



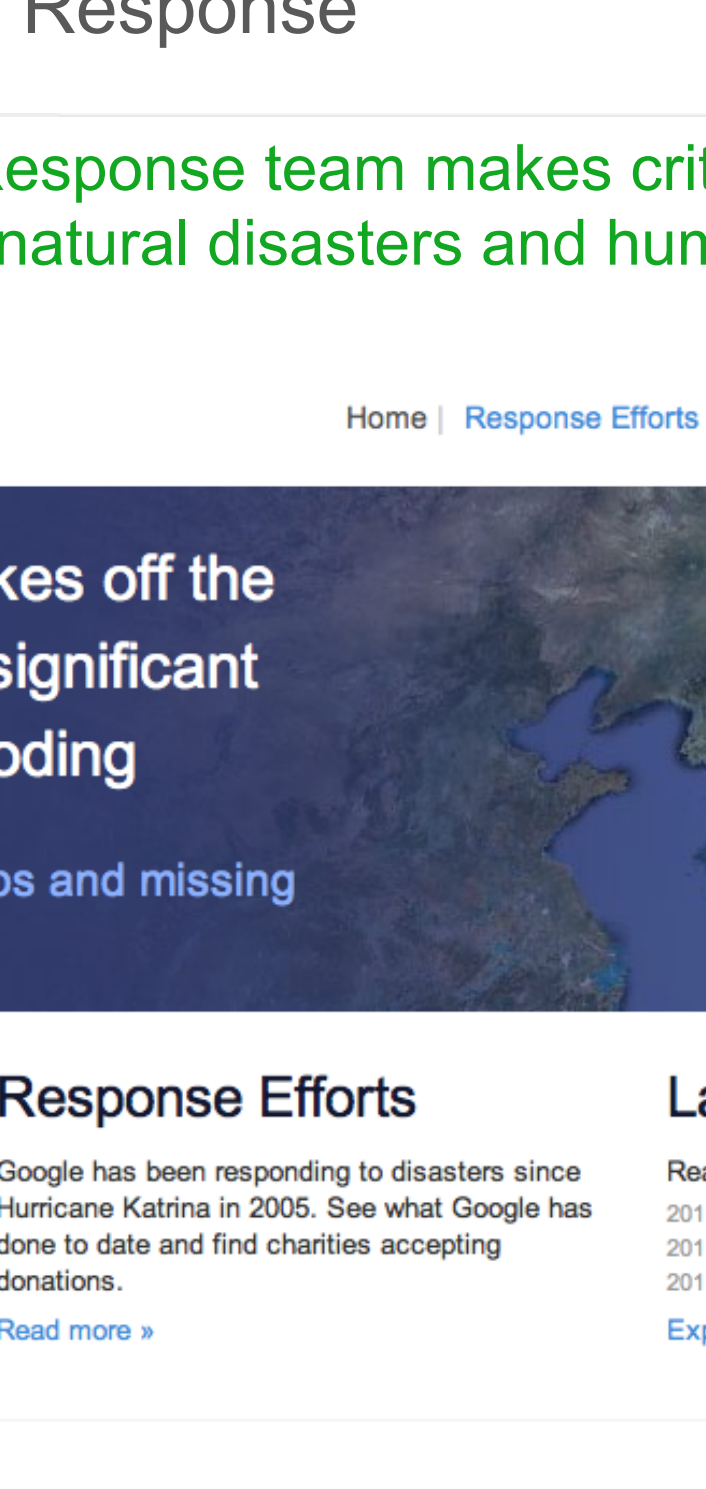
CAP and Google Crisis Response

CAP Implementation Workshop April 6, 2011

Steve Hakusa - Software Engineer
Prem Ramaswami - Product Manager

Google.org Crisis Response

The Google.org Crisis Response team makes critical information more accessible during natural disasters and humanitarian crises.



Massive earthquake strikes off the coast of Japan causing significant damage and tsunami flooding

Find emergency information, maps and missing persons resources »

About Us

Google Crisis Response seeks to make critical information more accessible around natural disasters and humanitarian crises.

[Learn more »](#)

Response Efforts

Google has been responding to disasters since Hurricane Katrina in 2005. See what Google has done to date and find charities accepting donations.

[Read more »](#)

Latest news

Read the latest news on crises around the world.

2011-03-16 [More resources for those affected by...](#)

2011-03-12 [Post-earthquake imagery of Japan](#)

2011-03-12 [Assembling resources following the...](#)

[Explore the news archive »](#)

- Problem statement
- Google's interest in CAP
- Tools for the CAP community

during an emergency
people use google

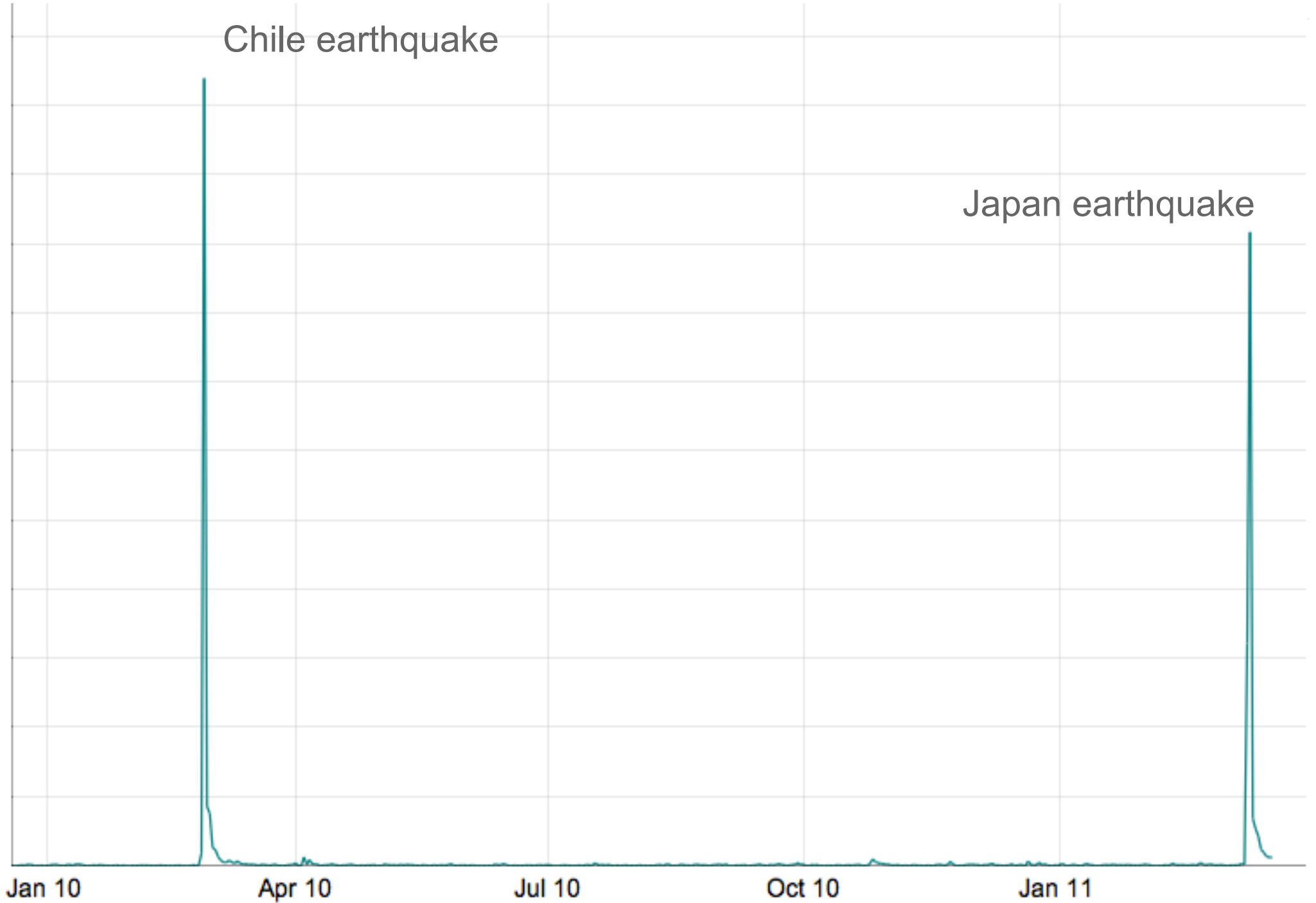


Query: "tsunami," location: Hawaii

google.org

Chile earthquake

Japan earthquake



google has
reach and scale



[Advanced search](#)
[Language tools](#)

Tsunami Alert for New Zealand, the Philippines, Indonesia, Papua New Guinea, Hawaii, and others.
Waves expected over the next few hours, caused by 8.9 earthquake in Japan.

[Advertising Programs](#) [Business Solutions](#) [About Google](#)

© 2011 - [Privacy](#)


March 11, 2011, hours after earthquake

... but we can do better


tsunami near Hawaii

- Hawaii** Ads

Official **Hawaii** Tourism Site
Explore the Islands of Aloha
www.gohawaii.com
- A Pacific Tsunami Museum Inc** ▾ ☆ -
[more info »](#)



130 Kamehameha Avenue, Hilo, HI
(808) 935-0926
13 reviews
"If you want to learn about Hilo's history then this is the perfect museum to ..."
- B Tsunami Hawaii** ▾ ☆ - [more info »](#)




1272 South King Street, Honolulu, HI
(808) 596-0700
★★★★☆ 45 reviews
- C Intl Tsunami Information Center** ▾ ☆ -
[more info »](#)


737 Bishop St # 139, Honolulu, HI
(808) 532-6422
- D Tsunami Electronics** ▾ ☆ - [more info »](#)

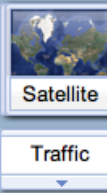
29 Central Avenue, Wailuku, HI
(808) 244-3644
1 review
"seems to me that \$600 for a subwoofer (1400 watts) is just too costly!"
- E Tsunami Data Works LLC** ▾ ☆ - [more info »](#)


1325 Nuuanu Ave # 201, Honolulu, HI
(808) 528-5456
- F Tsunami Tropicals, Ltd.** ▾ ☆ - [more info »](#)



55-691 Kapiko Place, Hawi, HI
(808) 557-0313







50 mi
100 km

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[Hawaii Vacation Packages](#) - www.pleasantolidays.com - Hot deals to Oahu, Maui, Kauai and the Big Island. Learn more today!

March 11, 2011, 5 hours after earthquake

Contributions from dozens of Googlers around the globe

Resources related to the 2011 Japan Crisis

On March 11 at 2:46pm JST a massive 9.0-magnitude earthquake occurred near the northeastern coast of Japan, creating extremely destructive tsunami waves which hit Japan just minutes after the earthquake, and triggering evacuations and warnings across the Pacific Ocean. The earthquake and tsunami have caused extensive and severe damage in Northeastern Japan, leaving thousands of people confirmed dead, injured or missing, and millions more affected by lack of electricity, water and transportation.

This page is being updated continuously to provide the latest information about this crisis, resources for those affected, and ways to contribute to relief efforts in Japan.

Make a donation

[Japanese Red Cross Society](#)

[International Medical Corps](#)

[Unicef](#)

[Save the Children](#)

[Other ways to help](#)



¥ [Donate](#)

Enter amount in JPY Google Checkout

2000 yen is approximately 25 US dollars.

All funds received will be sent to the [Japanese Red Cross Society](#) donation account and will be distributed directly among those affected by the earthquake and tsunami.

Person Finder

Person Finder: 2011 Japan Earthquake

[日本語](#) | [English](#) | [한국어](#) | [中文\(简体\)](#) | [中文\(繁體\)](#) | [Português \(Brasil\)](#) | [español](#) | [Tiếng Việt](#)

What is your situation?

[I'm looking for someone](#)

[I have information about someone](#)

Currently tracking about 395200 records.

短縮 / Short URL : <http://goo.gl/sagas> (携帯対応 / Mobile OK)

[災害に関する情報](#) / [Other Resources](#)

NHK 安否情報も含まます / with data from: NHK

PLEASE NOTE: All data entered will be available to the public and viewable and usable by anyone. Google does not review

Alerts and status

Blackout information

[Google Rolling Blackout Information](#)

We have moved the information about rolling blackout to this new site.

Electric Power Companies (Japanese language)

[Tohoku-Electric Power](#)

[Tokyo-Electric Power \(TEPCO\)](#)

[Hokkaido-Electric Power](#)

[Chubu-Electric Power](#)

Government Agencies

[Japan Meteorological Agency Tsunami Warnings/Advisories](#)

Alerts and status

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Government Agencies

[Japan Meteorological Agency Tsunami Warnings/Advisories](#)

[Nuclear and Industrial Safety Agency](#)

[Pacific Tsunami Warning Center](#)

[Prime Minister of Japan and His Cabinet](#) (Japanese language)

U.S. State Dept. & Embassy Resources

U.S. citizens seeking information can go to [the U.S. Department of State Travel site](#) or call 1-888-407-4747 (toll free) or 1-202-501-4444. For U.S. citizens in Japan seeking up to date information, go to [the U.S. Embassy in Japan site](#).



we can do a LOT more

Deliver accurate, relevant, credible information to the public

- for **all** emergency events affecting life and property
- as **fast** as possible
- **across** many Google products



We need faster adoption of a common standard for distributing alerts across the Web.

- **Trusted sources** of emergency data
- Speaking the same language (**CAP**)
- Sharing data in a **secure, automated** way

CAP for the web

Most of these are obvious, but we want to highlight them because of our needs.

- Make sure CAP is valid
- Make <instructions> clear, succinct, and actionable
- Target <alert>s to a single geographic area
- Use <circle> or <polygon>, or provide references to standard borders
- Use <references> for updates and cancels
- Use of <incidents> in a standard way
- Set a reasonable <expires>
- Use <web>
- Use <parameter>s to extract all meaningful numbers
- Use <resources> for maps or related data

The CAP standard does not specify a distribution method.

We'd like to use something that's

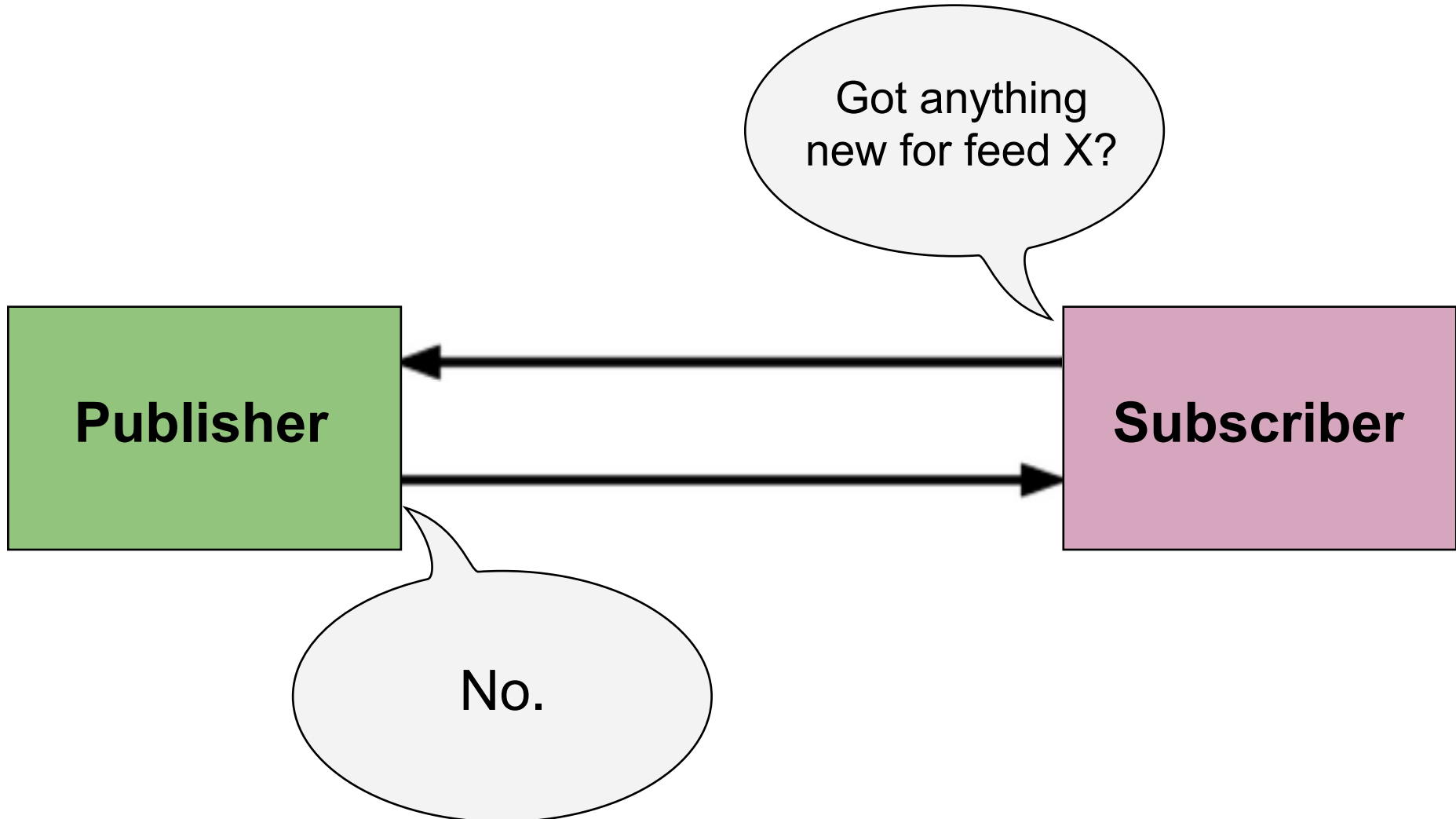
- Simple
 - Prefer feeds over APIs
- Secure
 - HTTPS is a must; CAP is digitally-signed
- Efficient
 - Prefer pushing, support polling
- Standard
 - Prefer Atom, accept RSS, EDXL-DE and raw CAP

- A simple, open, server-to-server publish/subscribe protocol
- Used in many existing Google and non-Google products disseminating updates
 - Google Alerts, YouTube, Blogger, Google Reader, LiveJournal, Tumblr, WordPress, ...

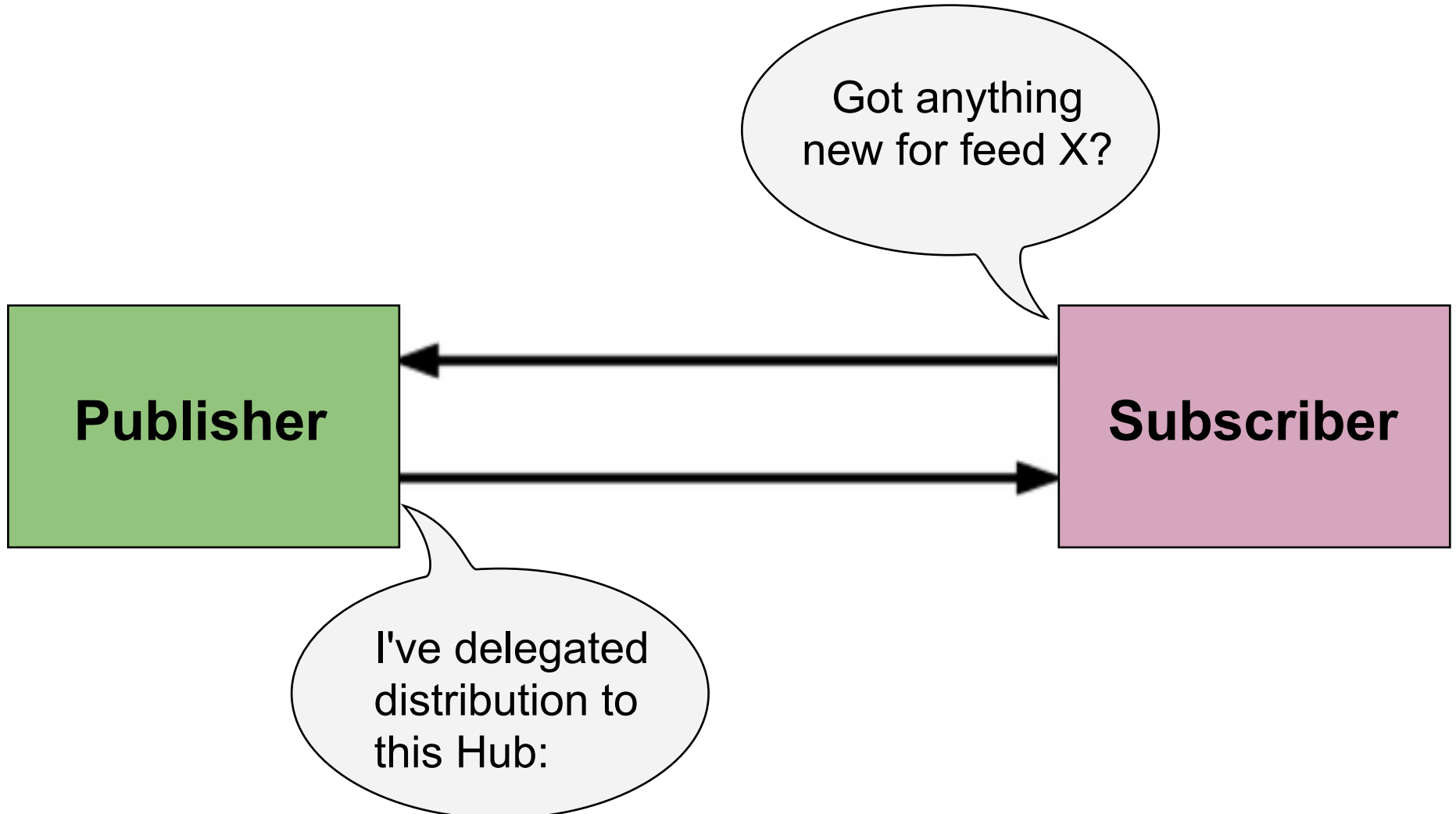
Benefits:

- Simple to integrate
 - All you need is a feed of alerts; no complex APIs
- Secure
 - Supports HTTPS
- Efficient
 - Easy to push alerts to us, but we can also poll
- Open-standard, open-source code
 - Community continues to make improvement
- Bonus: Scalable
 - There can be many other subscribers besides Google
 - All get near-instant notifications
 - Google handles the load; no server capacity issues
 - Duplicate detection, alerts are sent only once

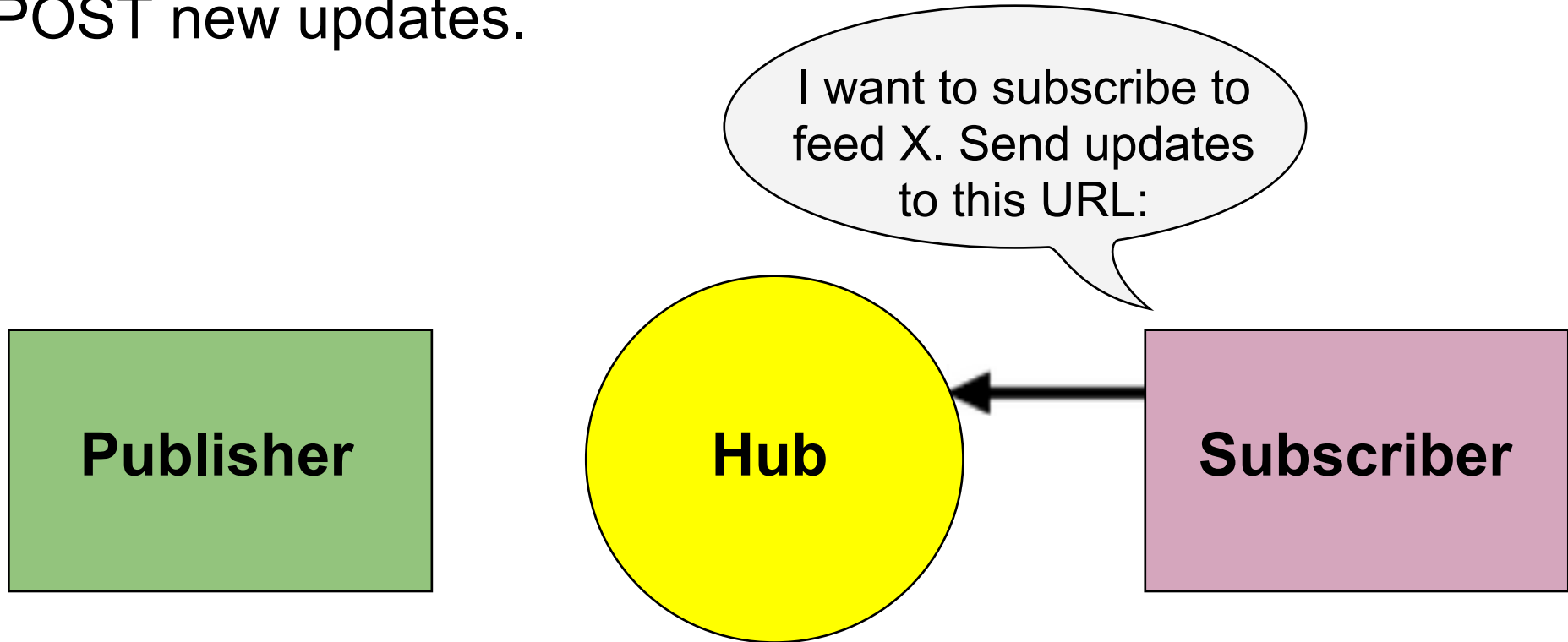
Subscriber continually polls the Publisher's feed. Usually, the Publisher has no updates.



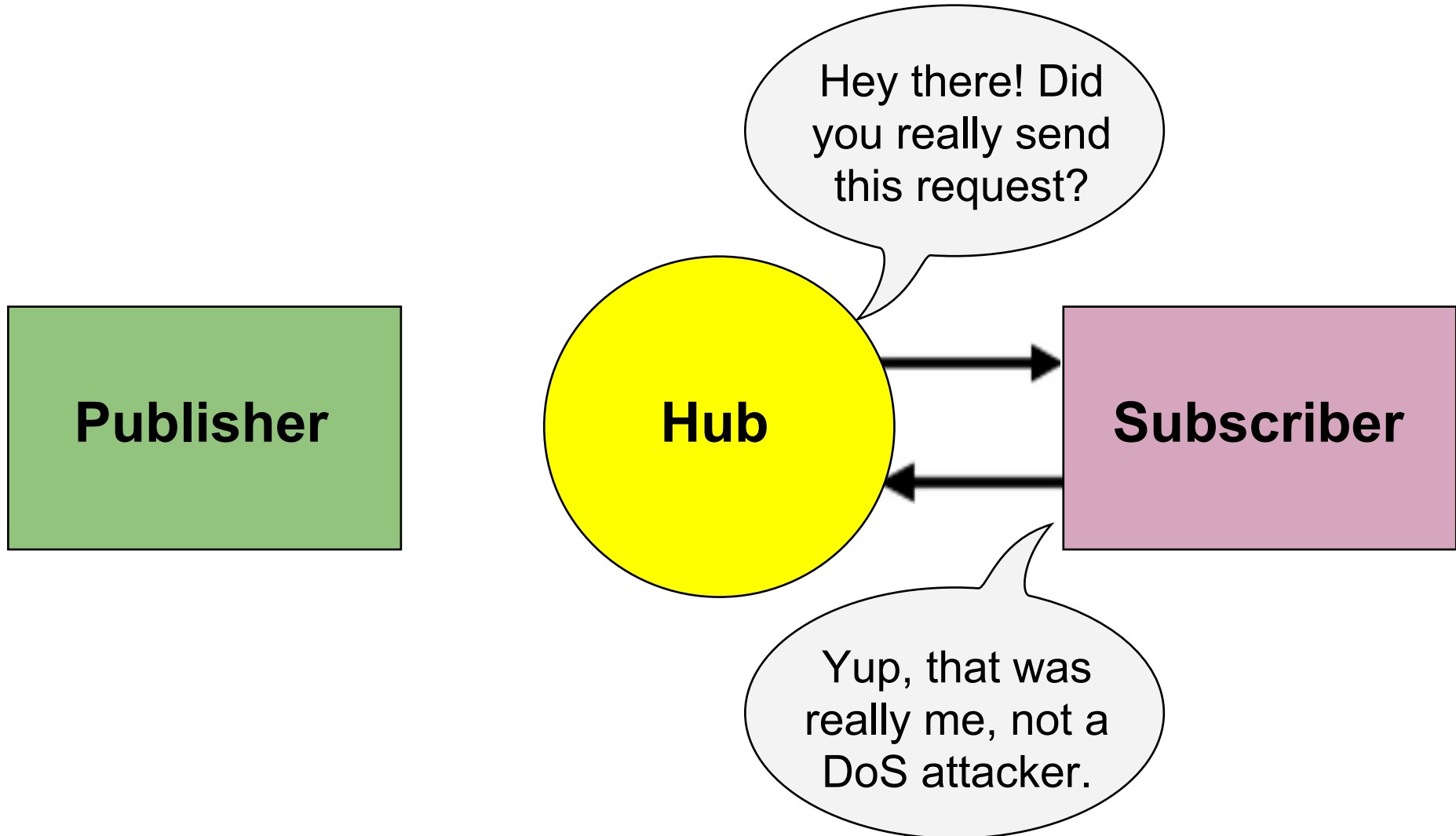
1. Subscriber polls publisher's feed. The feed contains a forward link to the hub.



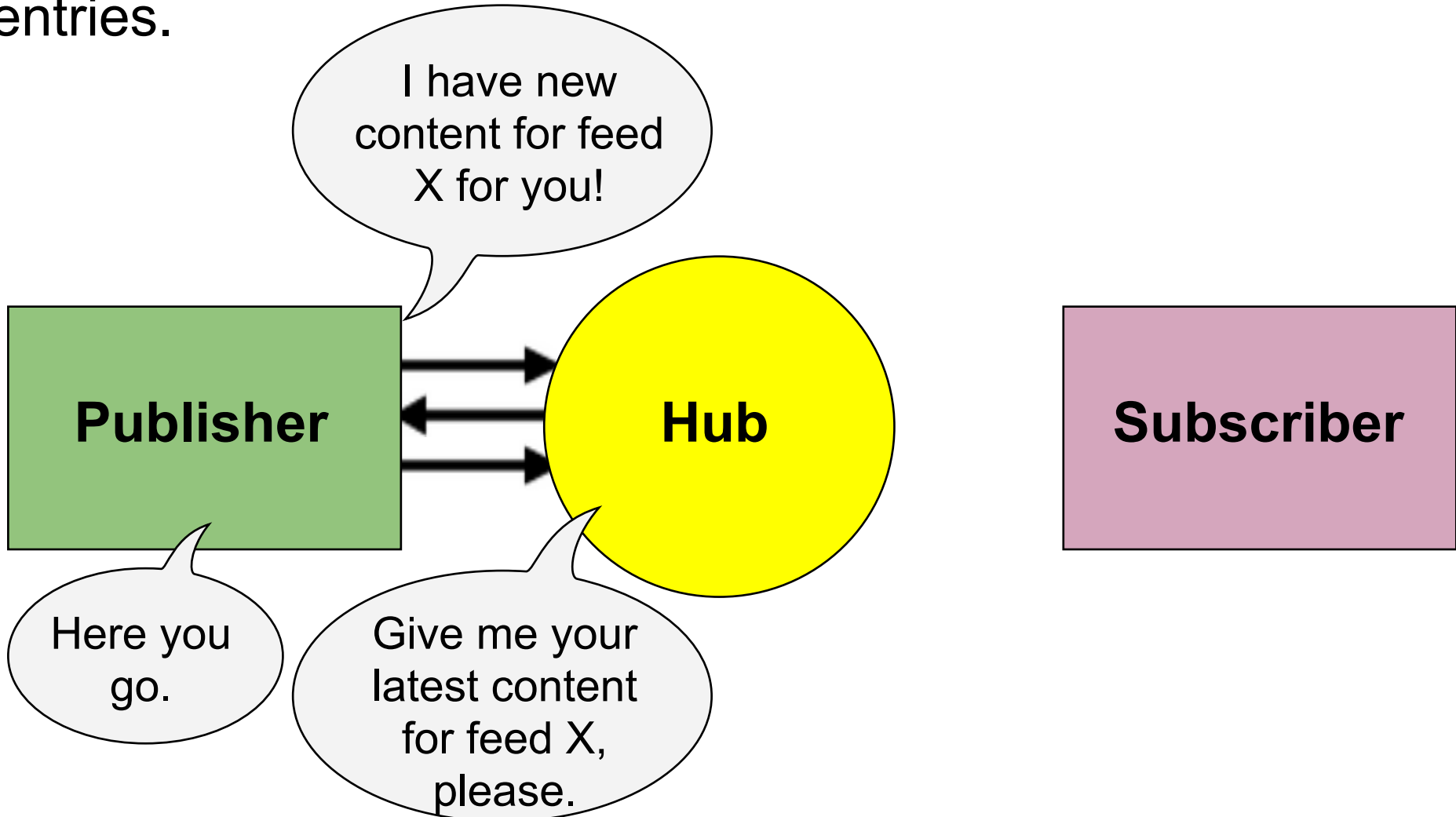
2. Subscriber POSTs subscription request to the Hub. The request contains the callback URL where the Hub should POST new updates.



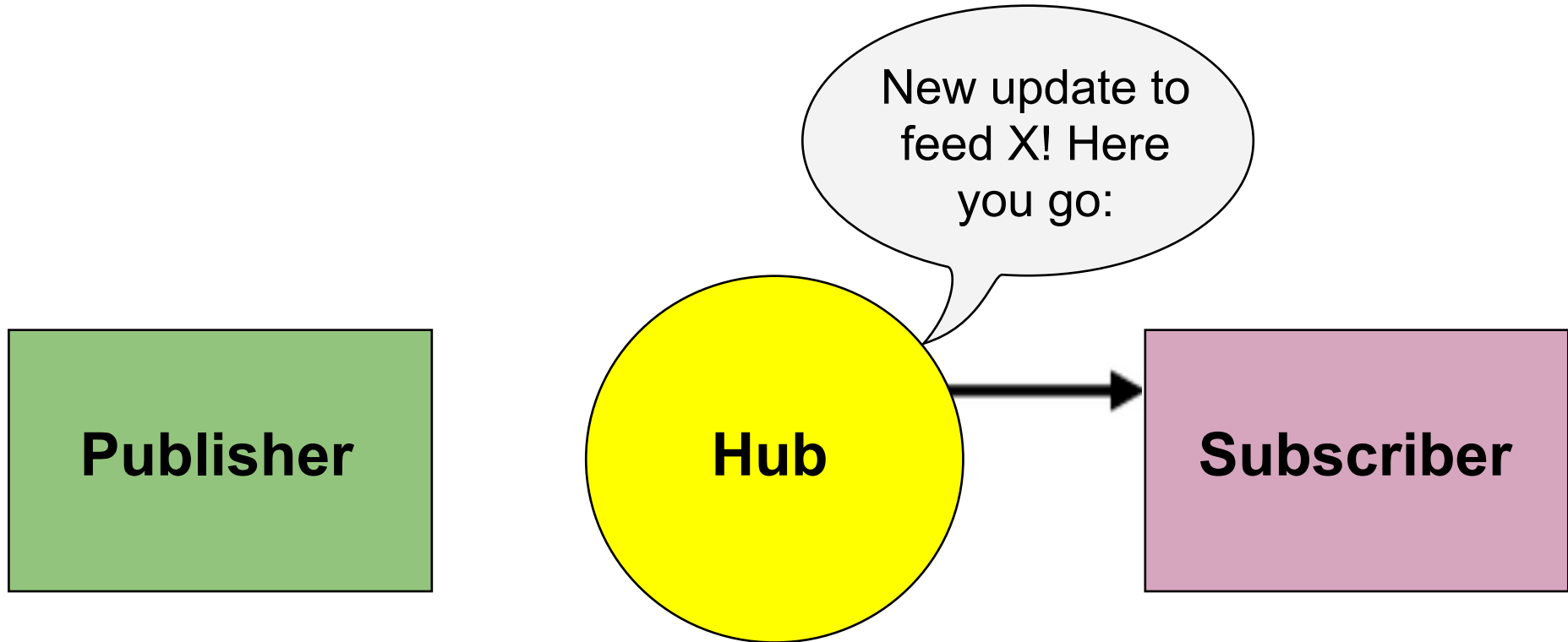
3. Hub POSTs to the callback URL to verify the request was authentic; Subscriber responds with confirmation



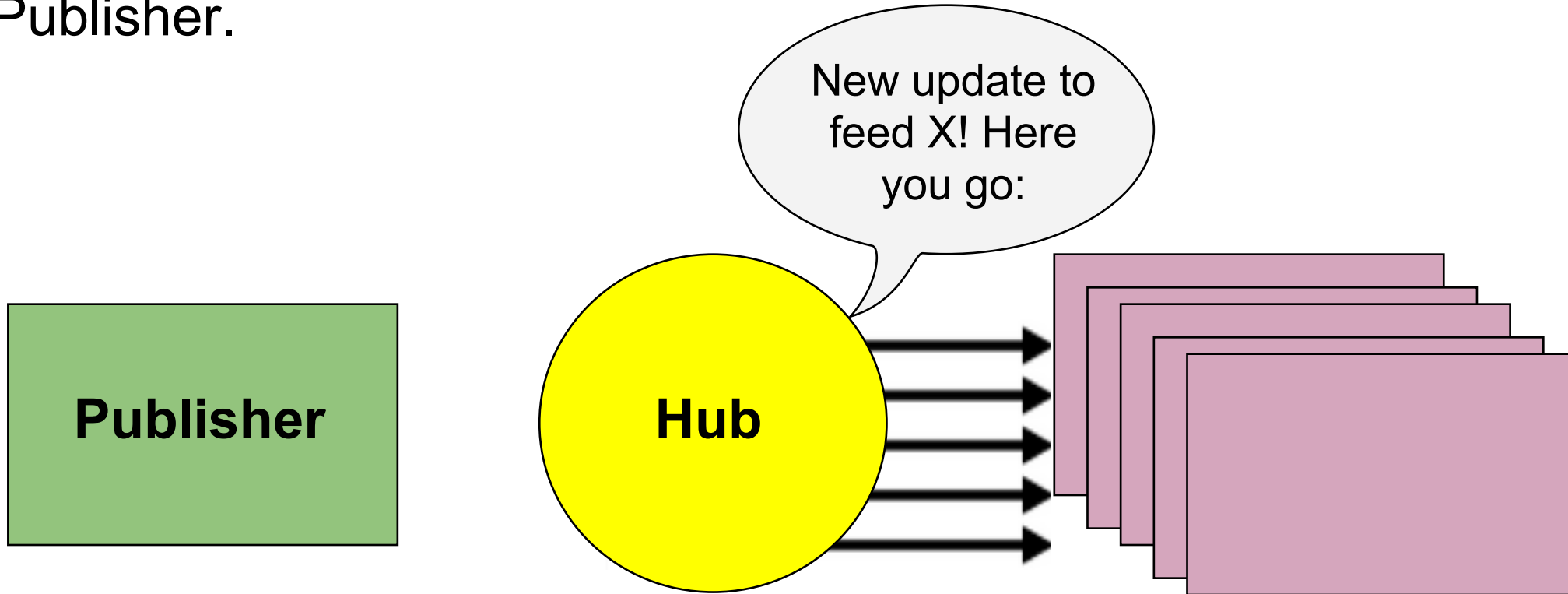
4. Publisher notifies Hub about updates by POSTing feed URLs to the Hub; Hub pulls the feed again to find new entries.



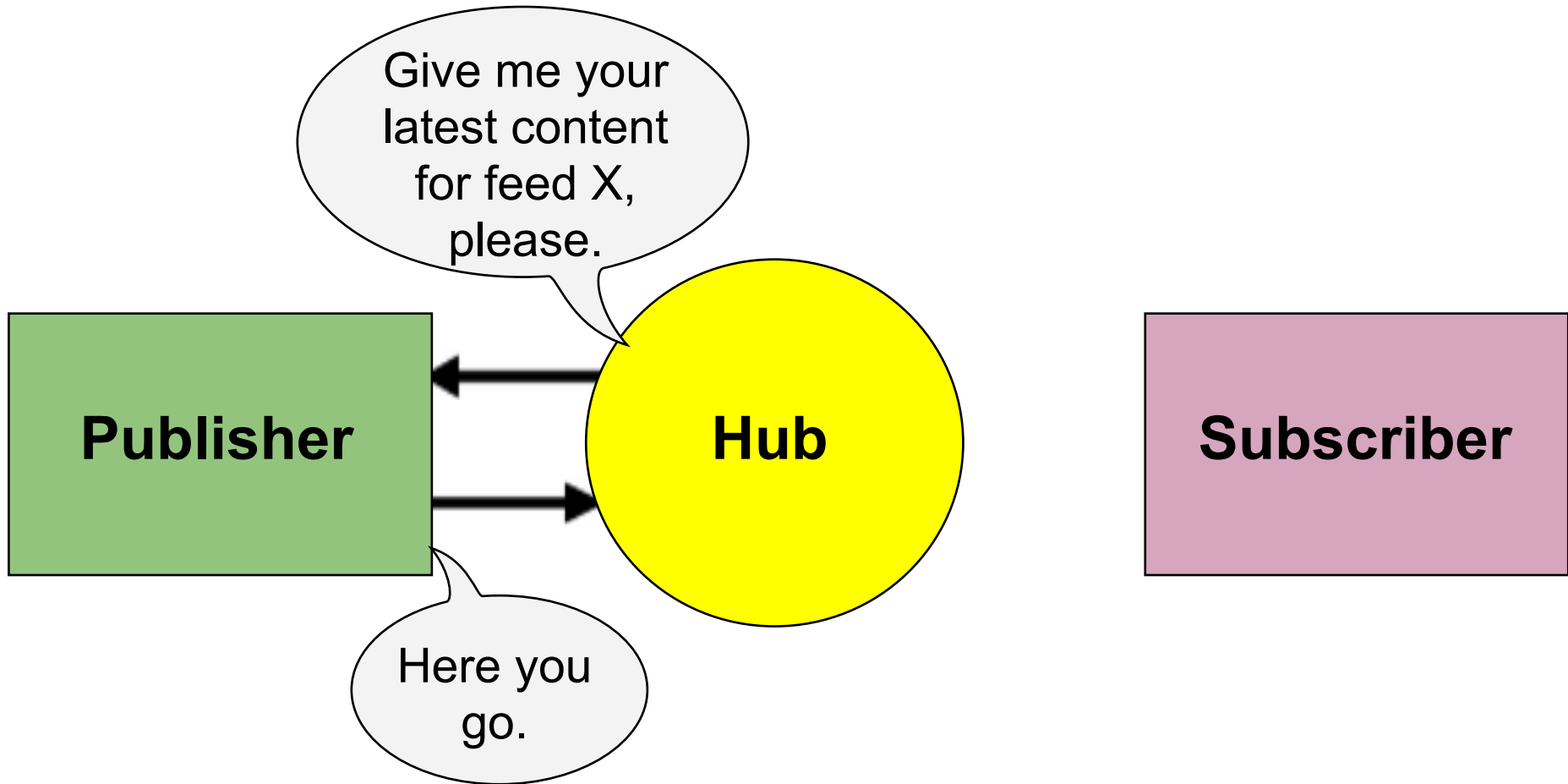
5. When the Hub receives a new update for feed X, it POSTs the update to the Subscribers's callback URL.



6. If feed X has multiple subscribers, the Hub sends updates to all of them. This reduces load on the Publisher.



If the Publisher does not inform the Hub, the Hub will periodically poll the Publisher's feed for new updates.





1. Publish an Atom or RSS feed of CAP alerts

2. Include the following in your feed

```
<link rel="hub" href="http://alert-hub.appspot.com">
```

3. POST your feed URL to the hub when new content is available

4. The hub multicasts updates to subscribers

Code available in PHP, C#, Java, Python, Ruby, Haskell

- <http://code.google.com/p/pubsubhubbub/wiki/PublisherClients>

We have a lot of requests:

- Write CAP well-suited for displaying on the web
- Make access to those alerts secure and verifiable
- Provide a feed using the PubSubHubbub protocol

We want to help provide tools to make this easier

what we've done so far ...

google.org Common Alerting Protocol Validator

The [Common Alerting Protocol](#) validator is a free service that checks the syntax of CAP XML messages and Atom and RSS feeds of CAP messages. It supports CAP v1.0, v1.1 and v1.2.

Input feed

```
<?xml version = "1.0" encoding = "UTF-8"?>
<alert xmlns = "urn:oasis:names:tc:emergency:cap:1.2">
<identifier>KSTO1055887203</identifier>
<sender>KSTO@NWS.NOAA.GOV</sender>
<sent>2003-06-17T14:57:00-07:00</sent>
<status>Actual</status>
<msgType>Alert</msgType>
<scope>Public</scope>
<info>
<category>Met</category>
<event>SEVERE THUNDERSTORM</event>
<responseType>Shelter</responseType>
<urgency>Immediate</urgency>
<severity>Severe</severity>
<certainty>Observed</certainty>
<eventCode>
<valueName>SAME</valueName>
<value>SVR</value>
</eventCode>
<expires>2003-06-17T16:00:00-07:00</expires>
<senderName>NATIONAL WEATHER SERVICE SACRAMENTO CA</senderName>
<headline>SEVERE THUNDERSTORM WARNING</headline>
<description> AT 254 PM PDT...NATIONAL WEATHER SERVICE DOPPLER RADAR IN
THUNDERSTORM OVER SOUTH CENTRAL ALPINE COUNTY...OR ABOUT 18 MILES SO
KIRKWOOD...MOVING
SOUTHWEST AT 5 MPH. HAIL...INTENSE RAIN AND STRONG DAMAGING WINDS ARE
STORM.</description>
```

(Optional) Validate against common CAP profiles:

- [US IPAWS Profile v1.0](#)
- [CAP Canadian Profile v1.0](#)

Validate

Try these examples:

- [CAP 1.2 Severe Thunderstorm Warning](#)
- [CAP 1.2 Homeland Security Advisory](#)
- [CAP 1.1 Earthquake Atom feed](#)
- [CAP 1.1 Amber Alert RSS feed](#)

Result

Valid!

Event: SEVERE THUNDERSTORM
Sent: 2003-06-17T14:57:00-07:00
Expires: 2003-06-17T16:00:00-07:00
Area: EXTREME NORTH CENTRAL TUOLUMNE COUNTY IN CALIFORNIA, EXTREME NORTHEASTERN CALAVERAS COUNTY IN CALIFORNIA, SOUTHWESTERN ALPINE COUNTY IN CALIFORNIA
Web:
Sender: KSTO@NWS.NOAA.GOV
Identifier: KSTO1055887203

File

```
1 <?xml version = "1.0" encoding = "UTF-8"?>
sis:names:tc:emergency:cap:1.2">
887203</identifier>
s.NOAA.GOV</sender>
57:00-07:00</sent>
s>
```

- An easy-to-use, well-tested Java library for parsing and creating messages in the CAP format.
- Support for creating and parsing feeds of CAP messages
- Support for validating messages against common CAP profiles
 - IPAWS v1, Canadian Profile
- A simple web application that validates the correctness of CAP messages

```
public void testEndToEnd() throws Exception {
    // Generate a CAP document
    Alert alert = TestUtil
        .getValidAlertBuilder().build();

    // Write it out to XML
    String xml = new CapXmlBuilder().toXml(alert);

    // Digitally sign it
    String signedXml = XmlSigner
        .newInstanceWithRandomKeyPair().sign(xml);

    // Validate the signature
    assertTrue(new XmlSignatureValidator()
        .isSignatureValid(signedXml, false));

    // Parse it, with validation
    Alert parsedAlert = new CapXmlParser(true)
        .parseFrom(signedXml);

    // Assert lossless
    assertEquals(alert, parsedAlert);
}
```



google.org Alert Hub

Jump to: [How to publish](#) | [How to subscribe](#) | [FAQ](#)

Google.org created Alert Hub to aggregate all data feeds with emergency information in one location. By pushing alerts and other kinds of emergency information here, publishers can make it easy for developers around the world to ingest and distribute relevant data to users.

Alert Hub implements [PubSubHubbub](#), a simple, open, server-to-server publish and subscribe protocol. Publishers send their alert feeds to Alert Hub, and it will push the updates in that feed to subscribers.

This hub is supported and run by [Google.org's Crisis Response team](#) as a free service.

How to publish

You start with an [Atom](#) or [RSS](#) feed of alerts. Don't have Atom or RSS? We're open to other formats. [Ask us.](#)

Every time you issue a new alert, tell the hub. [Code is available](#) in PHP, Java, C#, Python, Perl, Ruby, and more. Don't want to write code? [Ask us.](#) We can periodically poll your feed for new alerts.

You'll also want to include a link in your feed to tell your users that they can subscribe to Alert Hub and get updates pushed to them instead of polling your feed. This reduces traffic to your servers and pushes alerts to your subscribers faster.

```
<link rel="hub" href="http://alert-hub.appspot.com"/>
```

You can view stats on your feed using the [publish page](#).

How to subscribe

You subscribe to Alert Hub by providing 2 URLs:

1. Topic: The URL of the feed to which you'd like to subscribe
2. Callback: A URL on your server to send updates to that feed

Here is an example. Let's say <http://alertpublisher.info> had a feed of alerts at <http://alertpublisher.info/atom>. A subscriber at <http://example.com> wants to subscribe to this feed. He writes some code that uses the PubSubHubbub protocol and exposes it at <http://example.com/pshb>. Then he subscribes by passing

1. Topic: <http://alertpublisher.com/atom>
2. Callback: <http://example.com/pshb>

Alert Hub will ping the callback URL to confirm the subscription, then send every new alert from <http://alertpublisher.info/alertfeed> to that same callback URL.

If you don't want to start from scratch, a number of frameworks and content management systems already support the [PubSubHubbub](#) protocol. It is also available in PHP, Java, C#, Python, Ruby, and more. See [the](#)

<http://alert-hub.appspot.com>

your subscription.

- Google wants to improve access to emergency information from trustworthy, credible sources.
- We want to increase the global adoption of CAP.
- Share your CAP alert feed at alert-hub.appspot.com
- Let us know what else we can do:

google-cap-community@googlegroups.com