

Web and Networks IG:  
*Edge Computing Web Exploration*

TPAC 2022

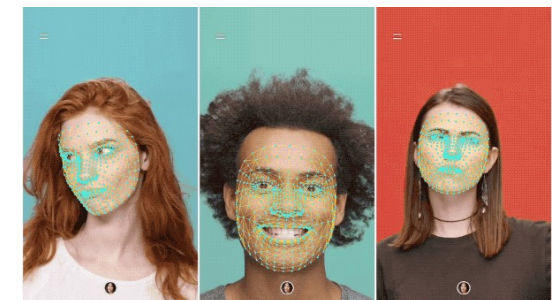
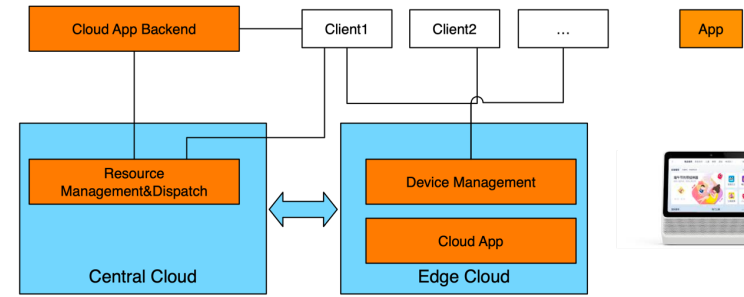
13 September 2022

# Outline

- Summary (40m)
  - Explainer
    - Repo: <https://github.com/w3c/edge-computing-web-exploration>
    - Rendered: <https://w3c.github.io/edge-computing-web-exploration/>
  - Use cases
  - Stakeholders
  - General Requirements
  - Detailed Requirements
  - Proposals
- Discussion (20m)

# Use Cases (Accelerated work loads, 1/2)

- [Cloud App](#)
- [VR/AR Acceleration](#)
- [Cloud Gaming](#)
- [Streaming Acceleration](#)
- [Online Video Conference](#)
- [Machine Learning Acceleration](#)
- [Image and Video Processing and Understanding](#)



# Use Cases(Accelerated work loads, 2/2)

- [Professional Web-based Media Production](#)
- [Background Rendering](#)
- [Live video broadcasting mobile application](#)
- [Automatic License Plate Recognition](#)
- [Robot Navigation Acceleration](#)
- [Child Monitor](#)



# Stakeholders

| P | Abbv | Category                      | Business Model   | Motivation   |
|---|------|-------------------------------|--|--|
|   | BWSR | Browser Vendor                | OSS - supported by other business (e.g. CSP, ads/search)                   | More applications can use web                      |
|   | CSP  | Cloud Service Provider        | Usage or subscription, account based (service provider pays)               | Offer edge computing service.                      |
|   | CDN  | Content Distribution Network  | Usage or subscription, account based (service provider pays)               | Offer edge computing service                       |
|   | ISP  | Internet Service Provider     | Subscription/rental; HW sales in some cases                                | Offer edge computing service                       |
|   | HW   | Hardware Vendor               | Sale or rental   | Desktops/servers as private edge computers         |
|   | NET  | Mobile Network Provider (MEC) | Usage or subscription, account based (user pays)                           | Offer compute utility service                      |
|   | OS   | Operating System Vendor       | Sale or subscriptions to OS licenses; HW co-sales                          | HW co-sales for edge computers                     |
|   | APPL | Application Developer         | Sale or subscription to software licenses (or in some cases, ad supported) | Avoid limitations of client and/or cloud platforms |
|   | SVC  | Web Service (API) Provider    | Usage or subscription, account based (user pays)                           | Improved deployment options; increased usage       |
|   | USER | End User                      | Direct payment, bundled cost, or private HW                                | Improved performance, lower latency                |

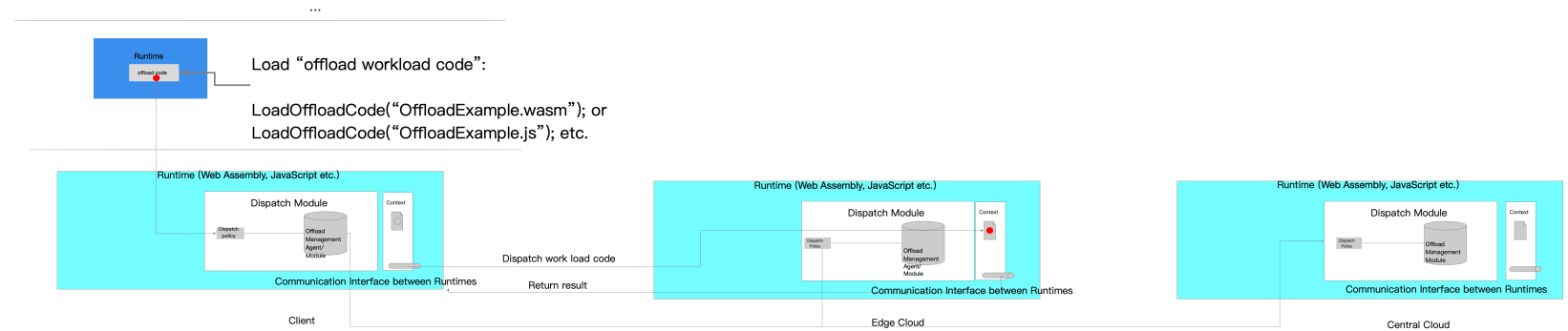
# General Requirements

| P | Name          | Description   |
|---|---------------|---|
|   | Performance   | The overall performance of an application using offload, as measured by user responsiveness or time to completion of computational work as appropriate, should be improved. |
|   | Scalability   | Efficient implementation in a virtualized cluster environment (i.e. a cloud system) should be achievable.   |
|   | Flexibility   | The solution should allow a variety of compute resources from different providers to be used.   |
|   | Compatibility | The proposed standards should be as consistent as possible with existing web standards to maximize adoption.  |
|   | Resiliency    | The solution should allow adaptation to changing circumstances such as changes in relative performance, network connectivity, or failure of a remote Computing Resource.    |
|   | Security      | The standards should be consistent with existing security expectations for web applications.  |
|   | Privacy       | The standards should be consistent with existing privacy expectations for web applications.   |
|   | Control       | The use of resources should ultimately be under the control of the entity responsible for paying for their use.   |

# Proposals

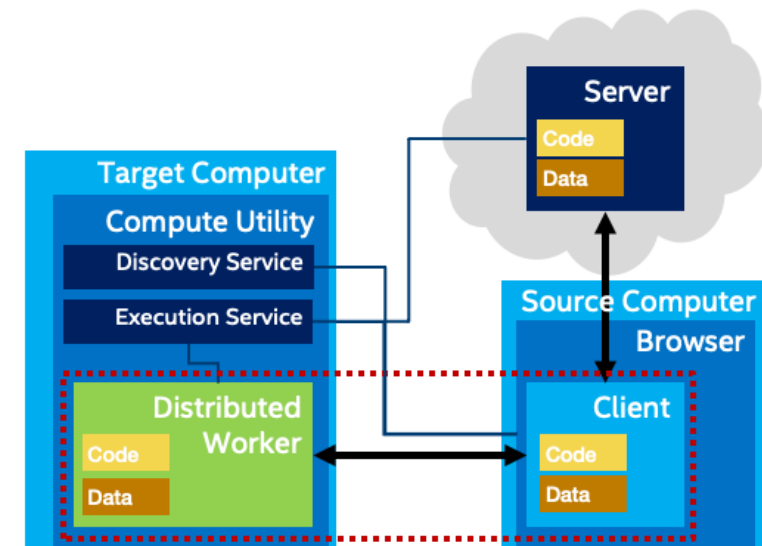
## Seamless Code Sharing

- Seamlessly migrate WASM code between cloud and edge.



## Distributed Worker

- Extend existing Worker API to support distributed computing using a discoverable compute utility service.



# Discussion (20m)

- Prioritization
  - Use cases
  - Requirements
- Workload packaging
  - JS? WASM?
- Compatibility
  - New API or extension of an existing one?
- Additional Stakeholders, Use Cases, or Requirements?



# Next Steps

- Use github for raising issues (or PRs)
  - <https://github.com/w3c/edge-computing-web-exploration/issues>
- Participate in WNIG (or CG) meetings
  - <https://www.w3.org/groups/ig/web-networks/calendar>