the Adam persona and of the industries we worked with. Manufacturing, financial services, education, real estate and utilities

Our testing showed that users were able to perform most tasks quickly and easily, but we also identified interactions that did not work and needed to be revised. Overall results were very positive and customers seemed as excited about the prospect of a more dynamic dashboard as we were.

All participants were able to duplicate a widget

Either through the Edit Modal or the Ellipses icon



APPLICATION	ALERTS
powershell.exe	2846
cpst_32.exe	186
sihclient.exe	143
script.exe	88
sdfo.exe	81

Initially 4 participants tried to select the pencil icon to duplicate.

They mentioned they went there because they saw the “Save as Duplicate” in the edit modal in previous tasks

After completing the Duplicate task through the ellipses icon, some participants thought the experience

I think it is better and I think it is better because that's where I first saw the three dots previously and I would go to and think that I was trying to modify this one, but I was copying it as a whole, as a copy. Participant 8

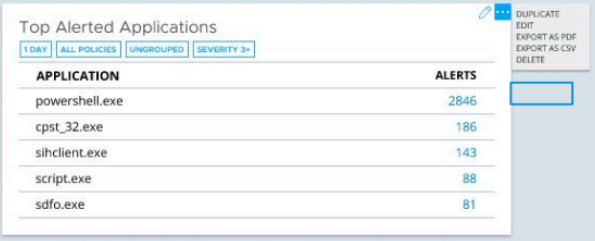
Deleting and Adding a Widget were intuitive

Both tasks were completed quickly with little to no confusion

Delete widget

6 participants' initial response was to go to the Ellipses icon

2 initially went to the Pencil icon but the Ellipses icon was a quick second option

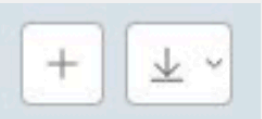


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Add a new widget

All participants were able to easily add a widget

The button was easily discovered and understood, all participants went to the “+” icon (located in top right corner of Dashboard) right away



GOOD RESULTS

“**OH INTERESTING. I LIKE THAT ACTUALLY** [WIDGET PREVIEW] BECAUSE SAY I MESSED UP MORE, MESSED UP SOMETHING, OR PUT IN SOMETHING THAT I DID NOT INTEND TO, **IT MAY NOT BE CLEAR TO ME** THAT I MODIFIED IT AND IT'S DISPLAYING DATA THE INCORRECT WAY”

— Participant 8

“**ECSTATIC THAT YOU GUYS ARE TAKING INPUT AND EVERYTHING.** I DIDN'T SEE ANYTHING THAT WAS DIFFICULT OR TOO CHALLENGING. KIND OF LIKE I SAID, IF ANYONE HAD ANY TYPE OF EXPERIENCE WITH THE CARBON BLACK DASHBOARD I THINK ANY OF THE CHANGES THAT YOU SHOWED ME OR ANY OF THE THINGS THAT YOU GUYS ARE PLANNING TO IMPLEMENT WOULD BE **PRETTY EASY FOR THE AVERAGE, I'M NOT EVEN TALKING ABOUT THE ADVANCED, CARBON BLACK CLOUD USER TO BE ABLE TO FIGURE OUT AND NAVIGATE**”

— Participant 4

“A NUMBER OF TIMES WHEN I'M WORKING WITH CARBON BLACK PRODUCTS LIKE IT AND I'M TRYING TO CUSTOMIZE A DASHBOARD WIDGET, **IT'S MUCH EASIER TO DUPLICATE AN EXISTING WIDGET** AND JUST CHANGE SOME OF THE SETTINGS RATHER THAN CREATING A BRAND NEW ONE FROM SCRATCH”

— Participant 2

BAD NEWS

The dashboard team was very excited by the latest round of usability testing results. We would be adding a lot of value to our customers by making this round of Milestone changes. We had been making really good progress on the initiative even as we worked on others.

The Milestone 1 launch had been well received and we anticipated an even more positive reception and better results for Milestone 2. We would be giving our users much greater control and flexibility over their dashboard and the widget components.

However, despite our positive results we were told that the project had been descoped and deprioritized. Why? Other more immediate projects with a greater direct effect on the bottom line needed focused attention. We had also met many of our goals, if not the more ambitious goals of widget customization and multiple dashboards.

DASHBOARD INITIATIVE OUTCOMES

- Customers expressed having a better view of information they needed and a greater variety of data to take action against. This was a result of better data visualizations with some level of interactivity using High Charts
- Increased usage, 50% increase in clickthroughs using dashboard widgets
- Successful deployment of a new filter pattern that affected the overall timeframe of all individual widget displays
- Improved export and added a new .pdf reporting option for creating executive summaries
- Sales engineers self-reported that they no longer skipped using the dashboard as a jumping off point during sales calls
- We were unable to add filtering and customization to individual widgets. Duplication, sharing, and a greater view of trends for some widgets had to be left on the table, as well, as priorities changed
- I worked with multiple researchers and research methodologies for this project, expanding on my knowledge of UX research practices
- I learned that even promising projects may need to be shelved for another day, and sometimes we have to be willing to let go of a project we are passionate about. I was happy with what we had accomplished, but I would have liked to finish the entire vision and bring greater value to customers. Still, we had achieved much of what we had set out to do.

THANK YOU!

“ECSTATIC THAT YOU GUYS ARE TAKING INPUT AND EVERYTHING. I DIDN’T SEE ANYTHING THAT WAS DIFFICULT OR TOO CHALLENGING. KIND OF LIKE I SAID, IF ANYONE HAD ANY TYPE OF EXPERIENCE WITH THE CARBON BLACK DASHBOARD I THINK ANY OF THE CHANGES THAT YOU SHOWED ME OR ANY OF THE THINGS THAT YOU GUYS ARE PLANNING TO IMPLEMENT WOULD BE **PRETTY EASY FOR THE AVERAGE, I’M NOT EVEN TALKING ABOUT THE ADVANCED, CARBON BLACK CLOUD USER TO BE ABLE TO FIGURE OUT AND NAVIGATE”**

— *Participant 4*

Mark P. Madden

talorien@yahoo.com

508.277.8561

Portfolio - www.markpmadden.com

LinkedIn - www.linkedin.com/in/mark-madden-287108

More about CarbonBlack - www.carbonblack.com