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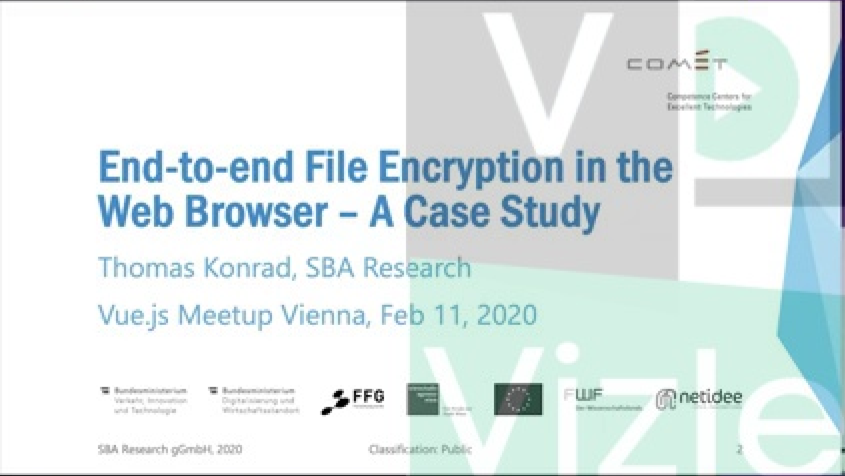

COMET

Competence Centers for Excellent Technologies

# End-to-end File Encryption in the Web Browser – A Case Study

Thomas Konrad, SBA Research

Vue.js Meetup Vienna, Feb 11, 2020

Bundesministerium Verkehr, Innovation und Technologie
Bundesministerium Digitalisierung und Wirtschaftsstandort
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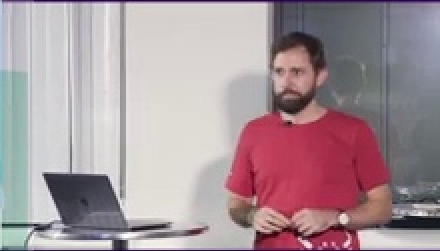

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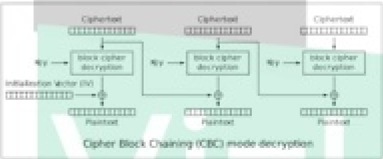
# Ensure Confidentiality, Integrity, and Authenticity

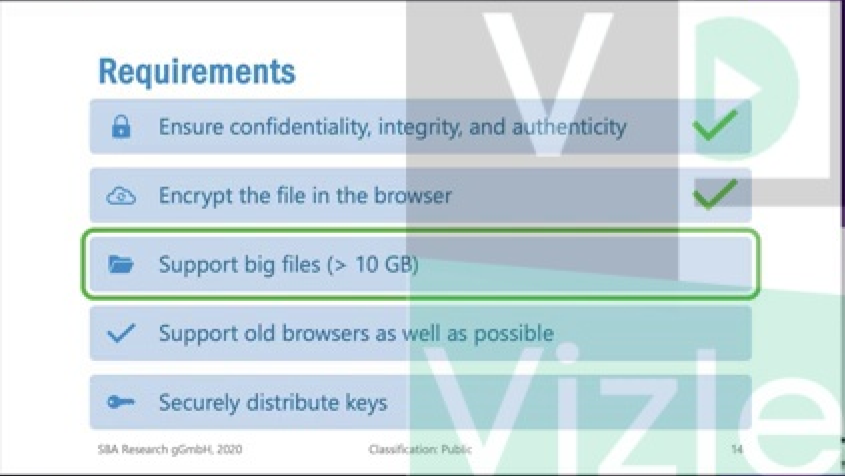
Let’s take as an example **AES** in **CBC** mode.

What do you think we can guarantee with it?

- ✓ **Confidentiality**
- **Integrity**
- **Authenticity**



Cipher Block Chaining (CBC) mode decryption



## Requirements

- 🔒 Ensure confidentiality, integrity, and authenticity ✓
- Encrypt the file in the browser ✓
- Support big files (> 10 GB)
- ✓ Support old browsers as well as possible
- Securely distribute keys

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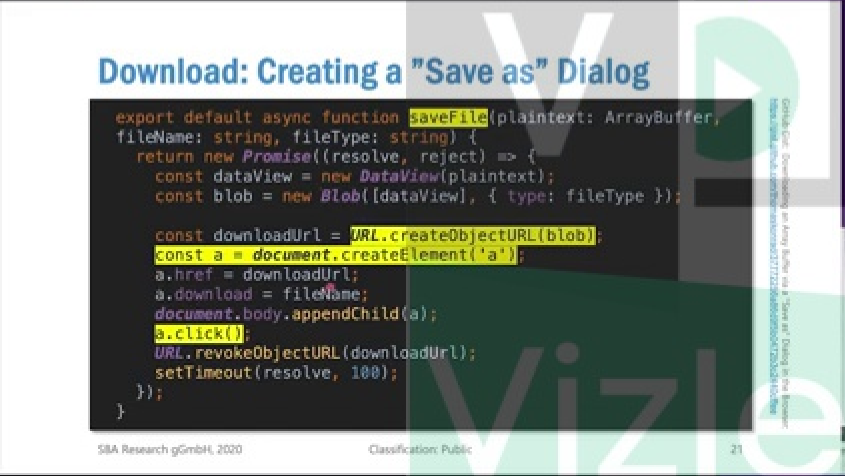

## Download: Creating a "Save as" Dialog

```
export default async function saveFile(plaintext: ArrayBuffer,
fileName: string, fileType: string) {
  return new Promise((resolve, reject) => {
    const dataView = new DataView(plaintext);
    const blob = new Blob([dataView], { type: fileType });

    const downloadUrl = URL.createObjectURL(blob);
    const a = document.createElement('a');
    a.href = downloadUrl;
    a.download = fileName;
    document.body.appendChild(a);
    a.click();
    URL.revokeObjectURL(downloadUrl);
    setTimeout(resolve, 100);
  });
}
```

GitHub Gist: Downloading an Array Buffer via a "Save as" Dialog in the Browser: [illegible]

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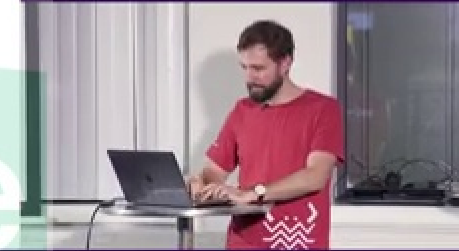
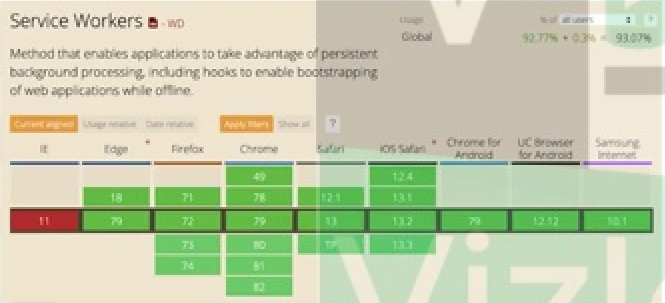


# Service Workers: Browser Support



## Service Workers - WD

Usage: Global 92.77% + 0.3% = 93.07%

Method that enables applications to take advantage of persistent background processing, including hooks to enable bootstrapping of web applications while offline.

| IE | Edge * | Firefox | Chrome | Safari | iOS Safari * | Chrome for Android | UC Browser for Android | Samsung Internet |
|---|---|---|---|---|---|---|---|---|
| | | | 49 | | 12.4 | | | |
| | 18 | 71 | 78 | 12.1 | 13.1 | | | |
| 11 | 79 | 72 | 79 | 13 | 13.2 | 79 | 12.12 | 10.1 |
| | | 73 | 80 | TP | 13.3 | | | |
| | | 74 | 81 | | | | | |
| | | | 82 | | | | | |

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build: build 2.6.0-beta.2
test: dynamic directive arguments for v-on, v-bind and custom directives
perf: improve scoped slots change detection accuracy
test: test cases for v-on/v-bind dynamic arguments
refactor: v-bind dynamic arguments use bind helper
test: handle dynamic arguments for v-bind.sync
origin/slot-optimization
test: dynamic directive arguments for v-bind and v-on
fix: fix checkbox event edge case
test: fix tests in IE/Edge

# Demo Time!

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