CCN Based Disaster Information Service

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CCN Based Disaster Information Service

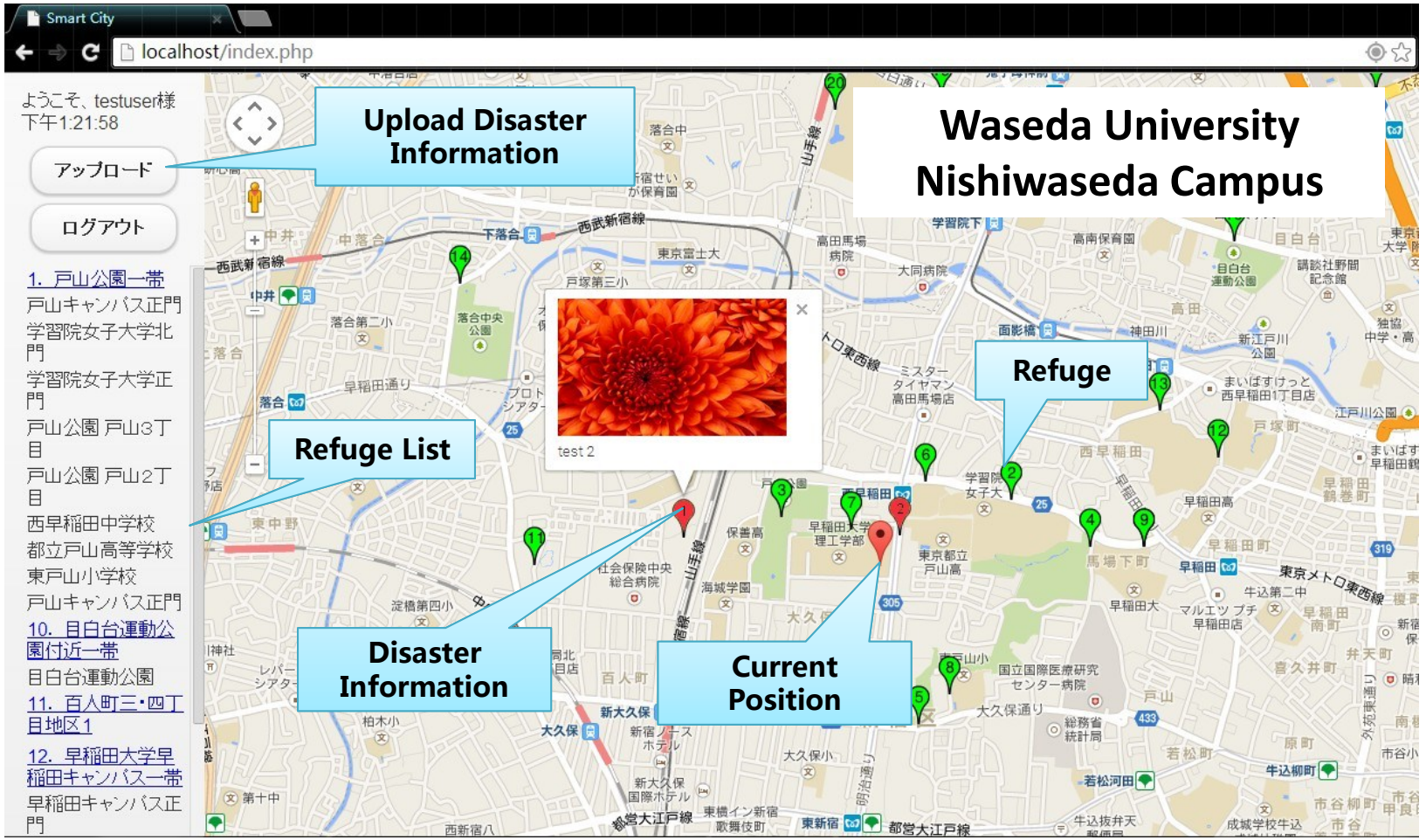
Introduction

- Disaster Information System
- Content-Centric Networking (CCN)

CCN Based Disaster Information Service

Disaster Information System

Web based Disaster Information System.



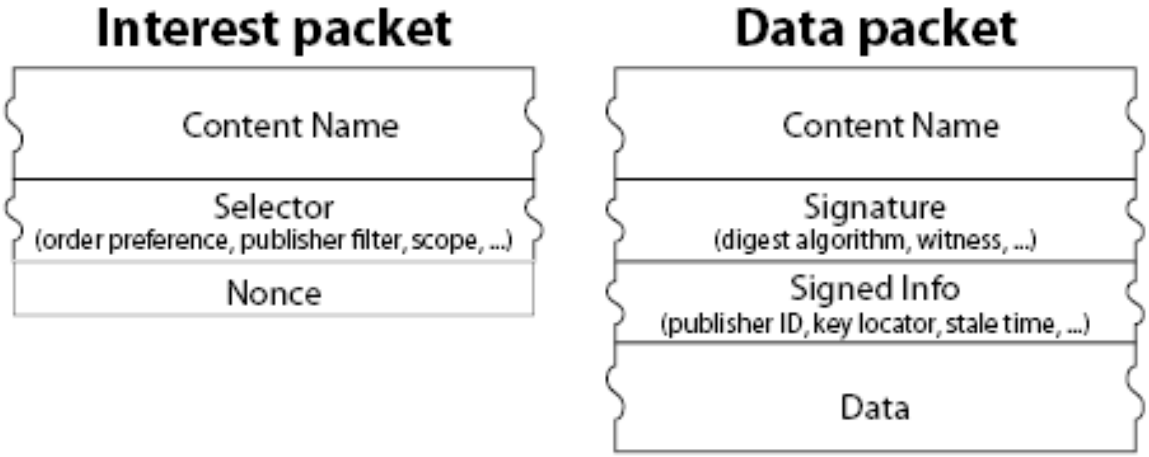
CCN Based Disaster Information Service

Content-Centric Networking

There are two CCN packet types:

Interest: similar to http "get".

Data (Content or Content Object) :similar to http response.



Content-Centric Networking

Basic CCN forwarding

- Consumer ‘broadcasts’ an ‘interest’ over **any** & **all** available communications media:

  get ‘/waseda.jp/satolab/info.mpg’

- Interest identifies a *collection of data*
  all data items whose name has the interest as a prefix.
- Anything that hears the interest and has an element of the collection can respond with that data:

  HereIs ‘/waseda.jp/satolab/info.mpg /s1’ <data>

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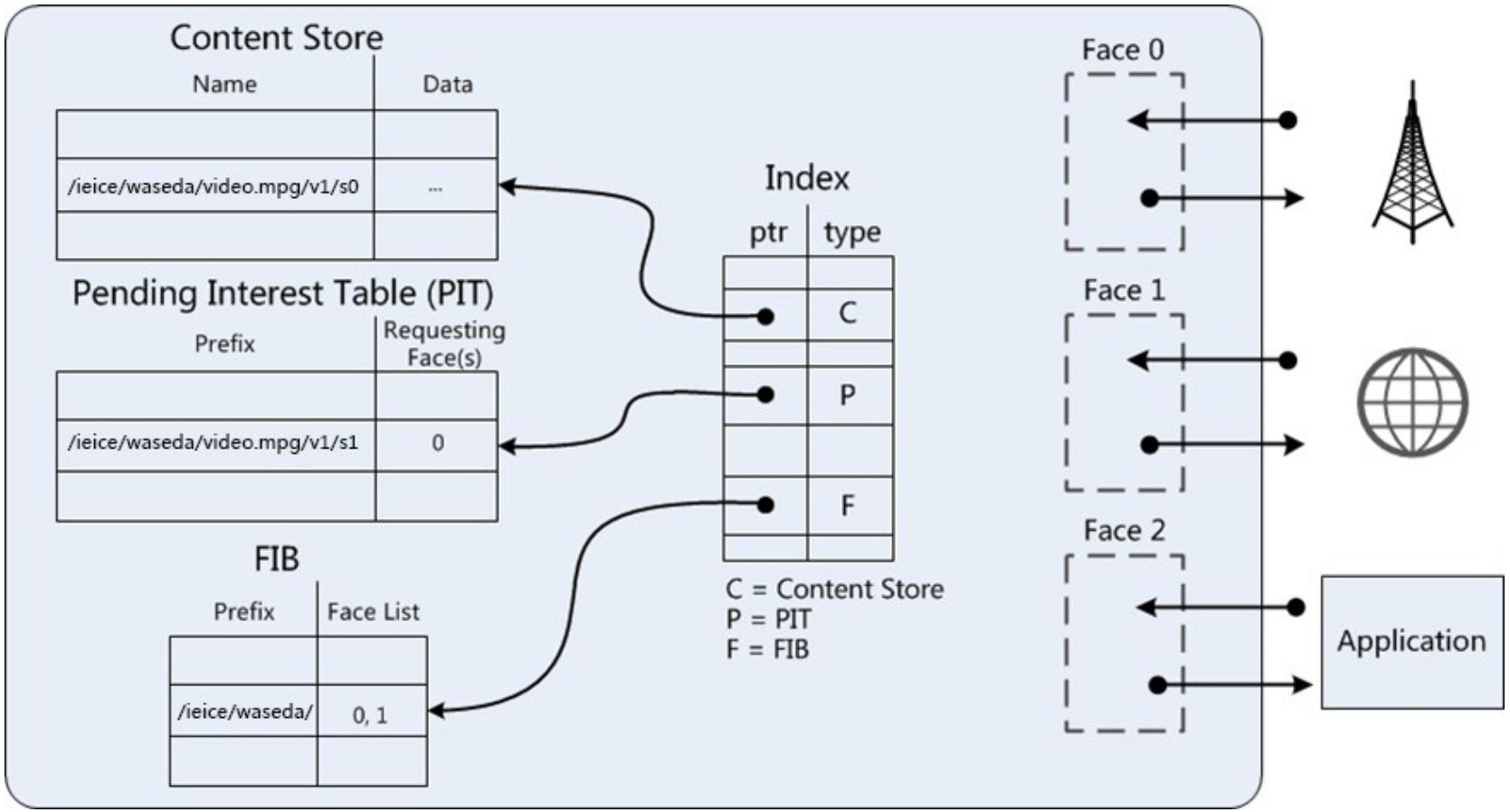
Content-Centric Networking

CCN node model



Quote From “Networking Named Content” by Van Jacobson

CCN Based Disaster Information Publish Service

- Naming Strategy
- Publish / Retrieve Disaster Information

Naming Strategy

Content Identification

- The CCN protocol accomplishes transfers of content by *name*, irrespective of the identities or locations of machines involved.

Names and meaning in CCN

- Like IP, a CCN node imposes no semantics on names.
  Meaning comes from application, institution and global conventions reflected in prefix forwarding rules.
  For example,

  `/waseda.jp/people/wen/presentations/ieice`

  might be the name of a presentation's data and

  `/thisRoom/projector`

  the name of the projector it should display on.
- The former is a globally meaningful name leveraging the DNS global naming structure. The latter is local and context sensitive—it refers to different objects depending on the room you're in.

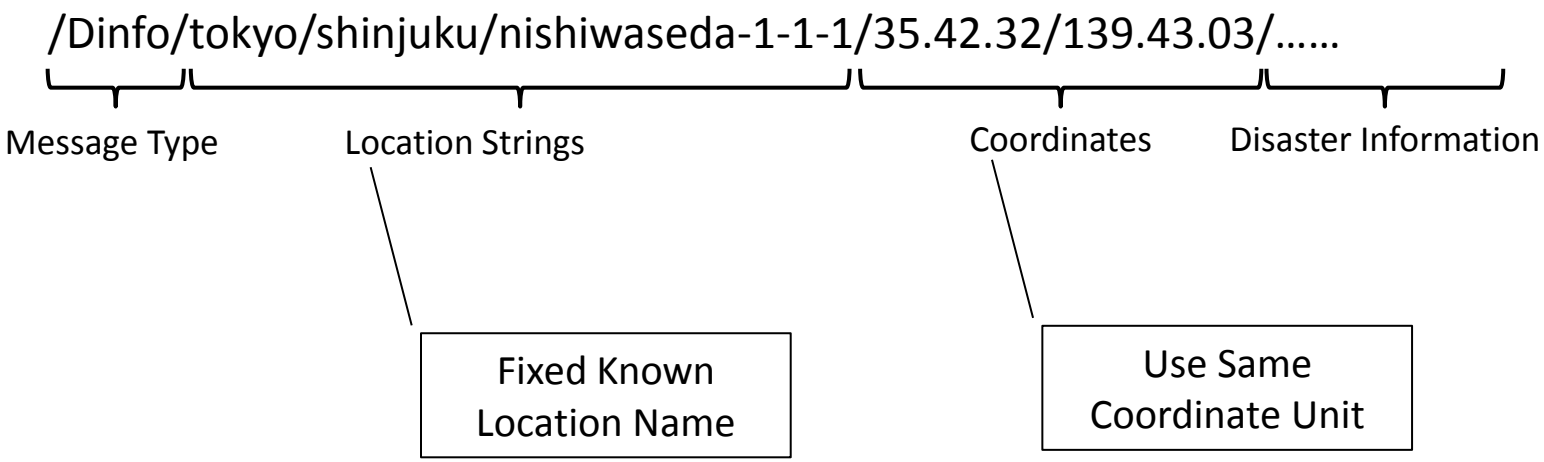
CCN Based Disaster Information Service

Naming Strategy

Naming Strategy in Disaster System

Internally, CCN names are opaque, structured byte strings.

In this system, we present a unified naming strategy for disaster information service. Each terminal could use the same naming strategy to retrieve or publish the disaster information to the nearest CCN node.



CCN Based Disaster Information Service

Publish Disaster Information

- The terminal could publish the disaster information to the nearest CCN node (such as CCN router). Disaster information should consist of picture, text message, video, audio and etc. Disaster information will be packaging in Content Objects. Publishing the disaster information is uploading the Contents to CCN node.

- The naming strategy of publishing disaster information should be organized like following:

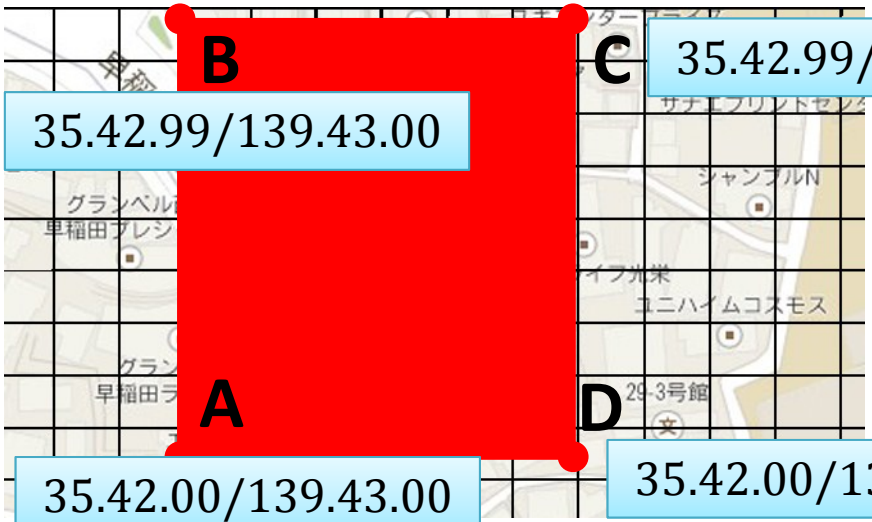
…	Name Prefix	Content
…	/Dinfo/%city%/%district%/%machi%/#latitude/#longitude/	…
	/Dinfo/tokyo/shinjuku/nishiwaseda-1-1-1/35.42.32/139.43.03/	

CCN Based Disaster Information Service

Retrieve Disaster Information

According to unified naming strategy, terminal could send several interests to retrieve the information. The terminal should enumerate the entire possible names within a given coordinate range.

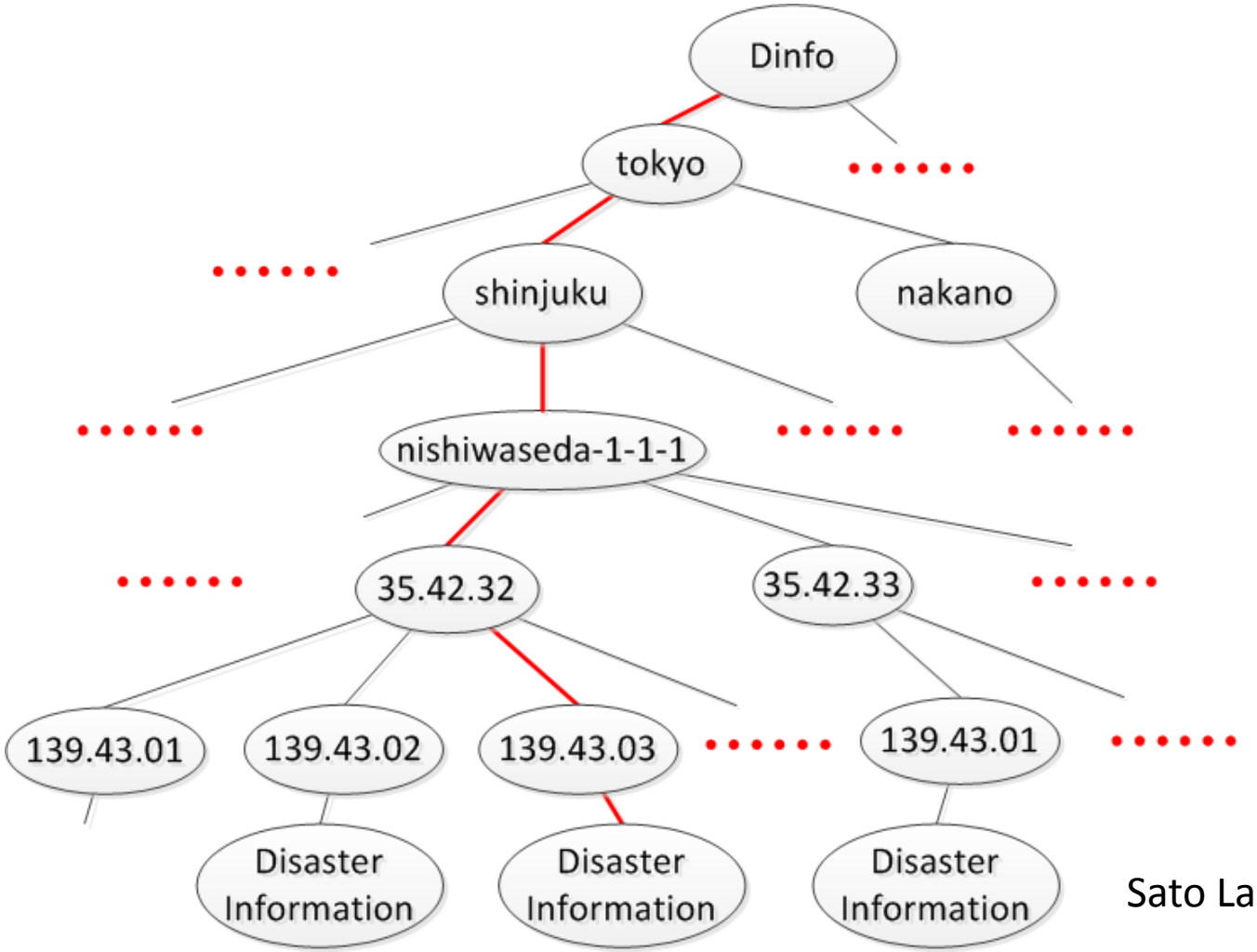
Name Prefix	…
/Dinfo/tokyo/shinjuku/nishiwaseda-1-1-1/$Enumerate_{Coordinates}$	
/Dinfo/%city%/%district%/%machi%/#latitude-range/#longitude-range/	
/Dinfo/tokyo/shinjuku/nishiwaseda-1-1-1/ $\begin{bmatrix} \mathbf{B} & & \mathbf{C} \\ \uparrow & \nearrow & \\ \mathbf{A} & \rightarrow & \mathbf{D} \end{bmatrix}$	…



CCN Based Disaster Information Service

Retrieve Disaster Information

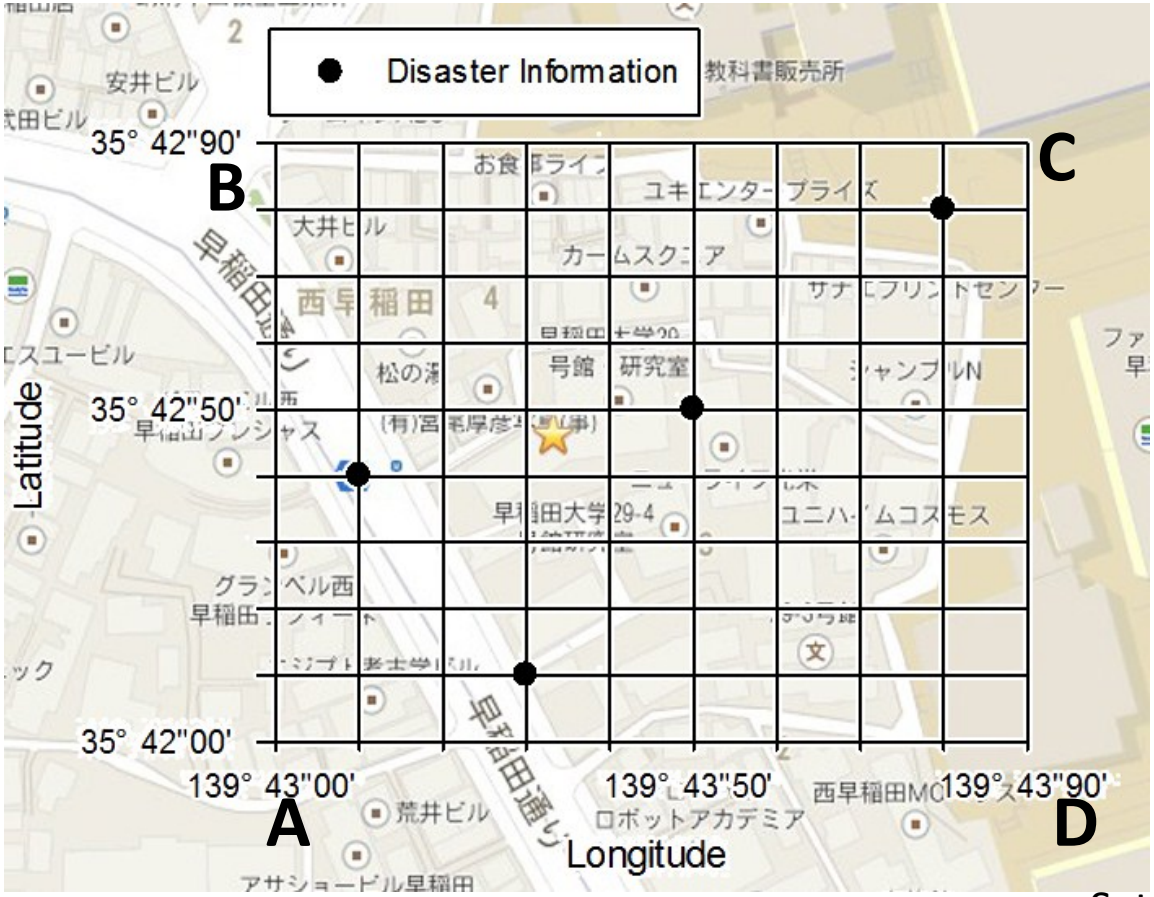
Name prefix traversal for retrieving disaster information.



CCN Based Disaster Information Service

Retrieve Disaster Information

The terminal could receive the matching Contents and plot them on a local map.



Conclusion and Future Work

- The terminal could get the disaster information with the shortest path and utilize disaster information service without accessing fixed central servers.

- Full function version
- Mobile based application

CCN Based Disaster Information Service

Thank you!