W3C WEB & NETWORKS INTEREST GROUP

TPAC 2022 IG MEETING
SEPTEMBER 13TH

Chairs:

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WELCOME!

- Welcome to the TPAC 2022 W3C Web & Networks IG Meeting

- W3C meetings operate under the Principles and Procedures of our Positive Work Environment at W3C: Code of Ethics and Professional Conduct

- Patent Disclosures

Please see the W3C Patent Policy

- IRC Channel https://irc.w3.org/?channels=#web-networks

Channel: #web-networks

AGENDA

- Web & Networks Overview: 20min
- Edge Use Cases & Requirements : 40min
- Open Discussion : 20min

WEB & NETWORKS INTEREST GROUP OVERVIEW

*The **mission** of the Web & Networks Interest Group is to explore solutions for web applications to **leverage network capabilities** in order to achieve better performance and resources allocation, both on the device and network.*

Key Topics in scope (from the charter):

- **Application hints to the network** (e.g., ways for applications to declare their operational wishes to the network).
- **Network hints to device applications** to enable moving of compute functions across the network between client, edge or cloud depending on user-experience and compute requirements, and optimal resource utilization.
- **Exposure of specialized services** such as DiffServ, 5G Slices, WebTransport and Edge Computing, including load balancing computing between client devices, edge and cloud, particularly in latency-sensitive applications like Machine Learning inference and Cloud Gaming.
- **Evaluation of aggregated web metrics** for enhanced troubleshooting and network performance optimization to improve web application experience.

Web & Networks Interest Group Charter (w3.org)

End Date: 30 April 2023

FOCUS AREAS

The group is currently focused on:

- **Edge Computing** with the objective of understanding the impact of edge computing for Web applications and build a roadmap to enable its adoption
- **Network Quality Monitoring and Prediction** with the goal of improving how Web apps can monitor and prepare for changes in network conditions
- **Network Emulation Browser Tools and Trace Formats**

TASKS

- Identify **opportunities** for network and application collaborations
- **Liaise and coordinate** with relevant networking standards organizations
- Collaborate with W3C Working and Interest Groups
- Share the latest developments in **networking standardization bodies.**
- Propose **incubation of new work**
- Represent **knowledge** about networking technologies
- Provide guidelines to **browser developers**
- Provide guidelines to web **application developers**

DELIVERABLES

- The primary deliverables of the Web & Networks Interest Group are IG Notes that identify
  1. **List of new use-cases and innovations** in networking domain that can benefit Web applications
  2. **Requirements** for existing and/or new technical specifications
  3. **Gap-analysis** between use-case requirements and current Web Platform standards
- **Maintain a public list** of the network-related features on the Web that it is tracking and investigating.

Wiki: Web & Networks Interest Group (w3.org)

EDGE COMPUTING FOR THE WEB

- The following themes have been identified to guide our initial exploration:
  - ❑ understanding in what context and for what use cases **edge computing** might be used in Web applications
  - ❑ sketching what approach to **offloading computing tasks** from the browser to an edge node might require architecturally
  - ❑ understanding if the **"split-browser"** model built for cloud-based rendering of Web pages needs more attention in an edge-enabled world
- We ideas on compute offload to the edge using:
  - WebWorker
  - WebAssembly
  - ServiceWorker

Collecting use cases and requirements on the wiki

EDGE COMPUTING FOR THE WEB

Presentations:

- Client-Edge-Cloud Coordination: Alibaba, CMCC, Intel
- Video Cloud Service : CMCC
- MEC in action: An overview of Edge Computing activities : Intel
- Accelerating DNNs for Web with Edge Computing : BUPT
- EDGE Applications: Supporting an Ambient Computing Ecosystem: Intel
- Distributed Web Browser : Samsung
- Seamless offloading of Web App via Web Worker Migration : Seoul University
- P2P eCDN Overview: Peer5

NETWORK QUALITY MONITORING AND PREDICTION

- The **primary goal** of the workstream is to **study use-cases** that can benefit by using network quality information, either instantaneous or predicted values, to adapt to varying network conditions.
- The **secondary goal** is to **identify requirements,** both from application or network perspective, such that the right network quality parameters are monitored and used to improve the quality of experience of the use-case.
- The workstream discusses **similar existing APIs** proposed for web browsers in the past
- Detailed findings are maintained on the wiki and the group keeps issues in github

NETWORK QUALITY MONITORING AND PREDICTION

Presentations:

- Link Performance Prediction: Intel
- Lessons from Network Information API WICG: Google
- Predictive QoS for Edge Computing : Insights from 5GAA: Intel
- Multicast Receiver : Akamai

NETWORK EMULATION BROWSER TOOLS AND TRACE FORMATS

The use cases discussed:

- Developers run **automatic-test** on their site loading under different network conditions and find invisible performance bottlenecks.
- **Trace format** requirements, to design programmatic traces, including modifications to existing traces.
- Important parameters for Web developers, **Bandwidth, latency, packet loss / re-ordering**.
- PWA Application testing, real-time and latency-sensitive apps testing for WebRTC, Cloud Gaming and WebTransport scenarios.

NETWORK EMULATION BROWSER TOOLS AND TRACE FORMATS

Presentations:

- Network Trace Emulation and Test Toolkit for Browser Developer Tools: Intel
- Existing Network Emulation Tools and Trace formats study: WNIG Workstream/CMCC

Thank you