

서버리스 컴퓨팅을 위한 EdgeWorkers 및 EdgeKV의 소개와 활용 방안

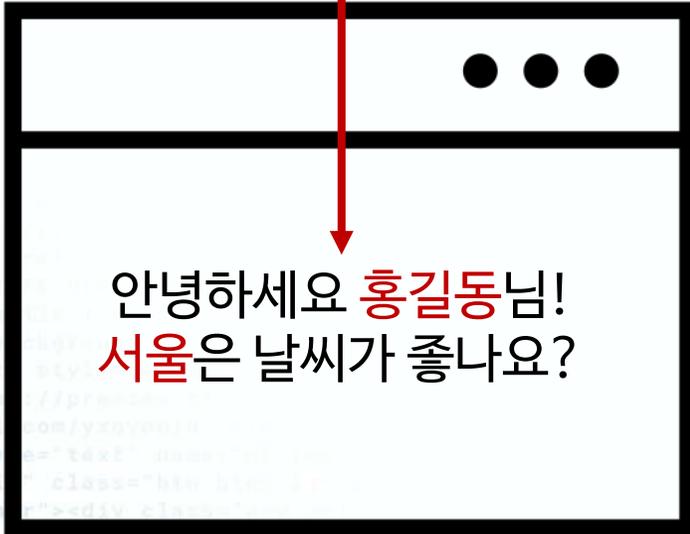
Solutions Engineer
강상진 상무



특정 조건을 활용한 동적 콘텐츠



동일한 로그인 서버



동적 콘텐츠

동적 콘텐츠 (Dynamic Contents)

- 웹 사이트가 느려져도 꼭 필요하다.
 - 웹 서버 자원을 소비한다.
 - 다양한 로직이 존재한다.
 - 개발자가 코딩한다.
 - 운영 인프라를 사용한다.
 - 개발 비용이 상승한다.
- CDN에서 캐싱하기 어렵다.

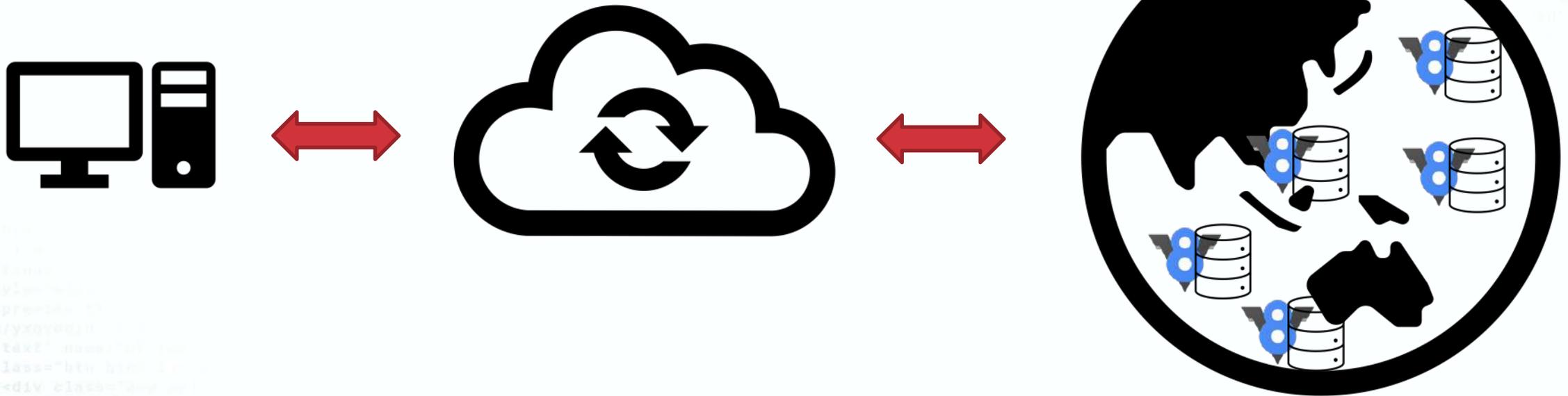
...

EdgeWorkers 컨셉

최대한 **많은** 로직을
엣지에서 **쉽게** 처리하자.

오리진의 웹 서버에서 운영하는
프로그래밍 영역까지..

EdgeWorkers



EdgeWorkers 사용 사례



엣지 컴퓨팅을 사용한 EdgeWorkers

	Akamai의 엣지 컴퓨팅	일반적인 서버리스 컴퓨팅
의미	사용자 부근의 엣지에서 실행되는 컴퓨팅	별도의 인프라 준비없이 서버리스 인스턴스 사용
서버 위치	사용자 인접한 PoP(엣지 로케이션)	특정 클라우드 리전 혹은 엣지 로케이션
실행 엔진	Akamai(Chrome V8, WebAssembly)	프로그래밍 환경 별로 다양
실행 성능	Latency를 최소화하는 Last mile	사용자와 서버리스 리전이 멀수록 감소
cold start	Akamai < 5ms, AVG. 50-200ms	약 50-500ms

EdgeWorkers 장점

- 서버리스 컴퓨팅 in 엣지 컴퓨팅을 통한 빠른 응답
- 엣지 매핑에 의한 오토스케일링 (Auto-Scaling)
- 엣지에서 로직 수행을 통한 오리진 Offload
- DevOps를 위한 CI/CD의 구현 (Akamai Pipeline 연계)
- Akamai as Code (+ TerraForm, Ansible, GitHub 등)
- 안전한 스크립트@엣지 (HTTPS 구간 활용 및 코드의 안전한 저장)

EdgeWorkers Use Case

- Geolocation 서비스 (사용자 접속 위치에 따른 로직)
- 검색 키워드 자동 완성 - EdgeKV에 저장된 검색 키워드 사용
- URL 디코딩 / 경로 Redirection
- DCA (Dynamic Content Assembly) 대신 개인화 페이지 구현
- HTTP 헤더 크기 조정 (Cookie를 비롯한 불필요한 헤더 삭제)
- 인증 (Authentication) @Edge
- 광고 캠페인 - 접속 위치, 단말, Cookie 등의 사용자 정보를 참조한 광고

EdgeWorkers의 구현

main.js

```
// List of currently US embargoed countries,
const embargoedCountries = ['IR', 'KP', 'SY', 'SD', 'CU', 'VE', 'N/A'];

export function onRequest(request) {
  // Collect the end user's country based on Akamai EdgeScape data
  const country = (request.userLocation.country) ? request.userLocation.country : 'Not Found';
  const city = (request.userLocation.city) ? request.userLocation.city : 'Not Found';

  // Check if end user's country is in embargo list
  const embargoed = embargoedCountries.includes(country);

  // Provide appropriate messaging based on embargo status
  if (!embargoed) {
    request.respondWith(200, { 'Content-Type': ['text/html;charset=utf-8'] },
    '<html><body><h1>Hello ' + country + '/' + city + ' from Akamai
    EdgeWorkers!</h1></body></html>');
  } else {
    request.respondWith(403, { 'Content-Type': ['text/html;charset=utf-8'] },
    '<html><body><h1>Sorry, users from ' + country + '/' + city + ' may not view this
    content</h1></body></html>', 'EW-embargo');
  }
}
```

배포 후 결과 확인

```
$curl -s https://demo.brandonkang.net/helloworld
<html><body><h1>Hello KR/SEOUL from Akamai EdgeWorkers!</h1></body></html>%
```

bundle.json

```
{
  "edgeworker-version": "1.2",
  "description": "Hello World Example"
}
```

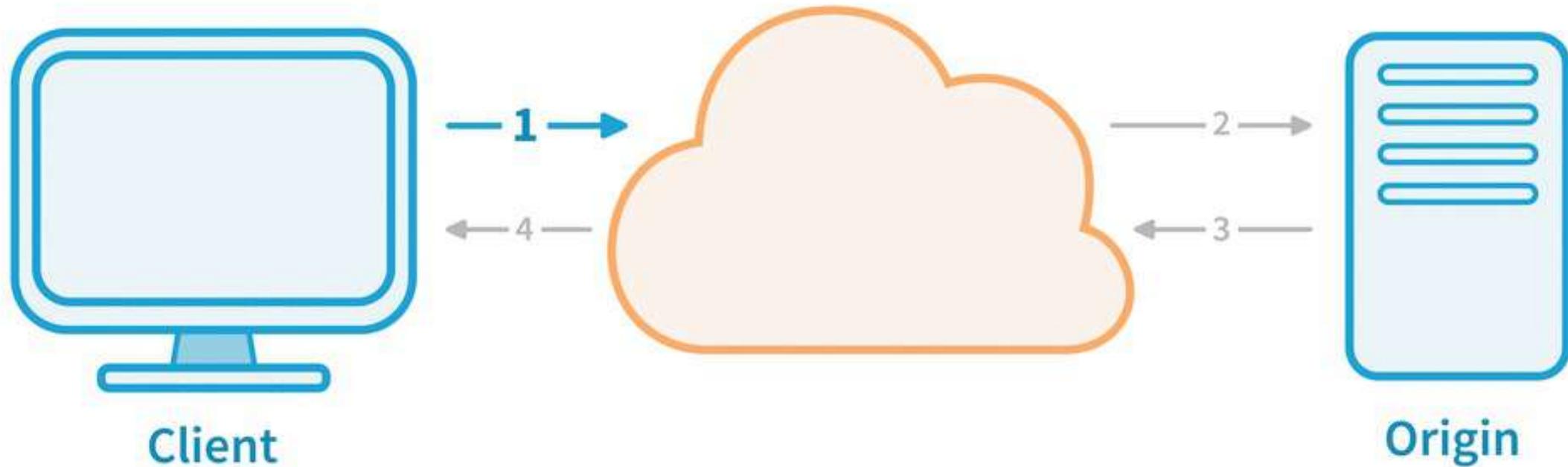
tar 압축 후 ACC 등록과 배포

```
tar -czvf myedgewk.tgz main.js bundle.json

% tar -czvf myedgewk.tgz main.js bundle.json
a main.js
a bundle.json

% ls
bundle.json          myedgewk.tgz
main.js
```

EdgeWorkers 작동 구간



EdgeWorker 로직은 아래 4개의 Phase 별로 구현하여 해당 단계에서 수행하도록 개발

- 1) OnClientRequest 2) OnOriginRequest 3) OnOriginResponse. 4) OnClientResponse

EdgeWorkers 샘플 코드

//This event only happens if the response is not served from cache and not constructed on the edge.

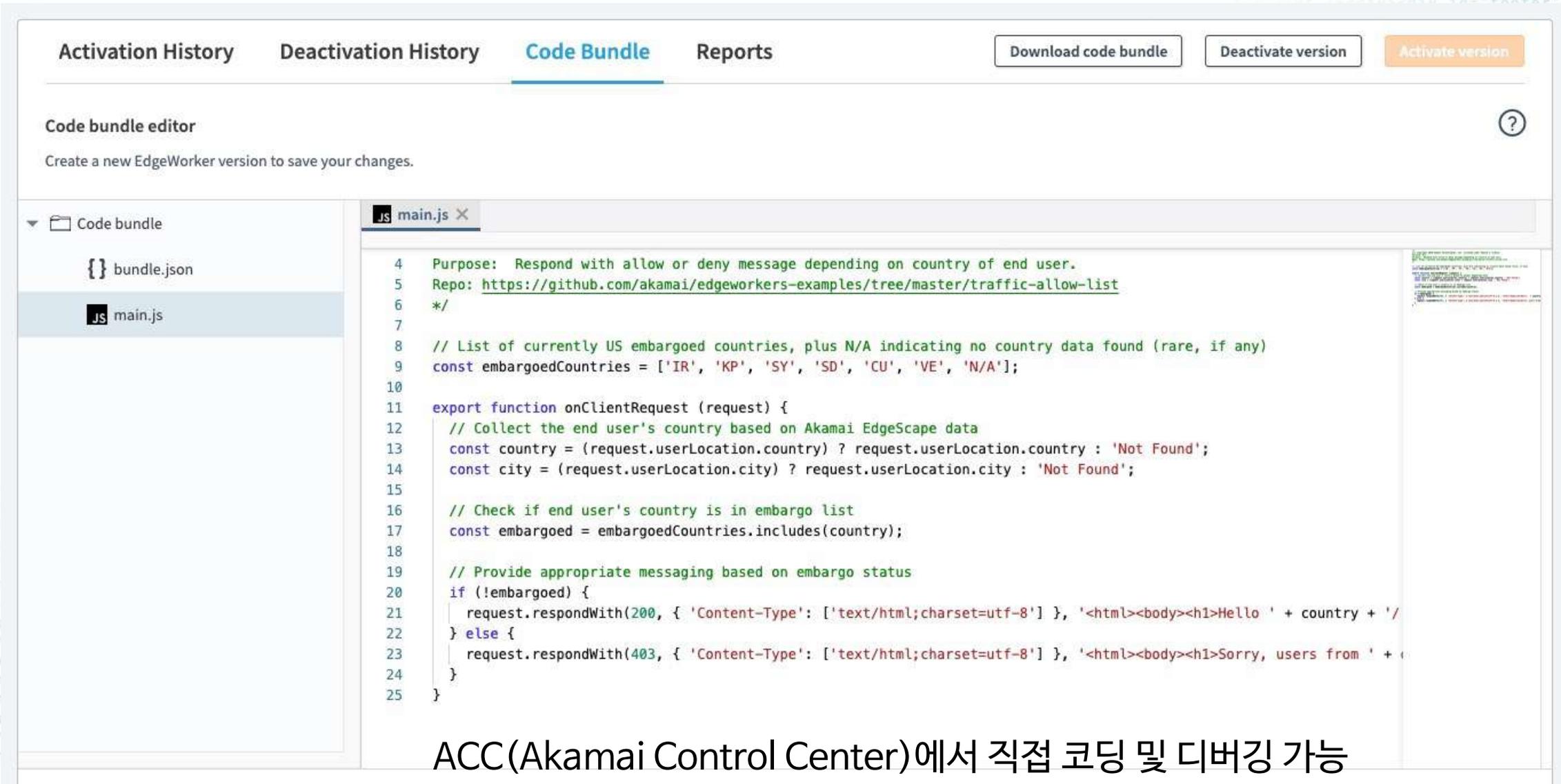
```
export function onOriginRequest(request) {
  if (request.device.isMobile) {
    request.setHeader('X-MyHeader-DeviceType', 'Mobile');
  }
  else if (request.device.isTablet) {
    request.setHeader('X-MyHeader-DeviceType', 'Tablet');
  }
  else {
    request.setHeader('X-MyHeader-DeviceType', 'Desktop');
  }
}
```

//This event happens as the origin response is created.

```
export function onOriginResponse (request, response) {
  response.addHeader('Origin-Response-Status', response.status);

  if (response.status === 503) {
    var retry = parseInt(response.getHeader('Retry-After')) || 10;
    request.respondWith(200, { 'Content-Type': ['text/html'] }, '<html><script> setTimeout(function () { window.location.href="" +
    escape(request.path) + ""};, ' + retry + '*1000);</script>
    <body>The origin server is currently overloaded, please retry in ' + retry + ' seconds </body></html>');
  }
}
```

EdgeWorkers의 구현



Activation History Deactivation History **Code Bundle** Reports

Download code bundle Deactivate version Activate version

Code bundle editor

Create a new EdgeWorker version to save your changes.

Code bundle

- bundle.json
- main.js**

```
4 Purpose: Respond with allow or deny message depending on country of end user.
5 Repo: https://github.com/akamai/edgeworkers-examples/tree/master/traffic-allow-list
6 */
7
8 // List of currently US embargoed countries, plus N/A indicating no country data found (rare, if any)
9 const embargoedCountries = ['IR', 'KP', 'SY', 'SD', 'CU', 'VE', 'N/A'];
10
11 export function onRequest(request) {
12   // Collect the end user's country based on Akamai EdgeScape data
13   const country = (request.userLocation.country) ? request.userLocation.country : 'Not Found';
14   const city = (request.userLocation.city) ? request.userLocation.city : 'Not Found';
15
16   // Check if end user's country is in embargo list
17   const embargoed = embargoedCountries.includes(country);
18
19   // Provide appropriate messaging based on embargo status
20   if (!embargoed) {
21     request.respondWith(200, { 'Content-Type': ['text/html;charset=utf-8'] }, '<html><body><h1>Hello ' + country + '
22   } else {
23     request.respondWith(403, { 'Content-Type': ['text/html;charset=utf-8'] }, '<html><body><h1>Sorry, users from ' + c
24   }
25 }
```

ACC(Akamai Control Center)에서 직접 코딩 및 디버깅 가능

EdgeWorkers의 구현

```
main.js — EW_SampleCodes  
EXPLORER  
OPEN EDITORS  
EW_SAMPLECODES  
  .vscode  
  3rdAPICall  
  API_Orchestration  
  AutoComplete  
  helloworld  
    {} bundle.json  
    JS main.js  
    ≡ myedgewk.tgz  
  helloworld2  
  helloworld3  
  Logger  
  storelocator  
  data  
    {} kr_locations.json  
    {} locations.json  
  dist  
  node_modules  
  .gitignore  
  {} bundle.json  
  JS main.js  
  {} package-lock.json  
  {} package.json  
main.js helloworld X JS main.js 3rdAPICall JS lib.js  
helloworld > JS main.js > onClientRequest  
1 // List of currently US embargoed countries, plus N/A indicating no country data found (rare, if any)  
2 const embargoedCountries = ['IR', 'KP', 'SY', 'SD', 'CU', 'VE', 'N/A'];  
3  
4 export function onClientRequest (request) {  
5   // Collect the end user's country based on Akamai EdgeScope data  
6   const country = (request.userLocation.country) ? request.userLocation.country : 'Not Found';  
7   const city = (request.userLocation.city) ? request.userLocation.city : 'Not Found';  
8  
9   // Check if end user's country is in embargo list  
10  const embargoed = embargoedCountries.includes(country);  
11  
12  // Provide appropriate messaging based on embargo status  
13  if (!embargoed) {  
14    request.respondWith(200, { 'Content-Type': ['text/html;charset=utf-8'] }, '<html><body><h1>Hello  
15  } else {  
16    request.respondWith(403, { 'Content-Type': ['text/html;charset=utf-8'] }, '<html><body><h1>Sorry,  
17  }  
18 }  
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL  
sakang@sel-mpyws EW_SampleCodes % curl -s https://demo.brandonkang.net/helloworld  
<html><body><h1>Hello KR/SEOUL from Akamai EdgeWorkers!</h1></body></html>  
sakang@sel-mpyws EW_SampleCodes %
```

EdgeWorkers의 구현

Criteria Add Match

If 🔗

Behaviors Add Behavior

EdgeWorkers **BETA**

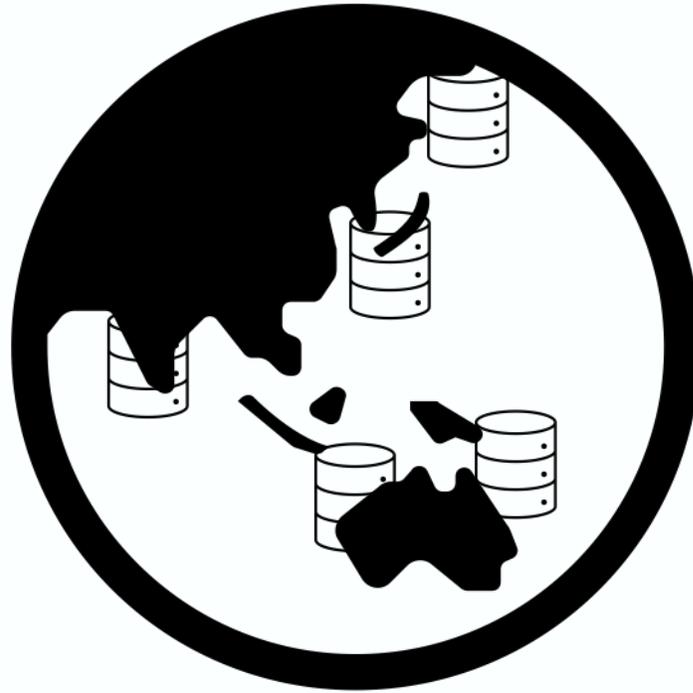
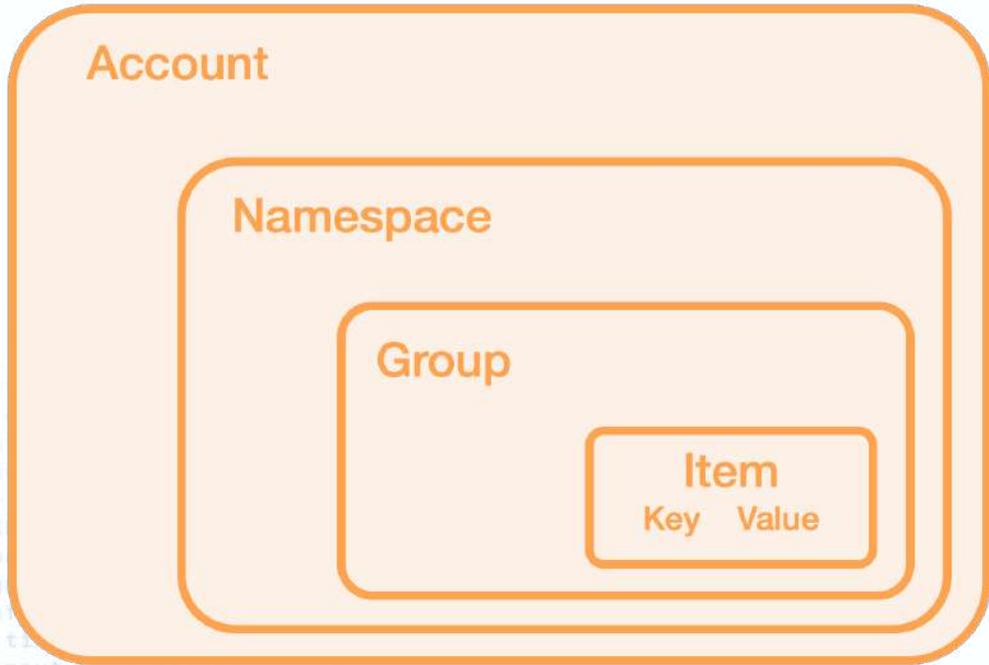
Enable On

 If you haven't created an Identifier yet, use the [EdgeWorkers Management application](#) to create one. When you're done, reload this page to view and select your new Identifier from the list.

Identifier

기존 CDN 구성에 EdgeWorkers 속성 추가

EdgeKV (Key-Value) 데이터베이스



- 재전송 페이지 리스트
- Blacklist Ips
- 개인의 접속 정보 저장
- 상태(state) 정보 저장
- 쇼핑 카트
- 개인화 페이지
- 로그 데이터

Account - Namespace - Group - Item - Key:Value
데이터베이스 모델링 구조

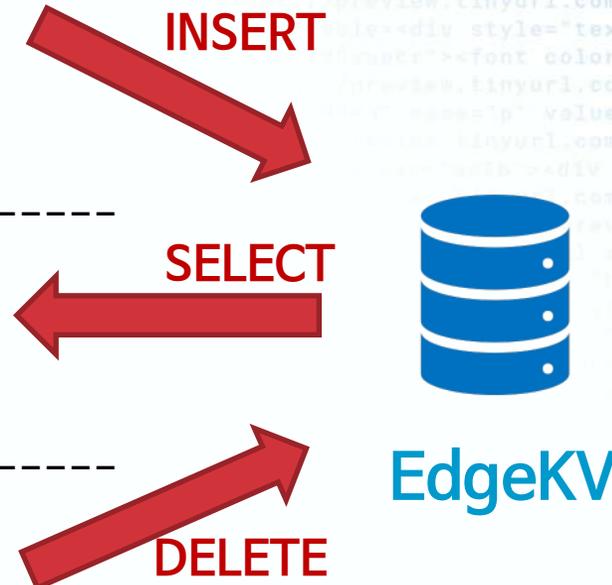
EdgeKV (Key-Value) 데이터베이스

METHOD | ENDPOINT | Data

----- | -----
PUT | /api/v1/namespaces/default/groups/greetings/items/en | "Hello World"
PUT | /api/v1/namespaces/default/groups/greetings/items/fr | "Bonjour le Monde"
PUT | /api/v1/namespaces/default/groups/greetings/items/es | "Hola Mundo"

METHOD | ENDPOINT ----- | -----
GET | /api/v1/namespaces/default/groups/greetings/items/en
GET | /api/v1/namespaces/default/groups/greetings/items/fr
GET | /api/v1/namespaces/default/groups/greetings/items/es

METHOD | ENDPOINT ----- | -----
DELETE | /api/v1/namespaces/default/groups/greetings/items/en



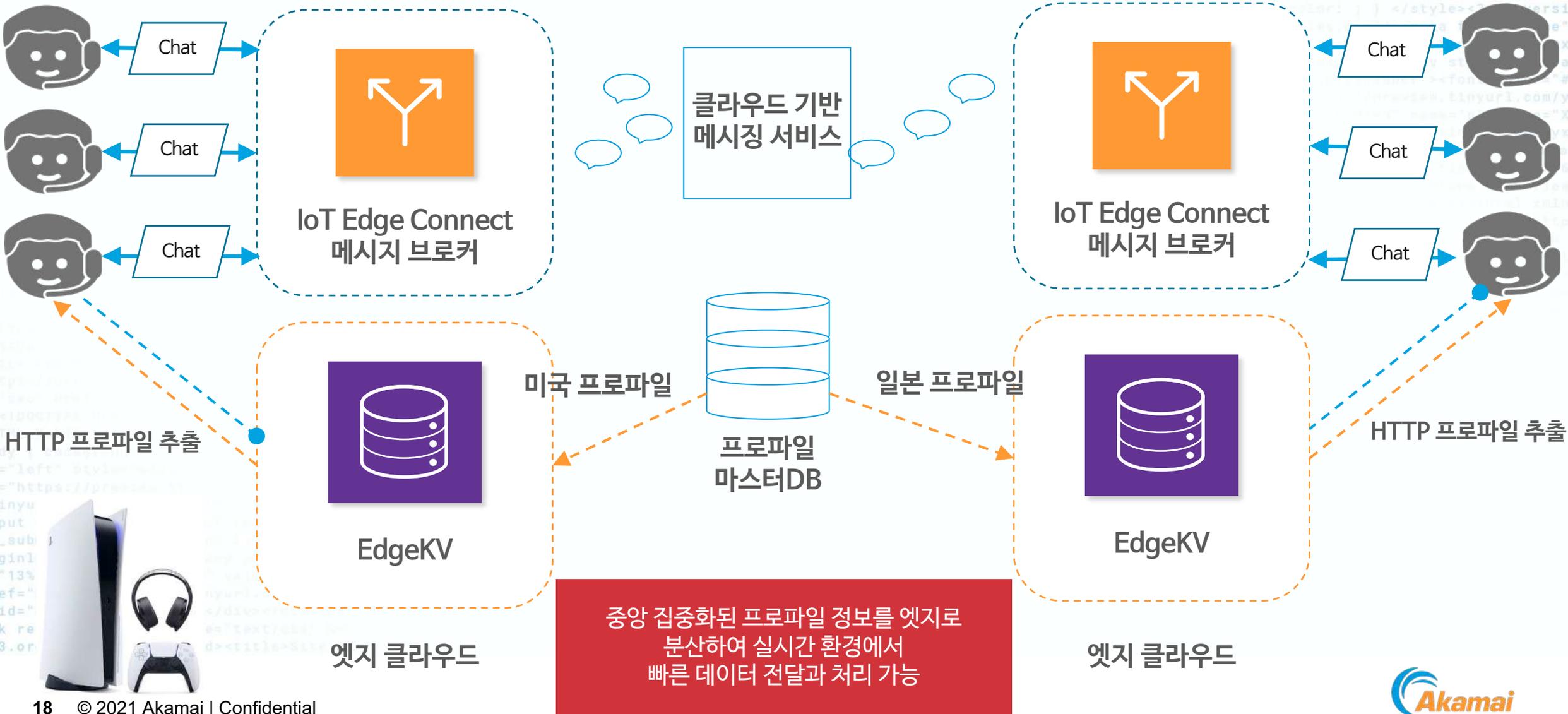
`const edgeKv = new EdgeKV({namespace: "default", group: "greetings"});` **EdgeWorkers 코드에서 호출하여 사용**

`% tar czvf ekv_hello_world.tgz bundle.json edgekv.js edgekv_tokens.js main.js`

`% curl -s -H "Accept-Language: fr" http://mysite.com/helloworld`
`<!DOCTYPE html><html lang="fr" xml:lang="fr"><head><meta charset="UTF-8"></head> <body><H1>Bonjour le Monde</H1></body>`



EdgeKV 데이터베이스 사례



EdgeWorkers 샘플 코드

<https://github.com/akamai/edgeworkers-examples/tree/master/edgeworkers/examples>

akamai / edgeworkers-examples

<> Code Issues 2 Pull requests 2 Actions Security Insights

master edgeworkers-examples / edgeworkers / examples /

joshjohnson Fix bundle.json reference in rollup config (#44)

..	
bundle-third-party-modules	Fix bundle.json reference in rollup config (#44)
control-cache	Refactor layout (#41)
control-origin-routes	Refactor layout (#41)
getting-started/hello-world	Refactor layout (#41)
respond-from-edgeworkers	Refactor layout (#41)
work-with-cookies	Refactor layout (#41)
work-with-origin-issues/origin-overload	Refactor layout (#41)
work-with-redirects	Refactor layout (#41)
work-with-request-properties	Refactor layout (#41)



Akamai

Experience the Edge

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