

# The Common Alerting Protocol (CAP) and Emergency Data Exchange Language (EDXL) – Application in Early Warning Systems for Natural Hazards

## Warning Message Protocols

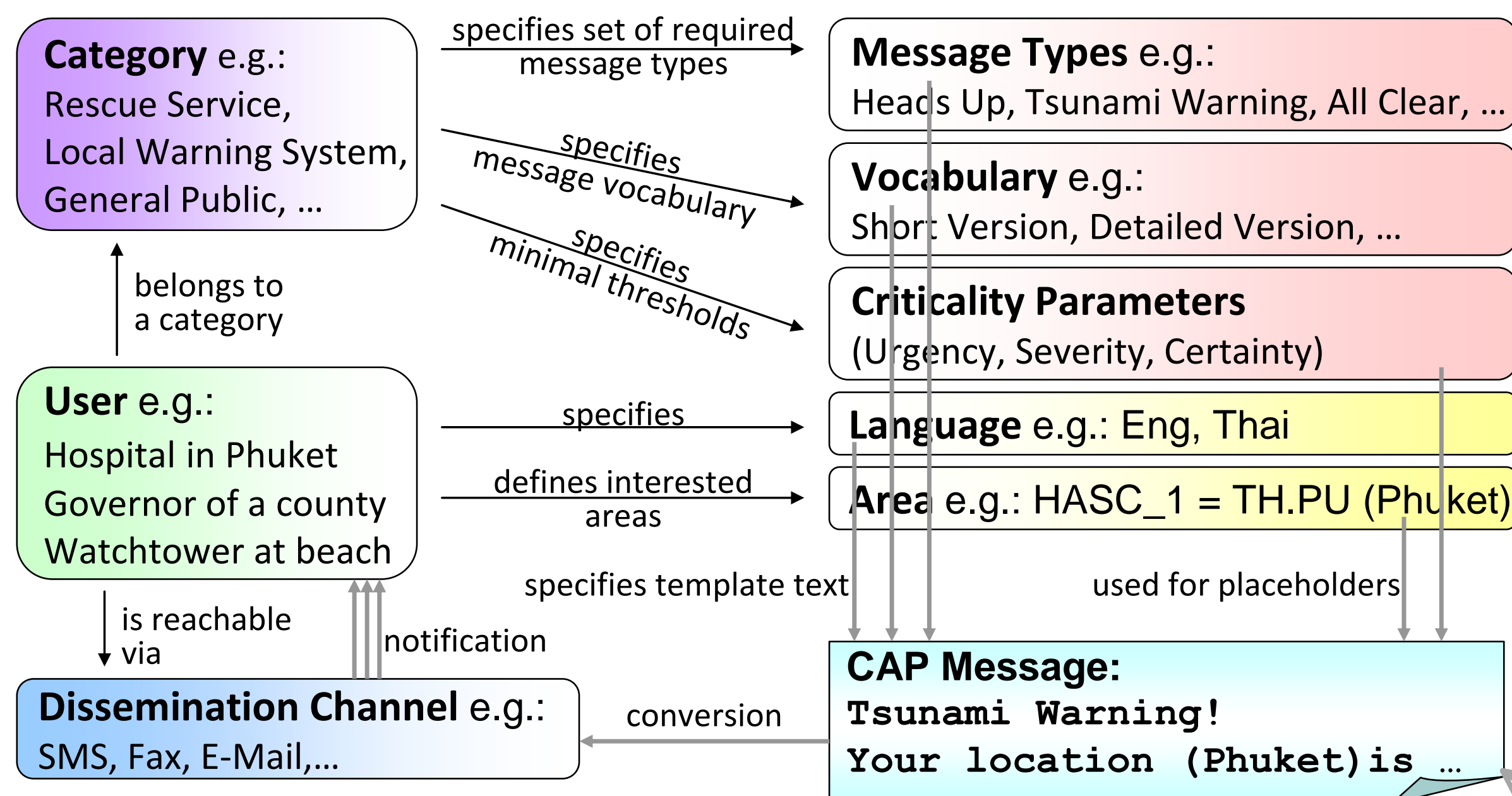
### EDXL-DE

- OASIS Standard of distribution framework for sharing emergency information
- addresses message recipients
- broadcasting with polygons

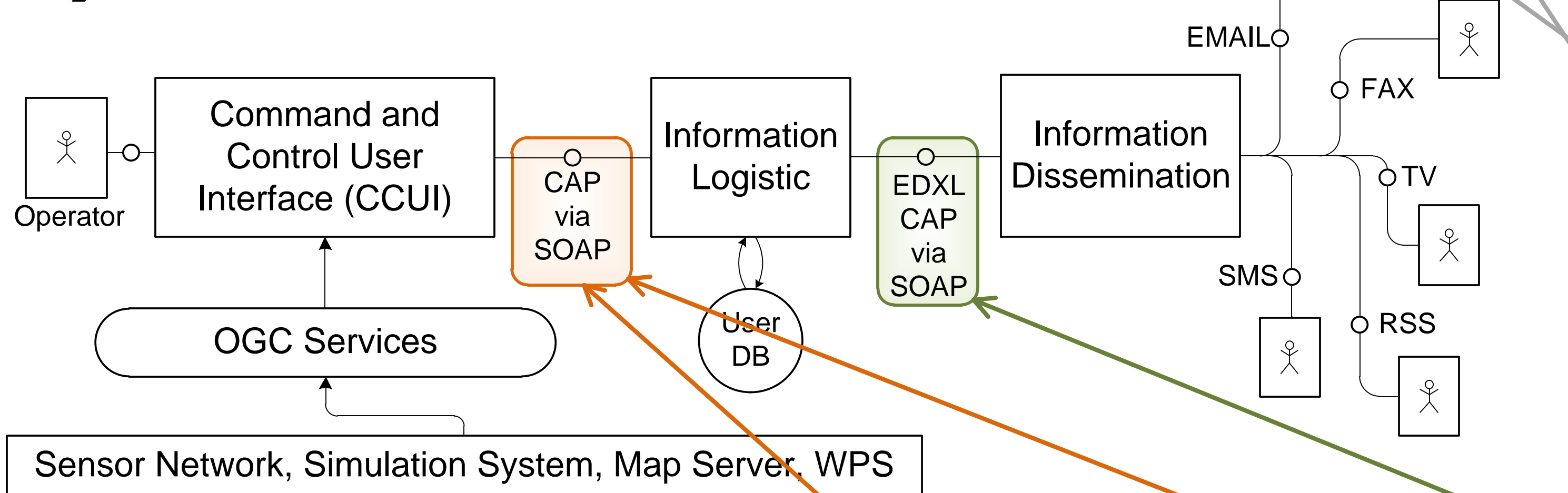
### CAP

- OASIS Standard for exchanging hazard emergency alerts
- addresses affected areas
- hazard values: criticality parameters, time of arrival, ...
- geocodes (HASC, FIPS, SALB, NUTS) for administrative areas
- polygon vertices

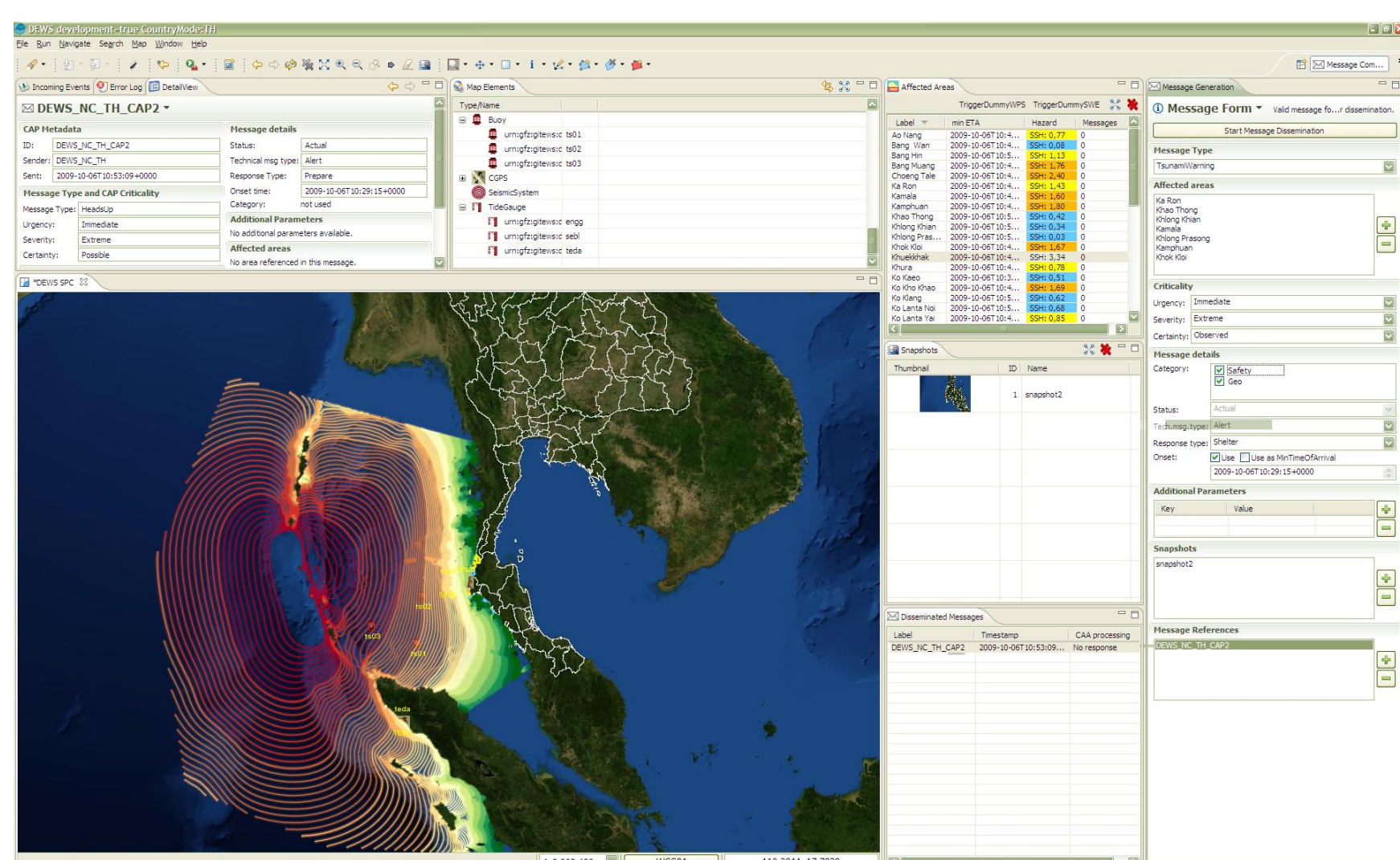
## Information Logistics



## System Architecture



## Affected Areas



Simulation system forecasts: coastal points with estimated time of arrival and inundation height.



Affected Areas: Intersection of simulation result and administrative area polygons.

## DEWS Characteristics

- New generation of open standard based early warning systems
- Reliable hazard detection and effective warning dissemination
- Multi-hazard approach: Application potential for all types of hazards
- Transferable to different geographic areas
- Modular architecture with standardized interfaces
- Upstream: Open integration platform for sensor systems
- Downstream: Information logistics and warning dissemination components
- Open Source wherever possible
- Existing standards wherever possible
- DEWS focuses on downstream by improving information logistics and multi-channel warning dissemination
- Multilingual environment

```
<EDXLDistribution xmlns="urn:oasis:names:tc:emergency:EDXL:DE:1.0">
  <distributionID>
    urn:org:dews_online:centre:NC:TH_CAP1_1</distributionID>
  </distributionID>
  <senderID>urn:org:dews_online:centre:NC:TH</senderID>
  <dateTimeSent>2010-02-03T09:11:48.002+00:00</dateTimeSent>
  <distributionStatus>Actual</distributionStatus>
  <distributionType>Alert</distributionType>
  <combinedConfidentiality>UNCLASSIFIED</combinedConfidentiality>
  <targetArea>
    <polygon>98.34036912,8.20676996 98.34314055,8.208331175 ... </polygon>
  </targetArea>
  <contentObject>
    <contentDescription>CAP message generated by DEWS</contentDescription>
    <incidentID>urn:org:dews_online:centre:NC:TH:0815</incidentID>
    <incidentDescription>Tsunami Warning</incidentDescription>
    <originatorRole>
      <valueListUrn>http://www.dews-online.org/urn/centre</valueListUrn>
      <value>urn:org:dews_online:centre:NC:TH</value>
    </originatorRole>
    <xmlContent>
      <embeddedXMLContent>
        <alert xmlns="urn:oasis:names:tc:emergency:cap:1.1"
          xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
          <identifier>urn:org:dews_online:centre:NC:TH_CAP1_1</identifier>
          <sender>urn:org:dews_online:centre:NC:TH</sender>
          <sent>2010-02-03T09:11:48.002+00:00</sent>
          <status>Actual</status>
          <msgType>Alert</msgType>
          <info>
            <language>eng</language>
            <category>Safety</category>
            <category>Geo</category>
            <event>TsunamiWarning</event>
            <responseType>Shelter</responseType>
            <urgency>Immediate</urgency>
            <severity>Extreme</severity>
            <certainty>Likely</certainty>
            <eventCode>
              <valueName>MessageType</valueName>
              <value>Tsunami Warning</value>
            </eventCode>
            <eventCode>
              <valueName>MessageConsumer</valueName>
              <value>All</value>
            </eventCode>
            <onset>2010-02-03T09:16:12.002+00:00</onset>
            <senderName>urn:org:dews_online:centre:NC:TH</senderName>
            <headline>Tsunami Warning</headline>
            <description>A Tsunami advances. Location: TH.PG.TT.Khok Kloi;
              estimated time of arrival = 2010-02-03T09:16:12+0000;
              max inundation height = 10.5406</description>
            <instruction>Seek shelter immediately!</instruction>
            <area>
              <areaDesc>Khok Kloi</areaDesc>
              <polygon>98.34036912686997,8.20676996782504 ... </polygon>
              <geocode>
                <valueName>FIPS_1</valueName>
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              </geocode>
              <geocode>
                <valueName>HASC_3</valueName>
                <value>TH.PG.TT.Khok Kloi</value>
              </geocode>
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                <value>Thailand</value>
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                <value>Takua Thung</value>
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            </parameter>
            <parameter>
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            </parameter>
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        </alert>
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  </contentObject>
</EDXLDistribution>
```