

MICHIGAN STATE  

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UNIVERSITY

# Alpha Presentation

## Splitting the Atom. Again.

The Capstone Experience

Team Mozilla

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*From Students...  
...to Professionals*

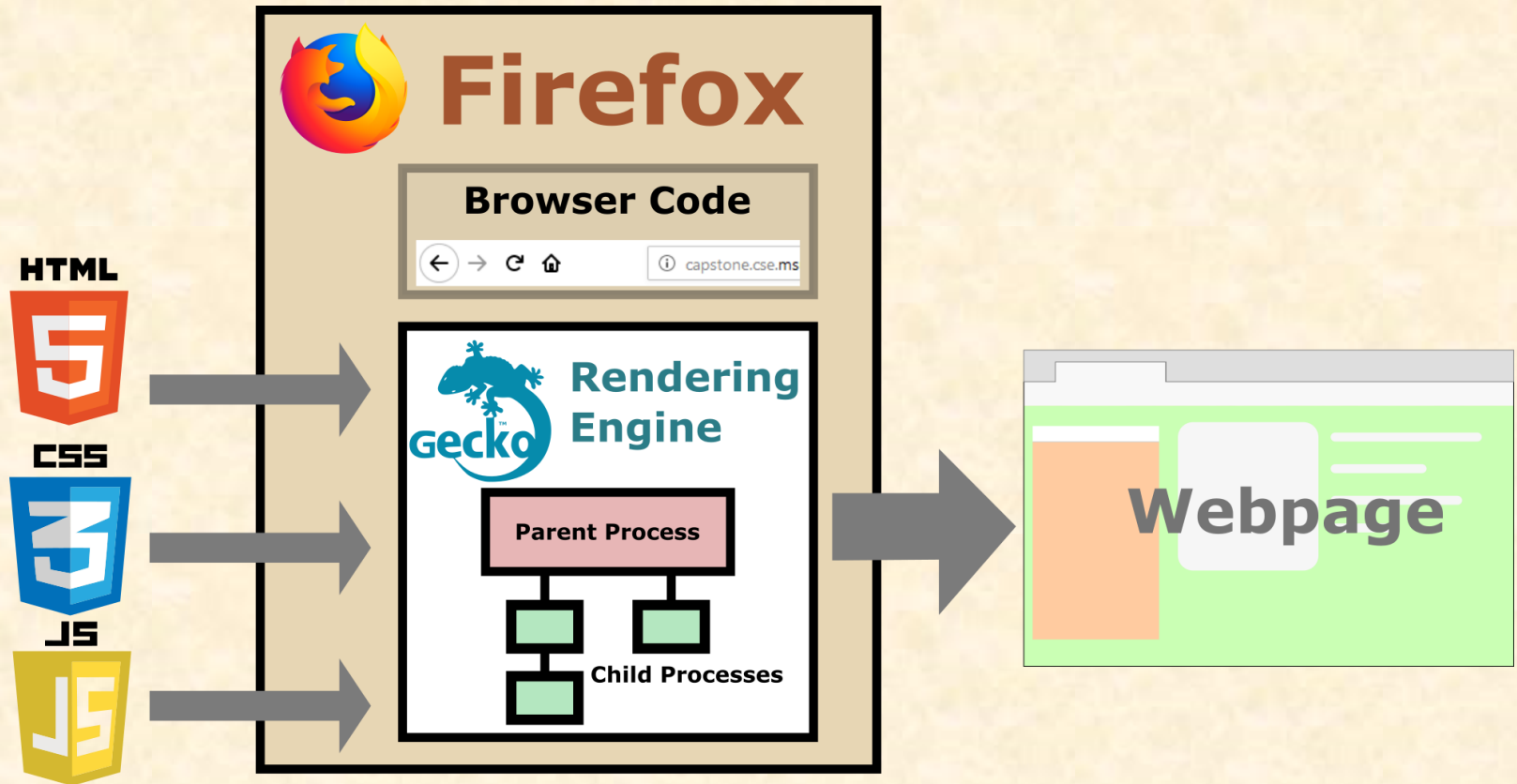
# Project Overview

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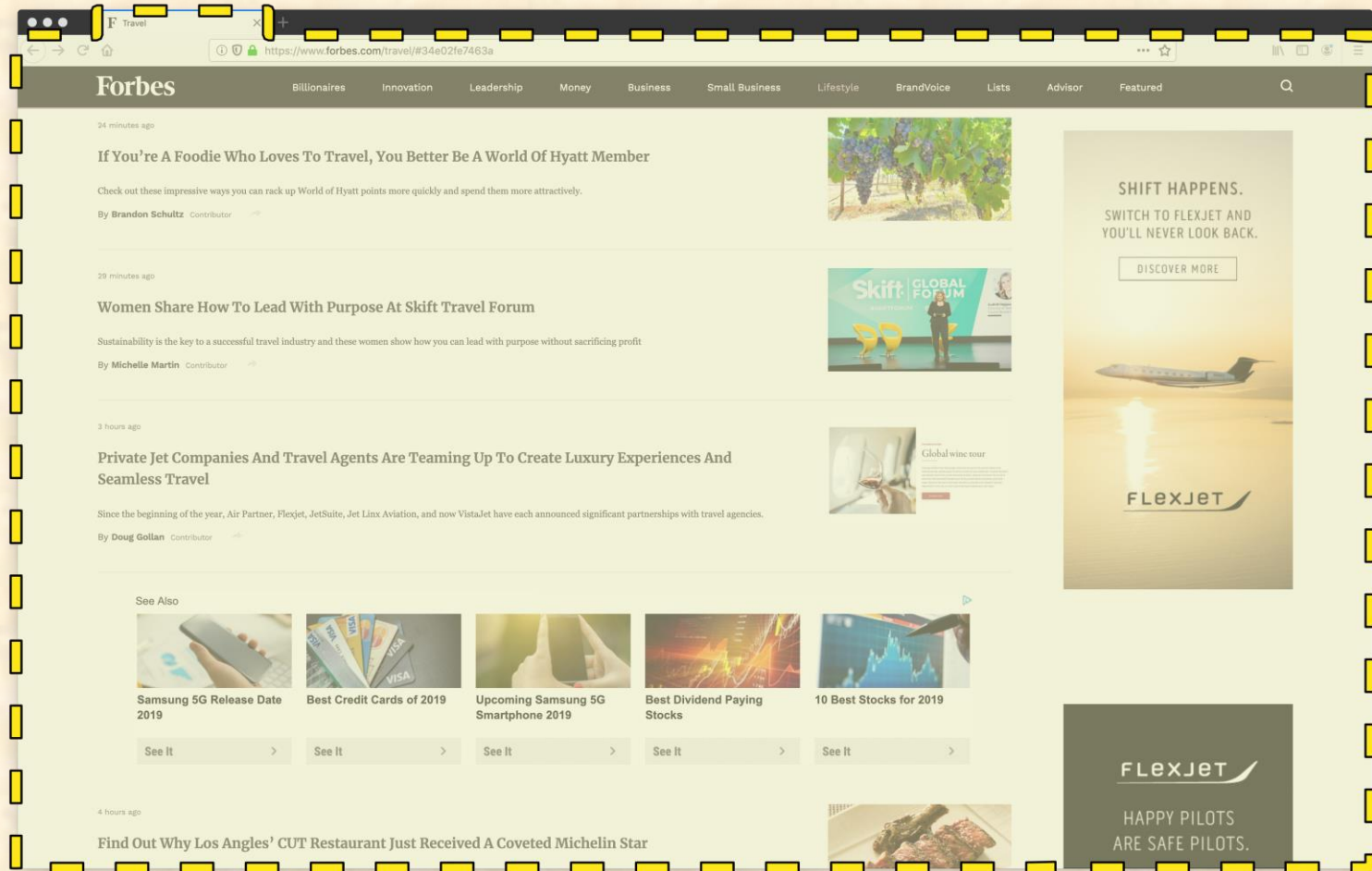
- Working to harden Firefox against Spectre/Meltdown style bugs
- Fission gives content in different frames their own processes
- Our completed work will be integrated into the release version of Firefox



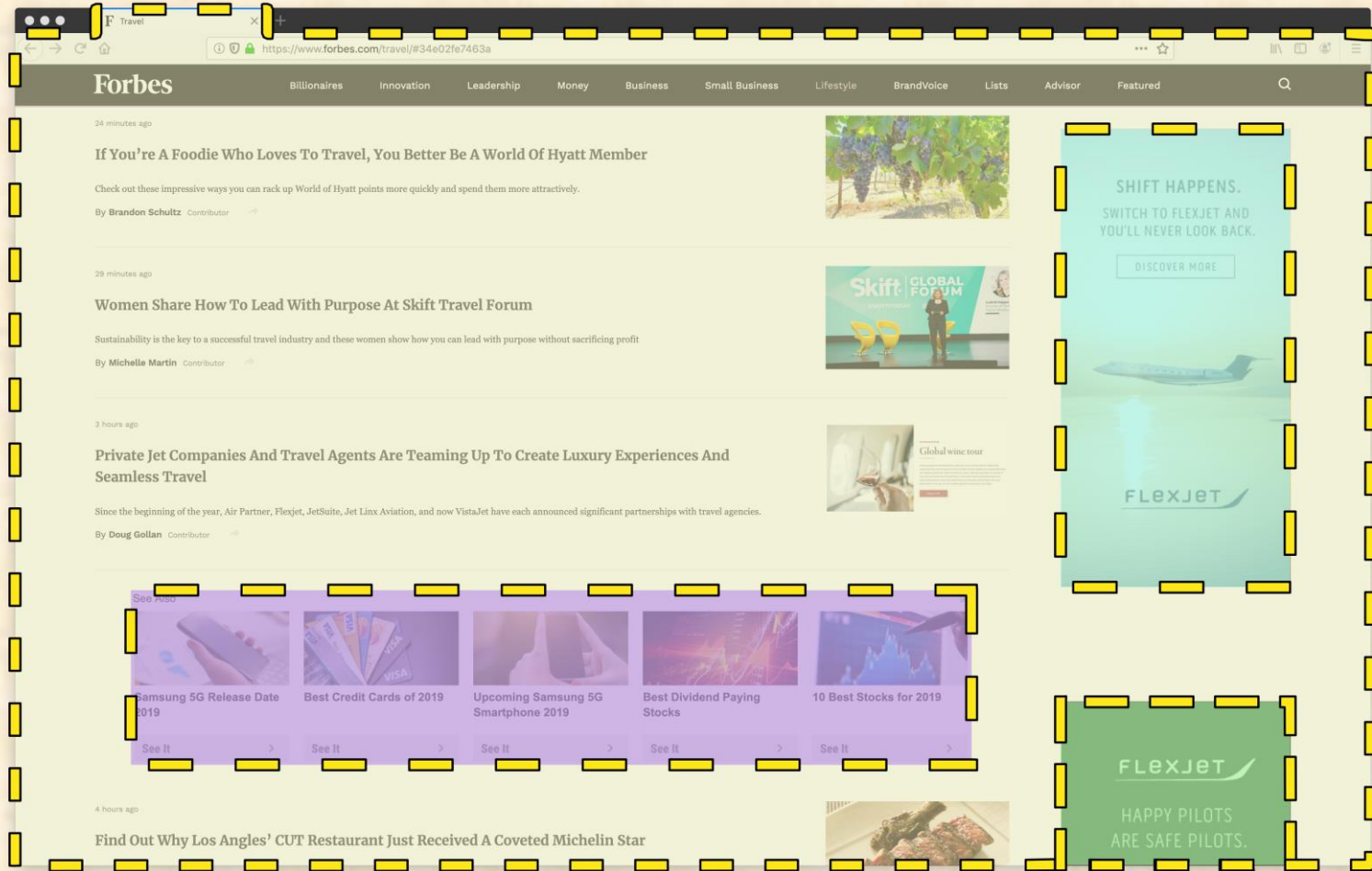
# System Architecture



# Pre-fission Process Separation



# Post-Fission Process Separation



# Example: Forbes.com

The screenshot shows a web browser window displaying a Forbes.com article. The browser's address bar shows the URL <https://www.forbes.com/travel/#4708e404463a>. The article title is "Stockholm's Vasa Museum is built around a renowned 17th century warship that was literally dredged up from the depths of the city's harbor, where it rested for more than 300 years since sinking on its maiden voyage." The author is "By Terrt Colby Contributor".

Below the article is a "See Also" section with five items:

1. Stocks to Buy Today
2. Samsung 5G Release Date 2019
3. 10 Best Stocks for 2019
4. Stocks to Invest in 2019
5. Best Investments for 2019

Each item has a "See It >" button.

The next article is "Kate Middleton And Prince William's Royal Trip To Pakistan: A Major Security Challenge" by Cecilia Rodriguez, published 2 hours ago. The text states: "The Duke and Duchess of Cambridge set off on their most complicated royal tour yet to a troubled country."

The following article is "Delta And Marriott Named Best Airline And Hotel Chain For Business Travelers" by Grant Martin, published 3 hours ago. The text states: "Atlanta-based Delta Air Lines and Bethesda-based Marriott International have been voted as the top airline and hotel chain respectively for business travelers in North America."

The final article is "The Best Places To Eat In Vail & Beaver Creek" published 4 hours ago. The text states: "Dining in Vail and Beaver Creek are another reason to visit this great ski destination."

On the right side of the page, there is a large advertisement for FlexJet. The ad features a sunset background with an airplane flying over the water. The text reads: "SHIFT HAPPENS. SWITCH TO FLEXJET AND YOU'LL NEVER LOOK BACK." Below this is a "DISCOVER MORE" button. The FlexJet logo is at the bottom of the ad.



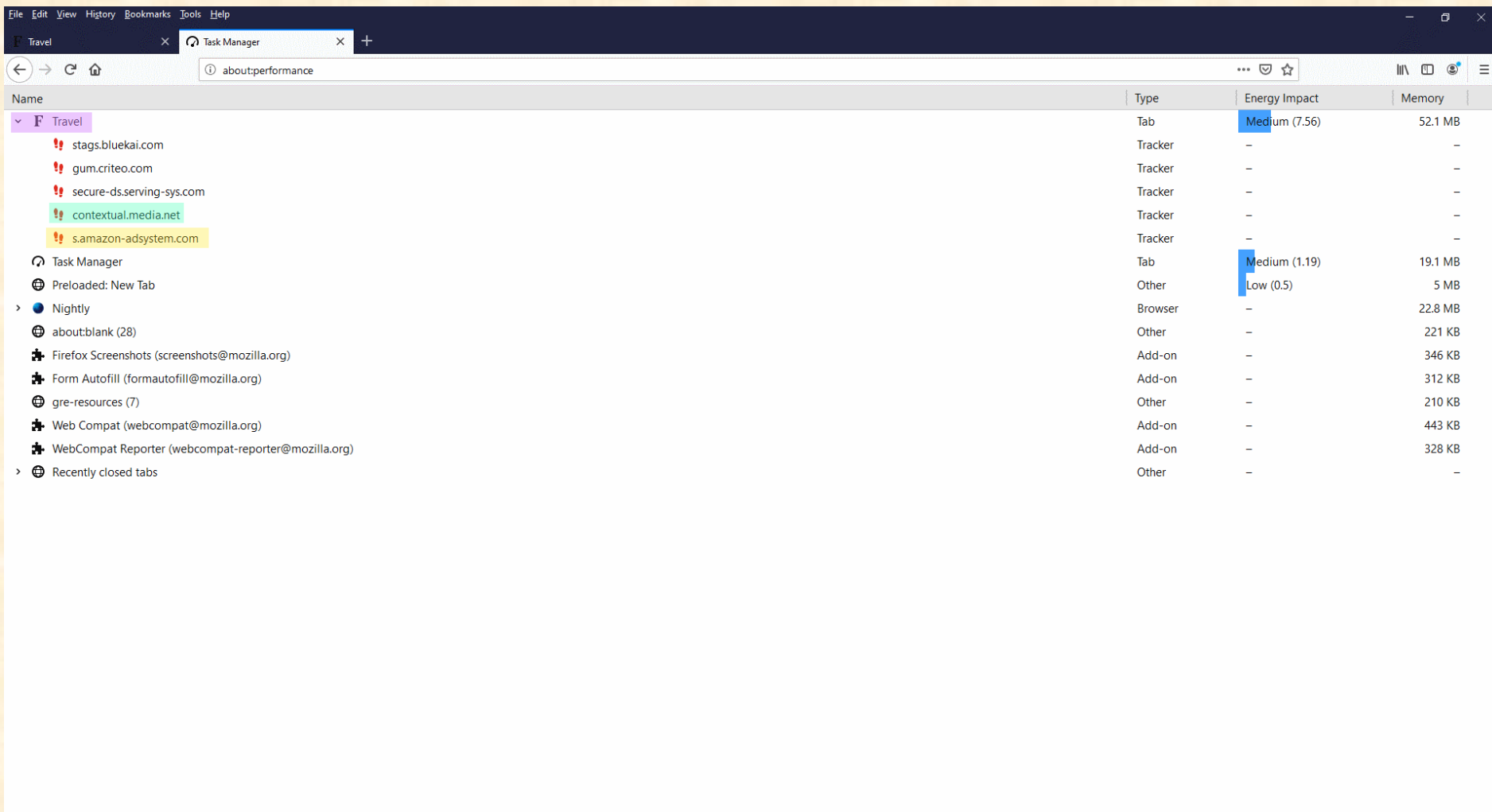
# Example: Forbes.com

The screenshot shows a web browser window with the following content:

- Article 1:** "Stockholm's Vasa Museum is built around a renowned 17th century warship that was literally dredged up from the depths of the city's harbor, where it rested for more than 300 years since sinking on its maiden voyage." By Tern Colby. Includes a thumbnail image of the Vasa Museum.
- See Also section:** A horizontal list of five related articles with thumbnails and "See It >" buttons:
  1. Stocks to Buy Today
  2. Samsung 5G Release Date 2019
  3. 10 Best Stocks for 2019
  4. Stocks to Invest in 2019
  5. Best Investments for 2019
- Article 2:** "Kate Middleton And Prince William's Royal Trip To Pakistan: A Major Security Challenge" by Cecilia Rodriguez. Includes a thumbnail image of the royal couple.
- Article 3:** "Delta And Marriott Named Best Airline And Hotel Chain For Business Travelers" by Grant Martin. Includes a thumbnail image of a hotel room.
- Article 4:** "The Best Places To Eat In Vail & Beaver Creek" (partially visible). Includes a thumbnail image of a sushi platter.

SHIFT HAPPENS.  
SWITCH TO FLEXJET AND YOU'LL NEVER LOOK BACK.  
DISCOVER MORE  
FLEXJET

# Forbes.com without Fission



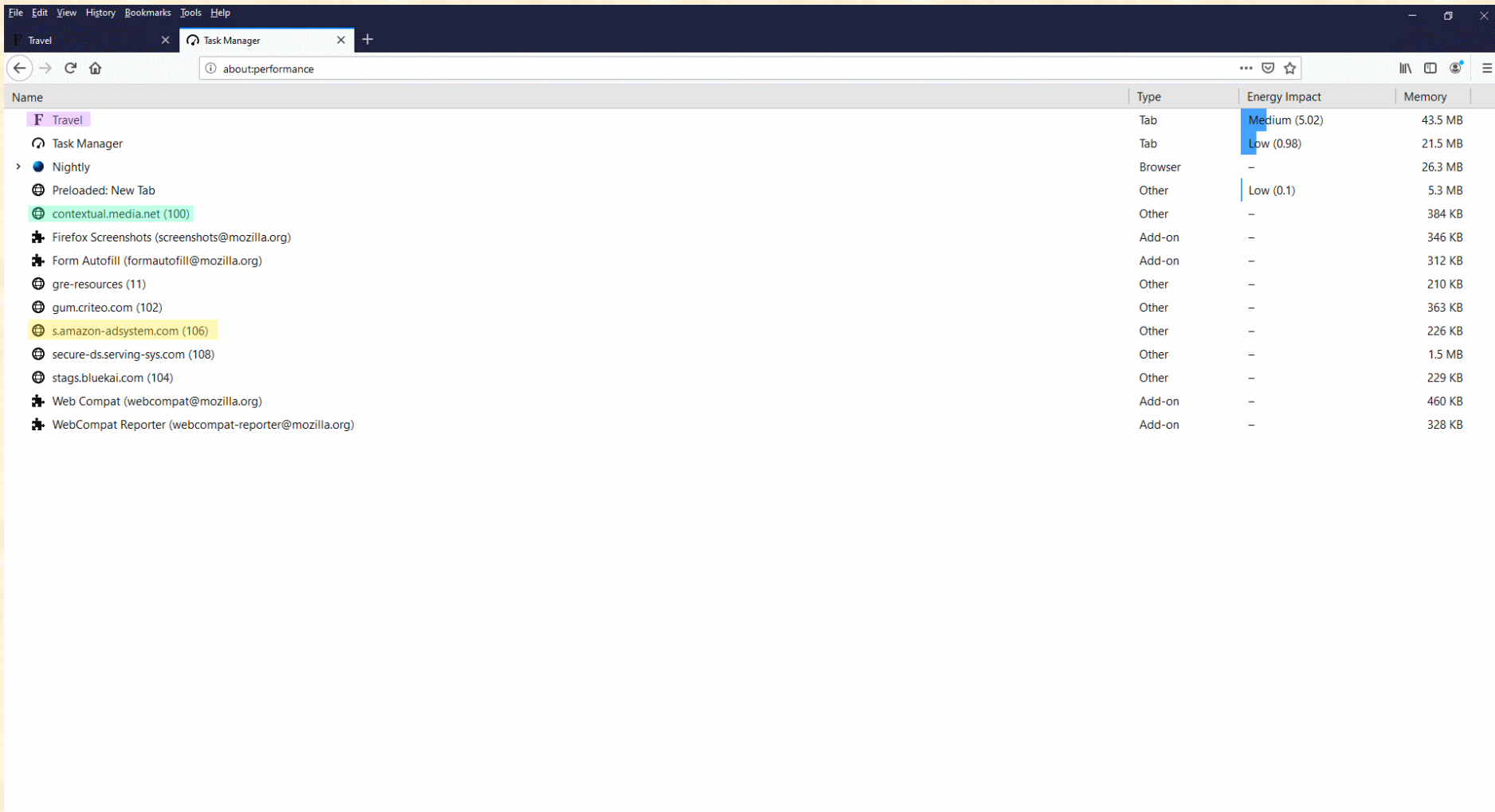
The screenshot shows the Firefox Task Manager interface. The browser window has two tabs: 'Travel' and 'Task Manager'. The address bar shows 'about:performance'. The main content area is a table with columns for Name, Type, Energy Impact, and Memory. The 'Travel' tab is expanded, showing several trackers. The 'Task Manager' tab is also expanded, showing various system components and add-ons.

| Name  | Type    | Energy Impact | Memory  |
|---|---------|---------------|---------|
| Travel  | Tab     | Medium (7.56) | 52.1 MB |
| stags.bluekai.com                                   | Tracker | -             | -       |
| gum.criteo.com                                      | Tracker | -             | -       |
| secure-ds.serving-sys.com                           | Tracker | -             | -       |
| contextual.media.net                                | Tracker | -             | -       |
| s.amazon-adsystem.com                               | Tracker | -             | -       |
| Task Manager  | Tab     | Medium (1.19) | 19.1 MB |
| Preloaded: New Tab                                  | Other   | Low (0.5)     | 5 MB    |
| Nightly   | Browser | -             | 22.8 MB |
| about:blank (28)                                    | Other   | -             | 221 KB  |
| Firefox Screenshots (screenshots@mozilla.org)       | Add-on  | -             | 346 KB  |
| Form Autofill (formautofill@mozilla.org)            | Add-on  | -             | 312 KB  |
| gre-resources (7)                                   | Other   | -             | 210 KB  |
| Web Compat (webcompat@mozilla.org)                  | Add-on  | -             | 443 KB  |
| WebCompat Reporter (webcompat-reporter@mozilla.org) | Add-on  | -             | 328 KB  |
| Recently closed tabs                                | Other   | -             | -       |





# Forbes.com with Fission



The screenshot shows the Firefox Task Manager interface with the 'about:performance' page open. The table below lists the components and their resource usage.

| Name  | Type    | Energy Impact | Memory  |
|---|---------|---------------|---------|
| Travel  | Tab     | Medium (5.02) | 43.5 MB |
| Task Manager  | Tab     | Low (0.98)    | 21.5 MB |
| Nightly   | Browser | -             | 26.3 MB |
| Preloaded: New Tab                                  | Other   | Low (0.1)     | 5.3 MB  |
| contextual.media.net (100)                          | Other   | -             | 384 KB  |
| Firefox Screenshots (screenshots@mozilla.org)       | Add-on  | -             | 346 KB  |
| Form Autofill (formautofill@mozilla.org)            | Add-on  | -             | 312 KB  |
| gre-resources (11)                                  | Other   | -             | 210 KB  |
| gum.criteo.com (102)                                | Other   | -             | 363 KB  |
| s.amazon-adsystem.com (106)                         | Other   | -             | 226 KB  |
| secure-ds.serving-sys.com (108)                     | Other   | -             | 1.5 MB  |
| stags.bluekai.com (104)                             | Other   | -             | 229 KB  |
| Web Compat (webcompat@mozilla.org)                  | Add-on  | -             | 460 KB  |
| WebCompat Reporter (webcompat-reporter@mozilla.org) | Add-on  | -             | 328 KB  |

# What's left to do?

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- Two team members working on second bugs
- Rest of team working on testing their bugs
- Continue to work towards resolving multiple bugs each
- Examples:
  - "about:studies" page
  - Pop-up blocking
  - Firefox "UI Tour" feature



# Questions?

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