U.PORTO

Software Development in Practice

Software Engineering 2018

Bruno Carvalho
up201606517

Diogo Yaguas
up201606165

Tiago Castro
up201606186

December 23, 2018

Contents

1 Issue 2554

When trying to change the zoom value by clicking the zoom button, the zoom label on the right lower corner updates correctly, but when trying to zoom in using the key shortcut (CTRL + '+'/'-') or via the view menu, the zoom label doesn't update.

1.1 Steps

1. Launch Boostnote
2. Click on the zoom button on the right lower corner
3. Change the zoom level
4. Verify that zoom label was successfully altered
5. Change the zoom level using the key shortcut (CTRL + '+'/'-') or the view menu
6. Verify that zoom label was unsuccessfully altered

Result: The key shortcut doesn't work

1.2 Requirements

The key shortcuts for *zoom in*, *zoom out* should modify the zoom label on the right lower corner, however, the key shortcuts just zoom in and zoom out, and don't alter it.
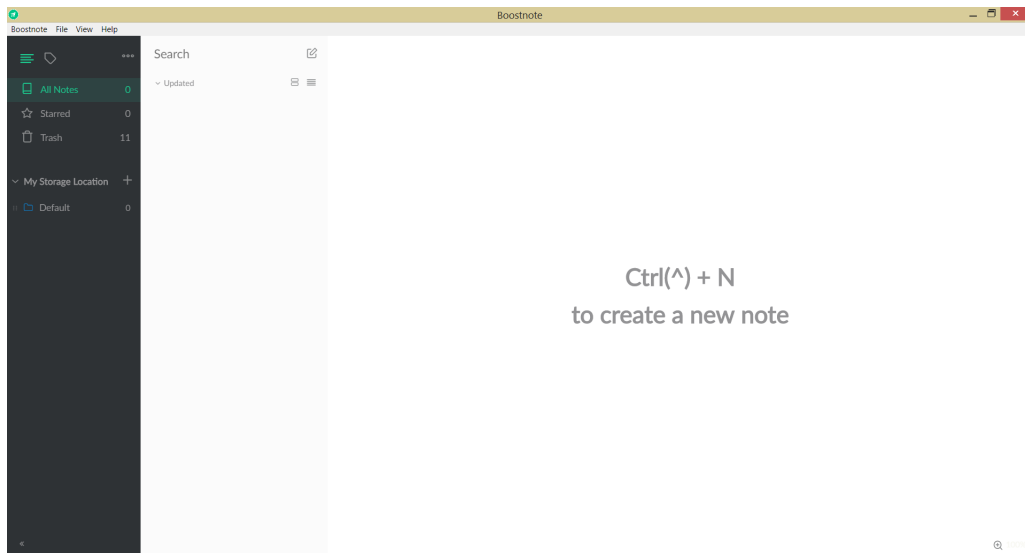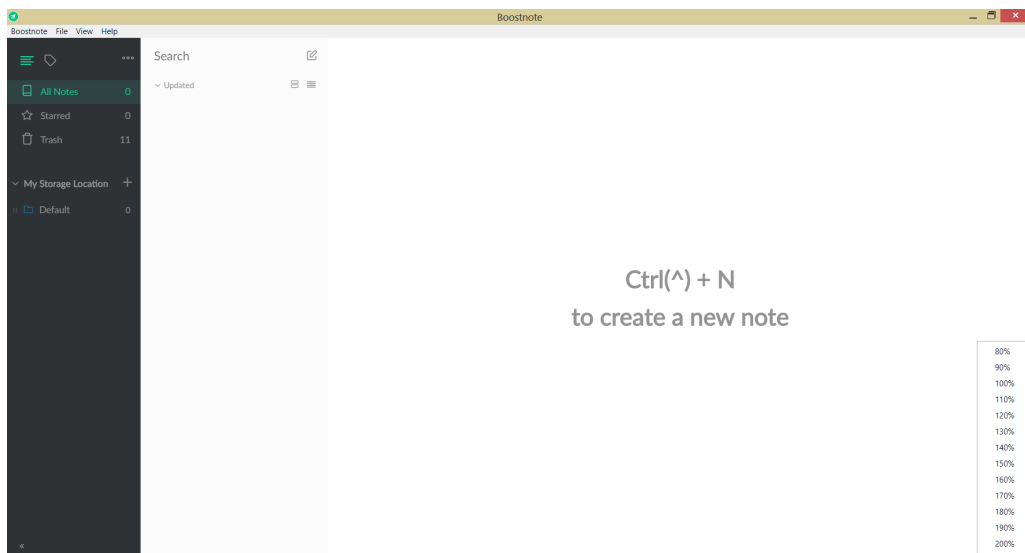

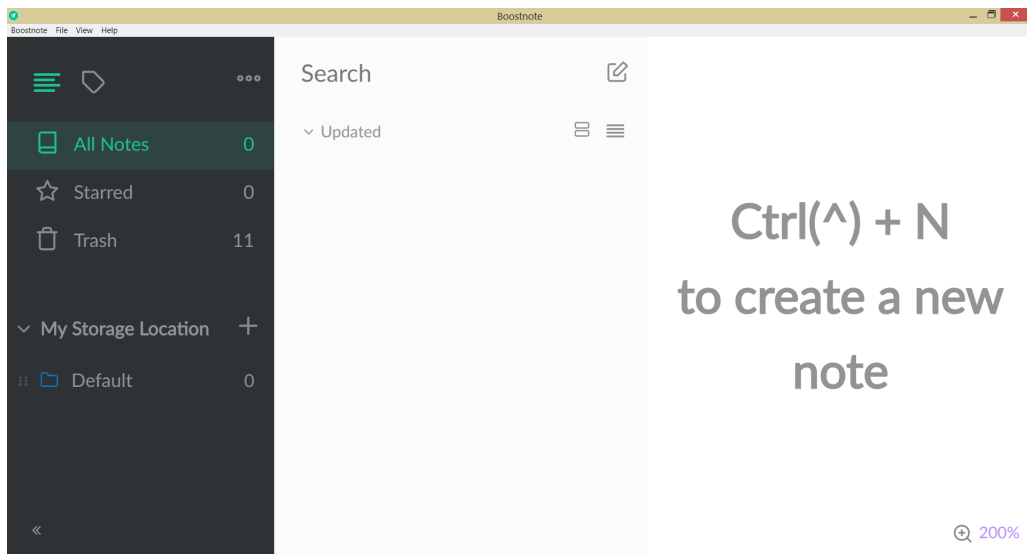Figure 1: Normal Zoom

Figure 2: Zoom Menu
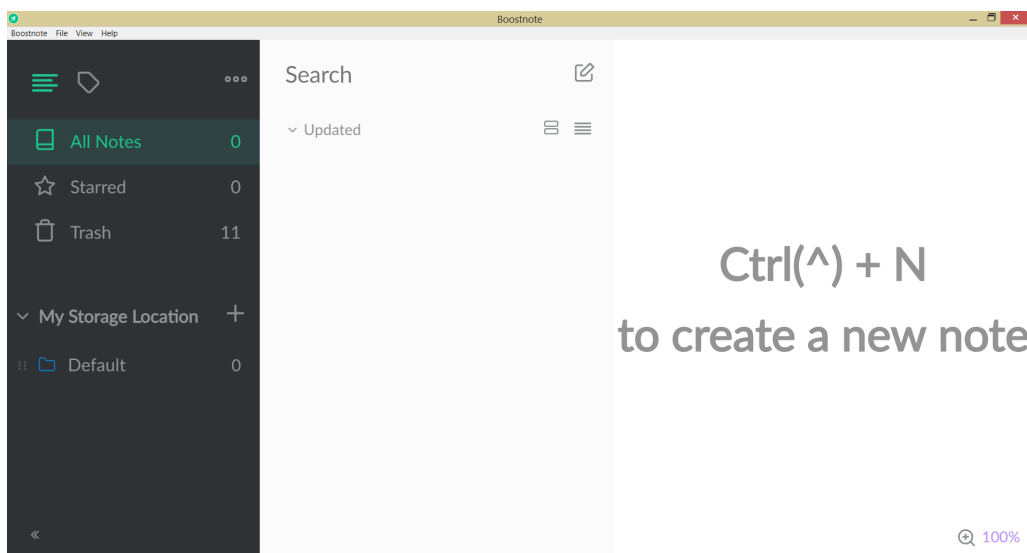
Figure 3: Zoom level at 200% and label update

Figure 4: Zoom level increased with key shortcut and label not updated

In **main-menu.js**, the Menu template (Electron) is created and there, the 'Zoom In' and 'Zoom Out' options are added to the view menu.

The menu itens are roles (labels with pre-made listeners) for the zoom in and zoom out buttons as electron has specific listeners for these actions:

- **zoomIn** - Zoom in the focused page by 10%.

- **zoomOut** - Zoom out the focused page by 10%.

CTRL+ is associated to Zoom In and CTRL- is to Zoom Out by association as triggers to modify the zoom.

The problem is that, when you zoom in or out using the views menu, the browser window zoomfactor is altered, but the config isn't altered, only the browser window class. The browser window class is where the zoom is actually set and the config is where the zoom value is kept for easy access.

When the zoom is changed via the status bar zoom (on the right bottom corner), not only is the browser window zoomFactor value changed, but also the config zoom value from which the current zoom label gets its value. The function used to do this is the **handleZoomMenuItemClick** function in **StatusBar/index.js** which uses the **setZoom** and inheretly the **saveZoom** function from **ZoomManager.js**.

The label is defined in the render function of the StatusBar on StatusBar/index.js and as we can see, it get se zoom value from the config.

1.3 Source Code Files

```
312        {
313          role: 'zoomin',
314          accelerator: macOS ? 'CommandOrControl+Plus' : 'Control+='
315        },
316        {
317          role: 'zoomout'
318        }
```

Figure 5: main-menu.js

```
handleZoomMenuItemClick (zoomFactor) {
  const { dispatch } = this.props
  ZoomManager.setZoom(zoomFactor)
  dispatch({
    type: 'SET_ZOOM',
    zoom: zoomFactor
  })
}
```

```
render () {
  const { config, status } = this.context

  return (
    <div className='StatusBar'
      styleName='root'
    >
      <button styleName='zoom'
        onClick={(e) => this.handleZoomButtonClick(e)}
      >
        <img src='../resources/icon/icon-zoom.svg' />
        <span>{Math.floor(config.zoom * 100)}%</span>
      </button>

      {status.updateReady
        ? <button onClick={this.updateApp} styleName='update'>
          <i styleName='update-icon' className='fa fa-cloud-download' /> {i18n.__('Ready to Update!')}
        </button>
        : null
      }
    </div>
  )
}
```

Figure 6: StatusBar/index.js

```javascript
function _saveZoom (zoomFactor) {
  ConfigManager.set({zoom: zoomFactor})
}

function setZoom (zoomFactor, noSave = false) {
  if (!noSave) _saveZoom(zoomFactor)
  remote.getCurrentWebContents().setZoomFactor(zoomFactor)
}
```

Figure 7: ZoomManager.js

```javascript
export const DEFAULT_CONFIG = {
  zoom: 1,
  isSideNavFolded: false,
  listWidth: 280,
  navWidth: 200,
  sortBy: {
    default: 'UPDATED_AT' // 'CREATED_AT', 'UPDATED_AT', 'APLHABETICAL'
  },
  sortTagsBy: 'ALPHABETICAL', // 'ALPHABETICAL', 'COUNTER'
  listStyle: 'DEFAULT', // 'DEFAULT', 'SMALL'
  amaEnabled: true,
  hotkey: {
    toggleMain: OSX ? 'Command + Alt + L' : 'Super + Alt + E',
    toggleMode: OSX ? 'Command + Alt + M' : 'Ctrl + M',
    deleteNote: OSX ? 'Command + Shift + Backspace' : 'Ctrl + Shift + Backspace'
  },
  ui: {
    language: 'en',
    theme: 'default',
    showCopyNotification: true,
    disableDirectWrite: false,
    defaultNote: 'ALWAYS_ASK' // 'ALWAYS_ASK', 'SNIPPET_NOTE', 'MARKDOWN_NOTE'
  },
  editor: {
    theme: 'base16-light',
    keyMap: 'sublime',
    fontSize: '14',
    fontFamily: win ? 'Segoe UI' : 'Monaco, Consolas'
```

Figure 8: ConfigManager.js

```javascript
const mainWindow = new BrowserWindow({
  x: windowSize.x,
  y: windowSize.y,
  width: windowSize.width,
  height: windowSize.height,
  useContentSize: true,
  minWidth: 500,
  minHeight: 320,
  autoHideMenuBar: showMenu,
  webPreferences: {
    zoomFactor: 1.0,
    enableBlinkFeatures: 'OverlayScrollbars'
  },
  icon: path.resolve(__dirname, '../resources/app.png')
})
```

Figure 9: main-window.js

1.4 System Architecture

To better understand the system and how the modules interact, a diagram was created in which the different dependencies in boostnote can be observed. This type of diagram was picked because it gives an overview of the system without going into too much detail as the project is far too big. The most important dependency to this issue is the electron dependency as it is the framework used for the application.
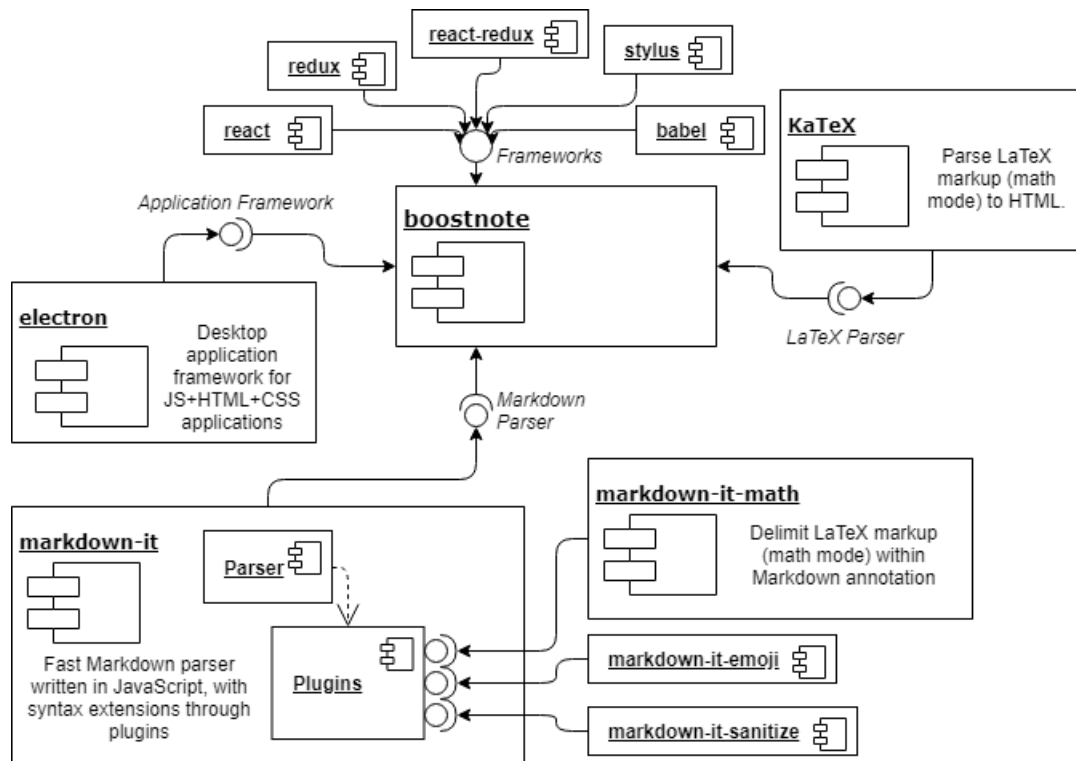

Figure 10: Boostnote's main dependencies

1.5 Design of the fix

The way to fix this issue is by either, getting the zoomFactor from the browser window instead of from the config or changing the menu item in the menu to not using the zoomin and zoomout role action, using instead another listener that also calls the config update.

In the following sequence diagram, it is explained how the zoomin/zoomout menu option click (which can be done with the hotkeys as well) will be handled. Boostnote will send a message to electron which will have a callback associated to it and will call the said function to handle it. The handler function will call handleZoomMenuItemClick function which is used by the zoom button to change the menu, it updates the zoom value on the config and on the browser window.
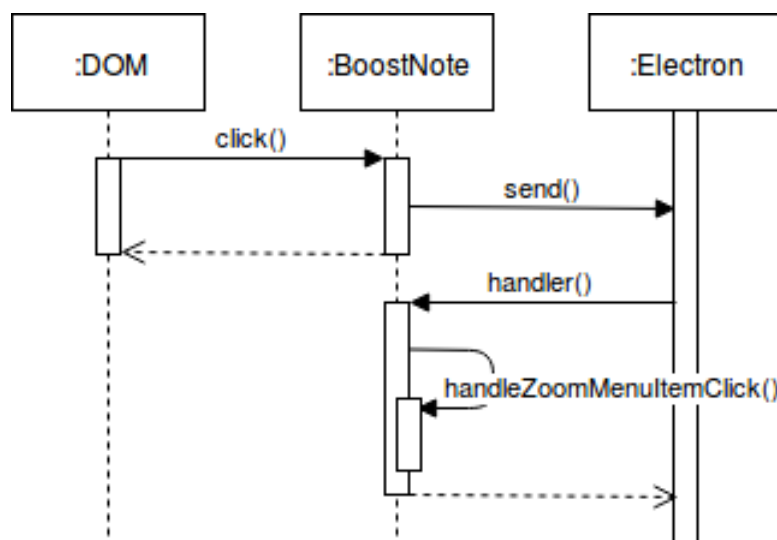

Figure 11: UML diagrams that illustrate the plan to fix the issue

1.6   Fix Source Code

```
312     {
313       role: 'zoomin',
314       accelerator: macOS ? 'CommandOrControl+Plus' : 'Control+='
315     },
316     {
317       role: 'zoomout'
318     }
```

Figure 12: main-menu.js

In this file, the menu itens for zoom out and zoom in were changed from roles to labels in order for a custom listener to be associated with click(), disabling the built in listener associated to the role zoomin and zoomout. An accelerator was associated with each of the itens, CommandOrControl, meaning the hotkey will work on mac as well, CommandOrControl+= meaning Ctrl+(or Cmd+) and CommandOrControl+- meaning Ctrl-(or Cmd-).

On the listeners, an electron request is sent which will be redirected to the respective handler.

```
componentDidMount () {
  this.handleZoomInBound = this.handleZoomIn.bind(this)
  this.handleZoomOutBound = this.handleZoomOut.bind(this)
  eventEmitter.on('statusbar:zoomin', this.handleZoomInBound)
  eventEmitter.on('statusbar:zoomout', this.handleZoomOutBound)
}

componentWillUnmount () {
  eventEmitter.off('statusbar:zoomin', this.handleZoomInBound)
  eventEmitter.off('statusbar:zoomout', this.handleZoomOutBound)
}
```

Figure 13: StatusBar/index.js

In this snippet, the React.js function componentDidMount is used to bind the handlers to the StatusBar component as soon at it is mounted (added to the tree) and the eventEmitter.js functions are used to associate the requests to the respective bound handlers. By binding the handlers to the component, they are able to call class functions using the 'this' keyword.

The function componentWillUnmount is also used to dissociate the requests from the respective handlers just before the component is unmounted and destroyed.

```
handleZoomIn () {
  this.handleZoomMenuItemClick(ZoomManager.getZoom() + 0.1)
}

handleZoomOut () {
  this.handleZoomMenuItemClick(ZoomManager.getZoom() - 0.1)
}
```
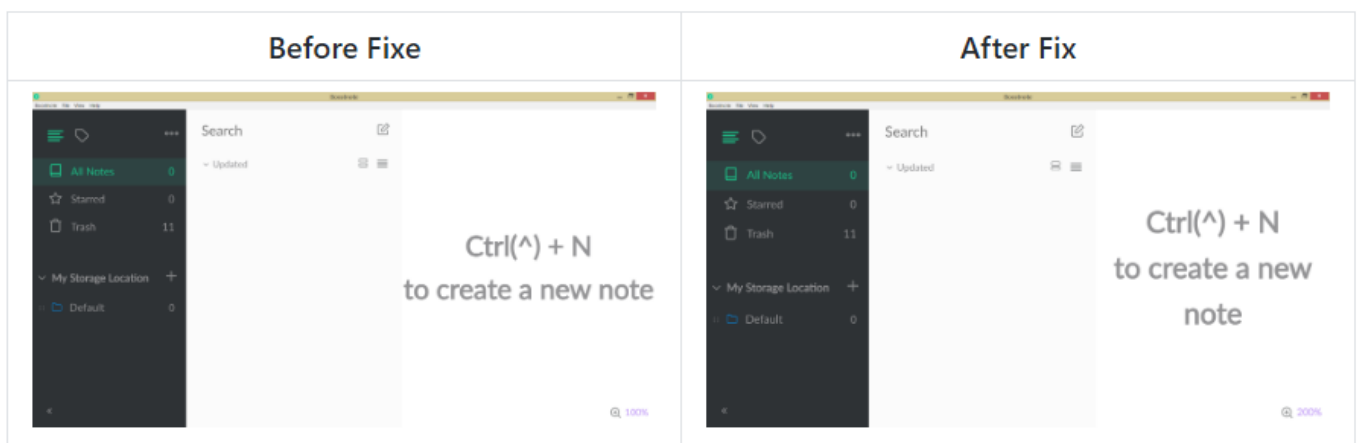
Figure 14: Handle Zoom

In this snippet, the handler functions are defined calling the already implemented function handleZoomMenuItemClick that changes the zoom value on the config and also on the browser window, receiving as parameter the new zoom which is the current zoom incremented or decremented by 0,1.

1.7 Validate the fix

Both images have a zoom value of 200%, changed by the key shortcut. Only after the fix, the value of the label in the lower right corner was changed.

☑ Peer review
☑ Easy to read and understand
☑ Efficient
☑ Lint Verified
☑ Passed all tests

1.8 Submission of the fix

Pull Request

1. The Pull Request has been submitted and approved;

2. The issue was indeed solved by a third party before us;

3. The issue is the same as in the first delivery;

4. Although the pull request was denied, we believe our solution to the issue is a bit more efficient and clean than the one previously accepted.

2 Issue 2557

When typing display math LaTeX in a markdown note, the written LaTeX is parsed correctly but displayed incorrectly, with certain constructs having line breaks between tokens.

2.1 Steps

1. Launch Boostnote

2. Open a new Markdown Note. Press *Ctrl N* or click on the icon next to the search bar; then select Markdown Note.

3. Toggle mode to two panels in the top right corner (should be the default). Now you should have two panels open, the edit and view panels.

4. Reproduce the error. Type the following in the edit panel:

```
$$
\begin{aligned}
    &P(X=x)=\binom{n}{k}P^x(1-p)^{(n-x)}\\
    &Var(X)=np(1-p)
\end{aligned}
$$
```

2.2 Requirements

As of release v0.11.9 of Sep 9, and upstream master branch as of Nov 14, we get this result:

$$P(X = x) = \binom{n}{k} P^x (1 - p)$$
$$(n-x)$$

$$Var(X) = np(1 - p)$$

However, the expected result is naturally:

$$P(X = x) = \binom{n}{k} P^x (1 - p)^{(n-x)}$$
$$Var(X) = np(1 - p)$$

The problem is that there is a line break where there should not be one: line breaks in display math mode are not allowed outside environments, and inside environment aligned line breaks are inserted with '\\', enumerating equations.

2.3   Source Code Files

The bug is the file:

- browser/components/markdown.styl

```
body
  font-size 16px
  padding 15px
  font-family helvetica, arial, sans-serif
  line-height 1.6
  overflow-x hidden
  background-color $ui-noteDetail-backgroundColor
  .flowchart-error, .sequence-error .chart-error
    background-color errorBackgroundColor
    color errorTextColor
    padding 5px
    border-radius 5px
    justify-content left
  .katex
    font 400 1.2em 'KaTeX_Main'
    line-height 1.2em
    white-space initial
    text-indent 0
  .katex .mfrac>.vlist>span:nth-child(2)
    top 0 !important
  .katex-error
    background-color errorBackgroundColor
    color errorTextColor
    padding 5px
    margin -5px
    border-radius 5px
li
  label.taskListItem
    margin-left -1.8em
    &.checked
      text-decoration line-through
      opacity 0.5
  &.taskListItem.checked
    text-decoration line-through
    opacity 0.5
div.math-rendered
  text-align center
.math-failed
  background-color alpha(red, 0.1)
  color darken(red, 15%)
  padding 5px
  margin 5px 0
  border-radius 5px
```

2.4   Source of the problem

The problem is not in the dependency (**KaTeX**). The **KaTeX** dependency includes its own major stylesheet, which should enforce this restriction on its own display math elements. So the problem should be in some of Boostnote's own style sheets, conflicting somehow with those of **KaTeX**.
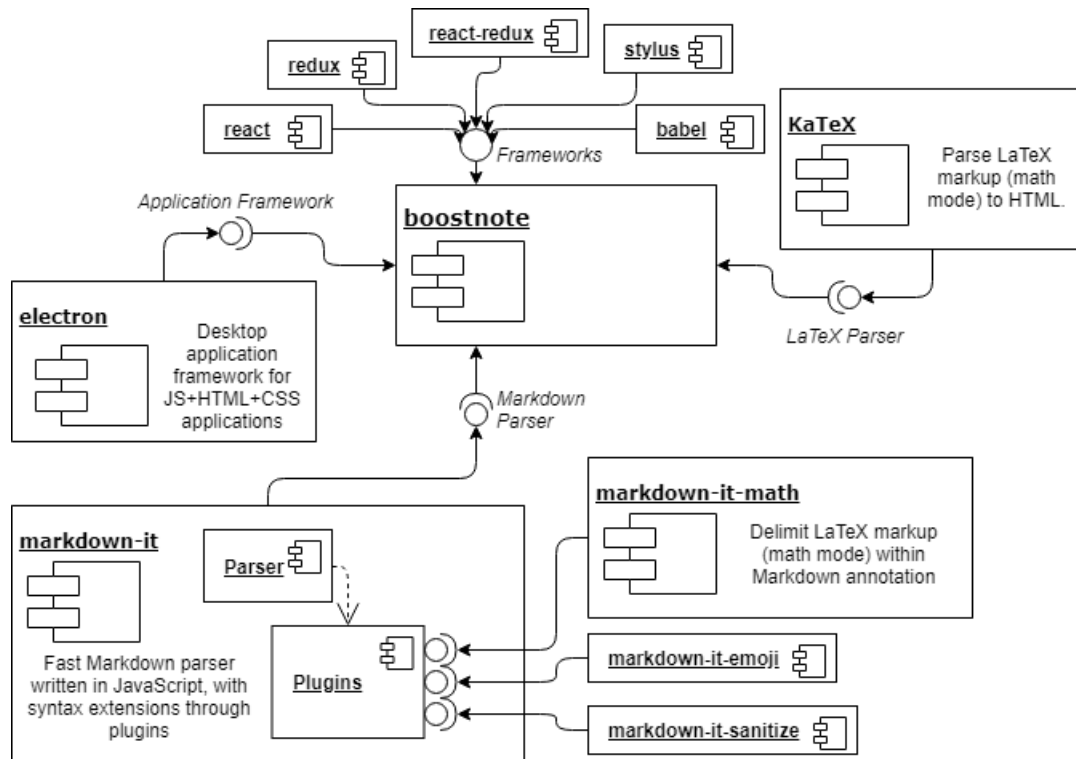
Inspecting the elements inside Boostnote (*Ctrl Shift I*) suggests looking at class names *.katex* and *.katex-display*, as the rendered LaTeX parent element has these class names. A quick

```
grep -rnE "\\.katex" browser/
```

immediately pinpoints file markdown.styl.

2.5   System Architecture

A simple rundown of Boostnote's main dependencies, with emphasis on markdown-it and katex:

2.6   Design of the fix

Discussion

KaTeX, being a LaTeX formatting engine for the web, would certainly not have made it this far while allowing line breaks inside display math environments generally. We verified this earlier. So Boostnote's own stylesheets must be messing around where they shouldn't, and overwriting KaTeX's imported stylesheets.

There are a few ways to fix this issue, but a proper fix will ultimately be a **breaking change** as it will disallow line wrapping in display math environments — much to the dislike of some users, probably.

Changing this attribute to nowrap will have unintended side effects (no wrapping in inline math mode), so the problem, albeit simple, will require further testing. The most likely solution will involve demoting selector body .katex to .katex-inline or removing the attribute, or even removing the .katex rules altogether.

Source of the problem

The problem is not in the dependency (KaTeX), see this discussion. The KaTeX dependency includes its own major stylesheet, which should enforce this restriction on its own display math elements.

Inspecting the elements inside Boostnote (Ctrl Shift I) suggests looking at class names .katex and .katex-display, as the rendered LaTeX parent element has these class names. A quick

```
grep −rnE "\\.katex" browser/
```

on the repository's main directory immediately pinpoints file **browser/components/markdown.styl**.

At katex.org we compare the computed styles of the LaTeX shown on the front page to those of Boostnote applied to the same LaTeX elements. In particular we looked at attributes like display, textalign, and overflow-wrap. We concluded quickly that the problem was in the attribute *white-space*, whose value was reset to **initial** in Boostnote (in this case normal) for everything math element, instead of *nowrap* which is KaTeX's own style.

2.7 Fix source code

The fix is essentially removing style *whitespace nowrap" from *markdown.styl* while causing the smallest possible breaking change. After due analysis and experimentation on a variety of LaTeX constructs we decided to remove the entire rule *.katex* and replace it with a simple switch: *whitespace nowrap* for KaTeX display elements and *whitespace initial* otherwise.

2.8 Validate the fix

Solution Images

Consider the following content of a Markdown Note, containing mostly LaTeX and little Markdown:

```
 1  ##### Display environment, good LaTeX:
 2
 3  $$\begin{aligned}
 4  &P(X=x)=\binom{n}{k}P^x(1-p)^{(n-x)}\\
 5  &Var(X)=np(1-p)
 6  \end{aligned}$$
 7
 8  ##### Inline, good LaTeX:
 9
10  $\{a,b\}$, lorem ipsum dolor sit amet, $\{a,b,c,d\}$, $\{a,b,c\},\{x,y,z,w\},\{x,y,z,w,a,b,c,d\},\
    {x,y,w,z,1,2,3,4,a,b,c,d\}$ lorem ipsum.
11
12  $\{a,b,c\},\{x,y,z,w\},\{x,y,z,w,a,b,c,d\},\{x,y,w,z,1,2,3,4,a,b,c,d\}$
13
14  Lorem ipsum dolor sit amet, $P(X=x)=\binom{n}{k}P^x(1-p)^{(n-x)}$
15
16  ##### Inline environment, bad LaTeX:
17
18  $\begin{aligned}
19  \{a,b,c\},\{x,y,z,w\},\{x,y,z,w,a,b,c,d\},\{x,y,w,z,1,2,3,4,a,b,c,d\}%&
20  \end{aligned}$
21
22  $\begin{aligned}
23  &\{a,b,c\},\{x,y,z,w\},\{x,y,z,w,a,b,c,d\},\{x,y,w,z,1,2,3,4,a,b,c,d\}
24  \end{aligned}$
25
26  ##### Inline environment, bad LaTeX:
27
28  $\begin{aligned}
29  &P(X=x)=\binom{n}{k}P^x(1-p)^{(n-x)}\\
30  &Var(X)=np(1-p)
31  \end{aligned}$
```

Now, below on the left is Boostnote's representation of the above LaTeX, and on the right that same LaTeX after the fix.

Display environment, good LaTeX:
$$P(X = x) = \binom{n}{k} P^x (1 - p)^{(n-x)}$$

$$Var(X) = np(1 - p)$$

Inline, good LaTeX:

$\{a, b\}$, lorem ipsum dolor sit amet, $\{a, b, c, d\}$, $\{a, b, c\}, \{x, y, z, w\}, \{x, y, z, w, a, b, c, d\}, \{x, y, w, z, 1, 2, 3, 4, a, b, c, d\}$ lorem ipsum.

$\{a, b, c\}, \{x, y, z, w\}, \{x, y, z, w, a, b, c, d\}, \{x, y, w, z, 1, 2, 3, 4, a, b, c, d\}$

Lorem ipsum dolor sit amet, $P(X = x) = \binom{n}{k} P^x (1 - p)^{(n-x)}$

Inline environment, bad LaTeX:
$\{a, b, c\}, \{x, y, z, w\}, \{x, y, z, w, a, b, c, d\}, \{x, y, w, z, 1, 2, 3, 4, a, b, c, d\}$
$\{a, b, c\}, \{x, y, z, w\}, \{x, y, z, w, a, b, c, d\}, \{x, y, w, z, 1, 2, 3, 4, a, b, c, d\}$

Inline environment, bad LaTeX:
$P(X = x) = \binom{n}{k} P^x (1 - p)^{(n-x)}$

$Var(X) = np(1 - p)$

Display environment, good LaTeX:

$$P(X = x) = \binom{n}{k} P^x (1 - p)^{(n-x)}$$
$$Var(X) = np(1 - p)$$

Inline, good LaTeX:

$\{a, b\}$, lorem ipsum dolor sit amet, $\{a, b, c, d\}$, $\{a, b, c\}, \{x, y, z, w\}, \{x, y, z, w, a, b, c, d\}, \{x, y, w, z, 1, 2, 3, 4, a, b, c, d\}$ lorem ipsum.

$\{a, b, c\}, \{x, y, z, w\}, \{x, y, z, w, a, b, c, d\}, \{x, y, w, z, 1, 2, 3, 4, a, b, c, d\}$

Lorem ipsum dolor sit amet, $P(X = x) = \binom{n}{k} P^x (1 - p)^{(n-x)}$

Inline environment, bad LaTeX:
$\{a, b, c\}, \{x, y, z, w\}, \{x, y, z, w, a, b, c, d\}, \{x, y, w, z, 1, 2, 3, 4, a, b, c, d\}$
$\{a, b, c\}, \{x, y, z, w\}, \{x, y, z, w, a, b, c, d\}, \{x, y, w, z, 1, 2, 3, 4, a, b, c, d\}$

Inline environment, bad LaTeX:
$P(X = x) = \binom{n}{k} P^x (1 - p)^{(n-x)}$

$Var(X) = np(1 - p)$

Display environment, good LaTeX:
$$P(X = x) = \binom{n}{k} P^x (1 - p)^{(n-x)}$$

$$Var(X) = np(1 - p)$$

Inline, good LaTeX:

$\{a, b\}$, lorem ipsum dolor sit amet, $\{a, b, c, d\}$, $\{a, b, c\}, \{x, y, z, w\}, \{x, y, z, w, a, b, c, d\}, \{x, y, w, z, 1, 2, 3, 4, a, b, c, d\}$ lorem ipsum.

$\{a, b, c\}, \{x, y, z, w\}, \{x, y, z, w, a, b, c, d\}, \{x, y, w, z, 1, 2, 3, 4, a, b, c, d\}$

Lorem ipsum dolor sit amet,
$P(X = x) = \binom{n}{k} P^x (1 - p)^{(n-x)}$

Inline environment, bad LaTeX:
$\{a, b, c\}, \{x, y, z, w\}, \{x, y, z, w, a, b, c, d\}, \{x, y, w, z, 1, 2, 3, 4, a, b, c, d\}$
$\{a, b, c\}, \{x, y, z, w\}, \{x, y, z, w, a, b, c, d\}, \{x, y, w, z, 1, 2, 3, 4, a, b, c, d\}$

Inline environment, bad LaTeX:
$P(X = x) = \binom{n}{k} P^x (1 - p)^{(n-x)}$

$Var(X) = np(1 - p)$

Display environment, good LaTeX:

$$P(X = x) = \binom{n}{k} P^x (1 - p)^{(n-x)}$$
$$Var(X) = np(1 - p)$$

Inline, good LaTeX:

$\{a, b\}$, lorem ipsum dolor sit amet, $\{a, b, c, d\}$, $\{a, b, c\}, \{x, y, z, w\}, \{x, y, z, w, a, b, c, d\}, \{x, y, w, z, 1, 2, 3, 4, a, b, c, d\}$ lorem ipsum.

$\{a, b, c\}, \{x, y, z, w\}, \{x, y, z, w, a, b, c, d\}, \{x, y, w, z, 1, 2, 3, 4, a, b, c, d\}$

Lorem ipsum dolor sit amet,
$P(X = x) = \binom{n}{k} P^x (1 - p)^{(n-x)}$

Inline environment, bad LaTeX:
$\{a, b, c\}, \{x, y, z, w\}, \{x, y, z, w, a, b, c, d\}, \{x, y, w, z, 1, 2, 3, 4, a, b, c, d\}$
$\{a, b, c\}, \{x, y, z, w\}, \{x, y, z, w, a, b, c, d\}, \{x, y, w, z, 1, 2, 3, 4, a, b, c, d\}$

Inline environment, bad LaTeX:
$P(X = x) = \binom{n}{k} P^x (1 - p)^{(n-x)}$

$Var(X) = np(1 - p)$

Notice how, on the narrow display panel, the display math overflows the x-axis and is hidden. This is the expected behaviour in any LaTeX document.

2.9   Submission of the fix

The pull request was accepted on 16 December.

The issue was not changed from Delivery 1, nor any extra/adjacent issues were created or fixed along with this one.

3   Wrap Up

Diogo Yaguas - Searching issues and report
Bruno Carvalho - Issue #2557
Tiago Castro - Issue #2554

The work distribution was equally distributed.