

Web and Networks IG: *Edge Computing Web Exploration*

TPAC 2022

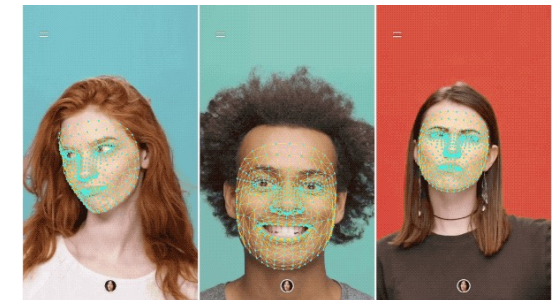
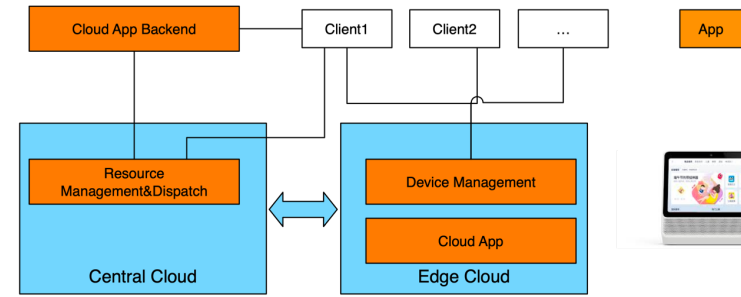
13 September 2022

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

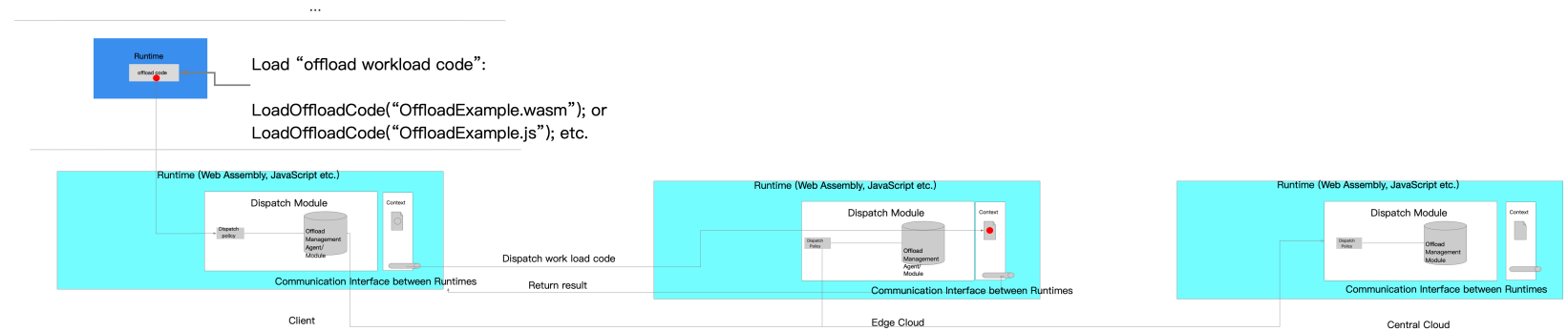
General Requirements

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

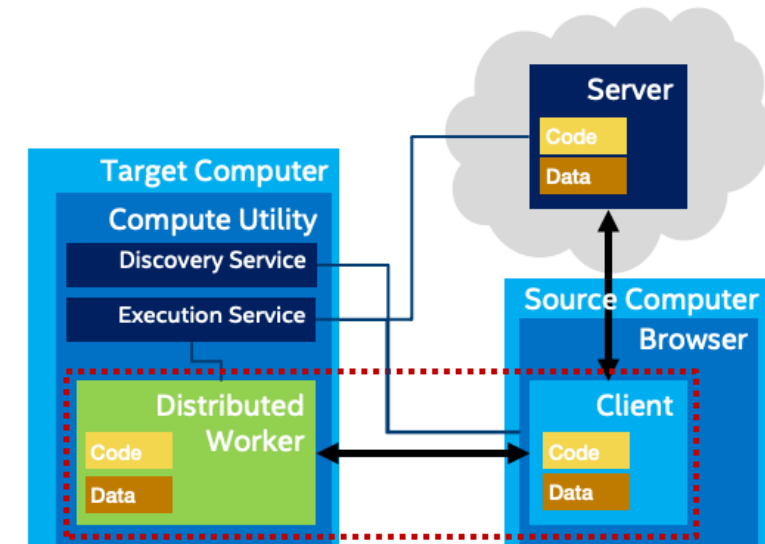
Seamless Code Sharing

- 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 and Requirements
- Workload packaging
 - JS? WASM?
- Compatibility
 - New API or extension of an existing one?
- Additional Stakeholders, Use Cases, or Requirements?
- Security and Privacy
 - Trust model, control (user/dev → diff stds?), relationship to business model
 - Relationship to same-origin, CORS, OAuth2, etc.; isolation vs sandboxing
 - User categories: home, enterprise, dev; code (w/ constrained conn) vs. data
 - Look at trust-over-IP, Web3, SOLID, LAN-PSK, DID/VC

Next Steps

- Use github for raising issues (or PRs)
 - <https://github.com/w3c/edge-computing-web-exploration/issues>
 - Capture feedback from this mtg
- Participate in WNIG (or CG) meetings
 - <https://www.w3.org/groups/ig/web-networks/calendar>
 - Do we need a dedicated call series? CG? Workshop?
- Needs improvement
 - Trust model; gap analysis and potential resolutions; business models
- Improve stakeholder (re)engagement
 - Motivation
- Draft charter for WG?
 - What deliverables?