Effective Public Warnings and the Common Alerting Protocol (CAP)

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  <msg_status>Actual</msg_status>
  <msg_scope>Public</msg_scope>
   <msg_type>Alert</msg_type>
     <|anguage>en-US</|anguage>
      <event_cat>Security
   <info>
      <event_type>Homeland Securit!
      <urgency>Forecast</urgency>
       <severity>Severe</severity>
       <certainty>High</certaint/
       <info_url>http://www.dh<
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O • Outline

 The Challenges of Effective Public Warning

The Common Alerting Protocol
Discussion
The Road Ahead

• Goals of Public Warning

Save lives Avoid losses Reduce fear The measure of warnings are the actions and attitudes that result.

• Effective Warning Systems

Reach everyone who is at risk, wherever, whenever Don't alarm people unnecessarily Easy to use Reliable and secure Deliver effective warning messages

Effective Warning Messages

Accurate and specific Understandable in terms of: Constant of the second seco O Prior knowledge and experience O Timeframe and instructions Action-oriented

• There is no "magic bullet"

No single system or technology can solve the public warning problem alone:

• Need for reliability

• Need for reach

O Need for corroboration

• Corroboration

People don't act on the first warning signal Instead, they become vigilant and look for confirmation When convinced it isn't a false alarm, then they transform information into action

• • Challenges

Many different warning systems Different capabilities, different procedures Social diversity - languages, needs Detecting patterns in activity Applying best practices

New Opportunities

Computerized warning systems (most modern ones!) Internet and other data networks Encryption and digital signatures Extensible Markup Language (XML) and Web services

• An XML Message

<alert>

<identifier>43b08071-3727</identifier> <sender>hsas@dhs.gov</sender> <sent>2003-04-02T14:39:01-05:00</sent> <status>Actual</status> <scope>Public</scope> <type>Alert</type> <info> <language>en-US</language> <category>Security</category> <event>Homeland Security Advisory System</event> <urgency>Immediate</urgency> <severity>Severe</severity> <certainty>Likely</certainty> <from>U.S. Federal Government, Department of Homeland Security</from> <web>http://www.dhs.gov/dhspublic/display?theme=29</web> <image>http://www.dhs.gov/dhspublic/getAdvisoryImage</image> <parameter>HSAS=orange</parameter> <area> <areaDesc>U.S. nationwide</areaDesc> </area> </info>

</alert>

• An XML Message

<alert>

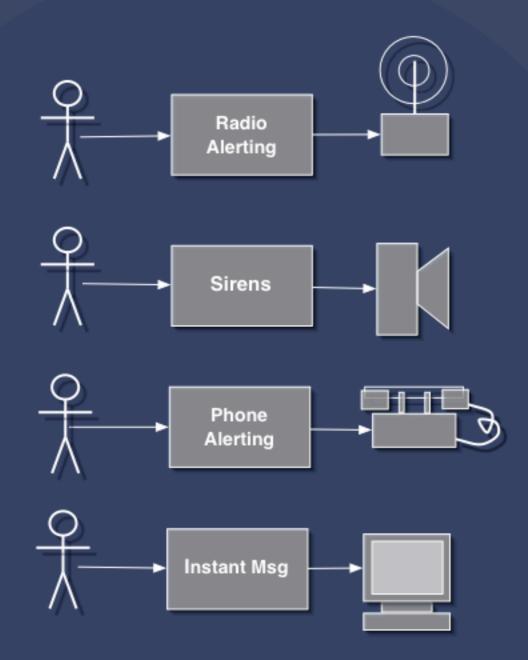
<identifier>43b08071-3727</identifier> <sender>hsas@dhs.gov</sender> <sent>2003-04-02T14:39:01-05:00</sent> <status>Actual</status> <scope>Public</scope> <type>Alert</type> <info> <language>en-US</language> <category>Security</category> <event>Homeland Security Advisory System</event> <urgency>Immediate</urgency> <severity>Severe</severity> <certainty>Likely</certainty> <from>U.S. Federal Government, Department of Homeland Security</from> <web>http://www.dhs.gov/dhspublic/display?theme=29</web> <image>http://www.dhs.gov/dhspublic/getAdvisoryImage</image> <parameter>HSAS=orange</parameter> <area> <areaDesc>U.S. nationwide</areaDesc>

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The Common Alerting Protocol

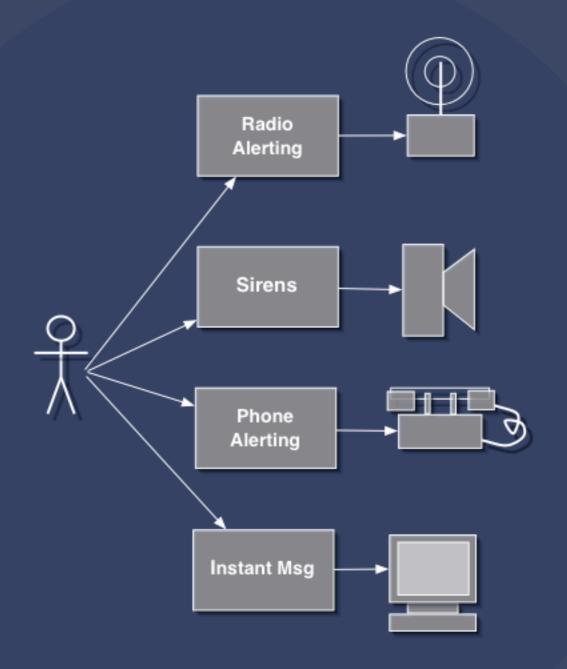
An open, non-proprietary standard All-hazard warning exchange and coordination Developed by emergency managers and technologists worldwide

O Historically...



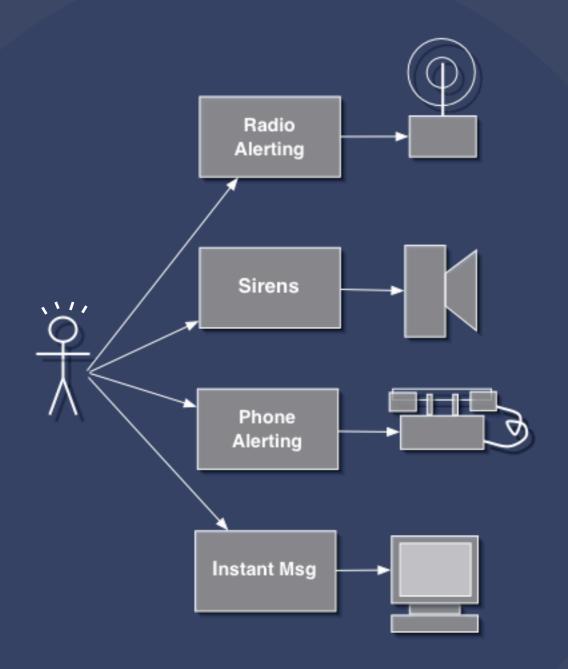
Multiple systems Multiple purposes Multiple operators

O Today's reality...



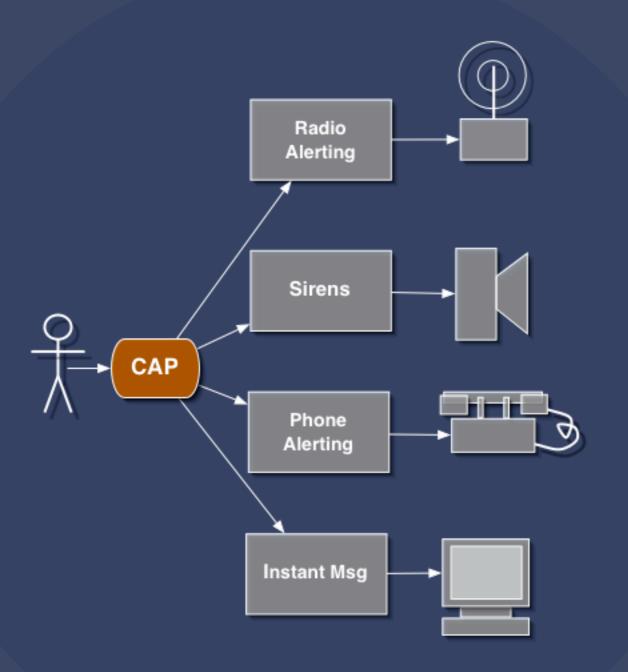
One operator has to activate multiple systems at once to warn effectively

O Today's reality...



One operator has to activate multiple systems at once to warn effectively

O Dising CAP...



One activation triggers multiple systems Consistent, complete messages

Open Standards

Available to all users and systems No royalties or restrictions Adaptation and enhancements allowed so long as result also remains open Copyright used to ensure openness

Effective Disaster Warnings

Report by the Wanning Group on Suburn I Disarter Information Systems Subcommittee on National Disarter Reduction National Science and Techniferg Council Committee on Environment and National Researces National Science and Technology Council releases its "Red Book" report on "Effective Disaster Warnings"

"A standard method should be developed to collect and relay instantaneously and automatically all types of hazard warnings and reports locally, regionally and nationally for input into a wide variety of dissemination systems."

"Effective Disaster Warnings" Working Group on Natural Disaster Information Systems Subcommittee on Natural Disaster Reduction Committee on Environment and Natural Resources National Science and Technology Council November 2000

Formation of:
Partnership for Public Warning
International CAP Ad-Hoc Working Group

Draft CAP Format



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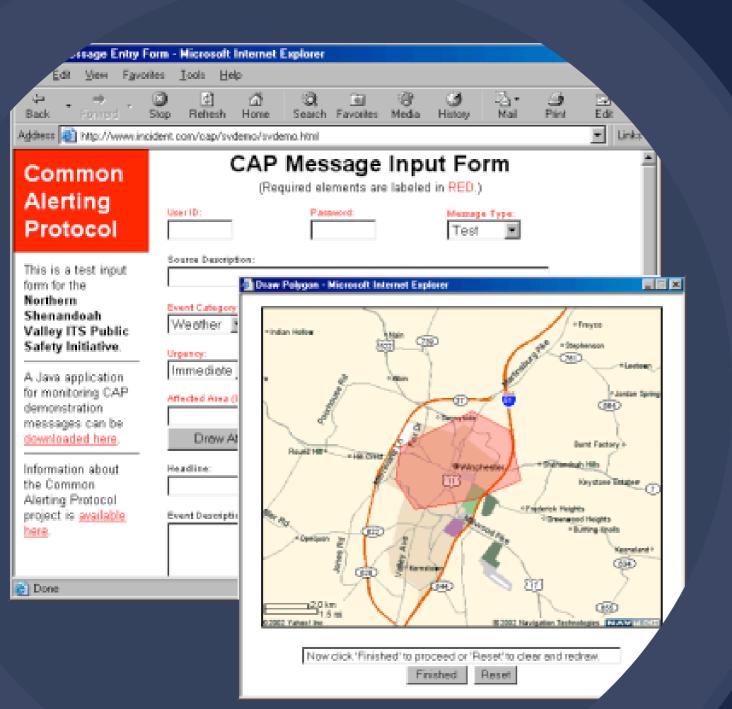
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Draft CAP Format

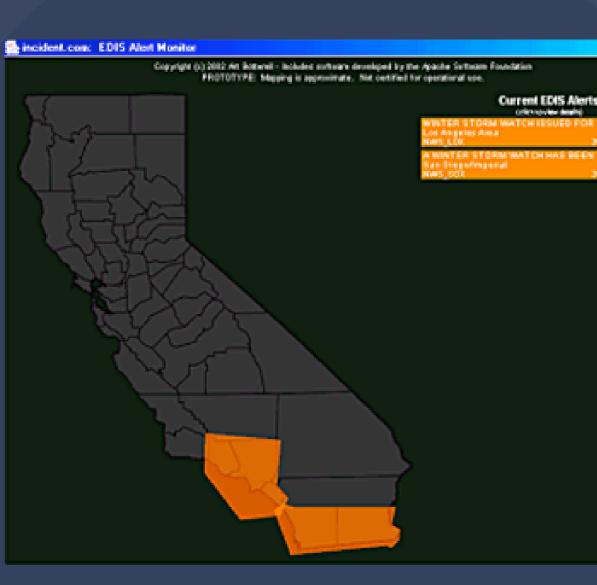
Prototype Applications



Draft CAP Format

Prototype Applications

Virginia Field Trials (ComCARE Alliance)





Prototype Applications

Virginia Field Trials (ComCARE Alliance)

California Field Trial (California EDIS)

 OASIS standards organization forms "Emergency Management XML Technical Committee"

EM TC selects CAP as its first standards-track project

(Today!) CAP draft released for public review and comment



Alert Block - information about this message which may contain...

Info Block(s) - information about the threat which may contain...

 Area Block(s) - information about the affected area(s)

As of draft version 0.8) As of draft version 0.8)

alert

Message ID Sender ID Date/Time Sent Alert Status Alert Type Password Operator ID Alert Scope Restriction Address Handling Code Note Reference ID Incident ID

As of draft version 0.8) As of draft version 0.8

<u>alert</u>

Message ID Sender ID Date/Time Sent Alert Status Alert Type Password Operator ID Alert Scope Restriction Address Handling Code Note Reference ID Incident ID



Event Category Event Type Urgency Severity Certainty Language Audience Target Code Date/Time Effective Date/Time Onset Date/Time Expires Sender Name Headline **Event Description** Instructions Information URL Image URL Audio URL Contact Info **Parameters**

(As of draft version 0.8)

<u>alert</u>

Message ID Sender ID Date/Time Sent Alert Status Alert Type Password Operator ID Alert Scope Restriction Address Handling Code Note Reference ID Incident ID



Event Category Event Type Urgency Severity Certainty Language Audience Target Code Date/Time Effective Date/Time Onset Date/Time Expires Sender Name Headline **Event Description** Instructions Information URL Image URL Audio URL Contact Info **Parameters**



Area Description

Polygon Circle Geocode Altitude Ceiling

Oblight The Alert Block

Basic information about this message: O Date/Time **Sender** O Message Type & Status O Distribution Scope

• Message Type

Describes the general purpose of this message:

Alert	Initial information about an event or hazard
Update	New information updating an earlier message
Cancel	Cancels an earlier message
Ack	Acknowledges receipt and acceptance of a message
Error	Indicates rejection of a message (with explanation)

• Message Status

Describes the appropriate use of this message:

Actual	Refers to actual hazards or events
Exercise	Refers to simulated hazards of events, for exercise participants
Test	Technical testing, not actionable
System	Network internal messages, updates, etc.

• Message Scope

Describes the appropriate dissemination of this message:

Public	For general delivery to unrestricted audience and the public
Restricted	For delivery only according to a specified rule.
Private	For delivery only to specified addresses.

• The Info Block

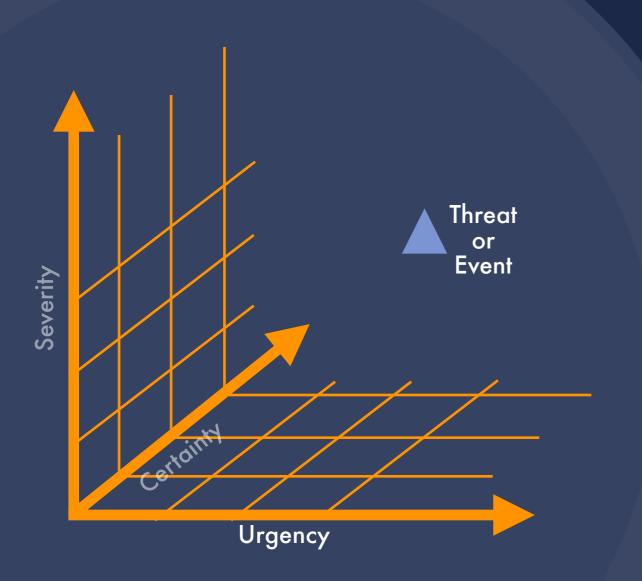
Specifics of an event or a threat: Category and description Ourgency / Severity / Certainty **O** Timeframes O Recommended action C Links to additional information

• Multiple Info Blocks

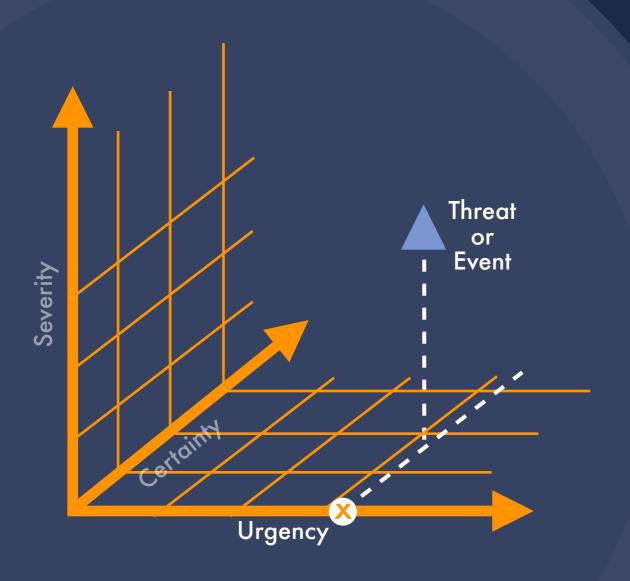
Multiple languages Different instructions or timeframes for different areas O Phased evacuation • Evacuate vs shelter-in-place • Watch vs. warning

••• Event Category (A perfect list is hard to find!)

Geo	Geophysical
Met	Meteorological
Safety	General emergency and public safety
Security	Law enforcement, military, homeland and private security
Rescue	Rescue and recovery
Fire	Fire suppression
Health	Public heath and medical
Env	Hazmat, pollution and other environmental
Transport	Public and private transportation
Infra	Utility, telecommunications, other infrastructure
Other	Not otherwise categorized

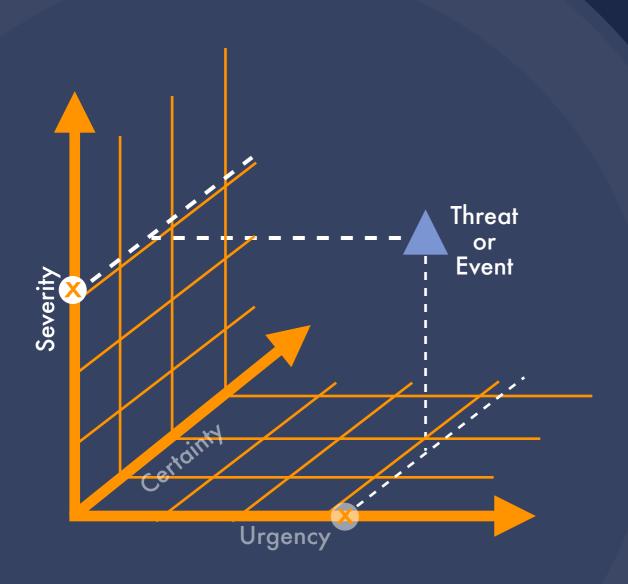


Traditional onedimensional model of "priority" is expanded into a "3D" model that expresses:



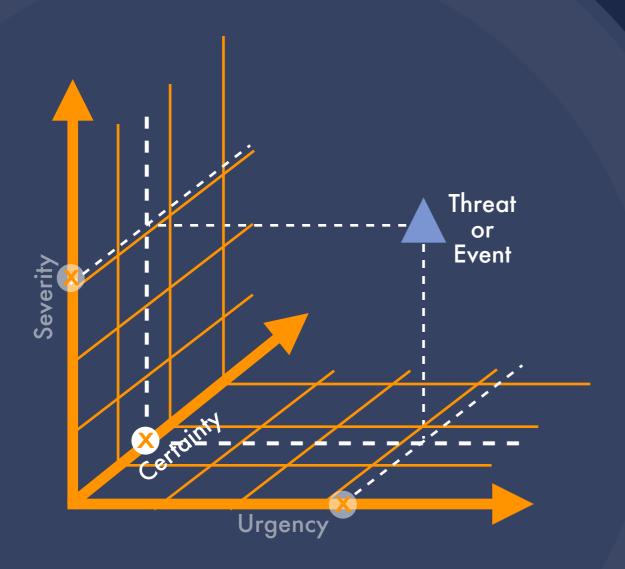
Traditional onedimensional model of "priority" is expanded into a "3D" model that expresses:

) Urgency (time)



Traditional onedimensional model of "priority" is expanded into a "3D" model that expresses:

Urgency (time)
 Severity (impact)



Traditional onedimensional model of "priority" is expanded into a "3D" model that expresses:

Urgency (time)
 Severity (impact)

Certainty

(probability)



Describes the time available to prepare:

Immediate	Responsive action should be taken immediately
Expected	Action within next hour
Future	Action in near future (typically 6-24 hours)
Past	Past, no preparatory action required
Unknown	Not known



Describes the intensity of impact (if it occurs):

Extreme	Extraordinary or large-scale threat to life and property
Severe	Significant threat to life and property
Moderate	Potential threat to life and property
Minor	Limited threat to live and property
Unknown	Not known



Describes the issuer's confidence that the event will occur or has occurred:

Very Likely	Highly likely or certain (p>85%)
Likely	Likely, although not highly likely (p>50%)
Possible	Possible but not likely (p<50%)
Unlikely	Not expected to occur
Unknown	Not known

Oblight The Area Block

Geographic target area: Text description and combo of: OGIS Polygon (area) O Point and Radius • Geographic Code Optional altitude and ceiling

Multiple Area Blocks

Multiple areas affected in same way and simultaneously:
 Multiple floodplain areas along

a river

 Multiple utility service zones
 Areas with different descriptions

• The OASIS draft

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For your review and comment: http:// www.oasisopen.org/ committees/ emergency/

• The Road Ahead

User review and comment Finalize the standard Demonstrations and reference implementations Education Widespread implementation

Oblame Contacts

for the Common Alerting Protocol project

<msg_id>43b08071-3727-41b4-\ <sender_id>U.S. Federal Gover (alert) <sent>2003-04-02T14:39:01-05:6 <msg_status>Actual</msg_status> <msg_scope>Public</msg_scope> <msg_type>Alert</msg_type> <|anguage>en-US</|anguage> <event_cat>Security</event_ca</pre> <info> <event_type>Homeland Securit; <urgency>Forecast</urgency> <severity>Severe</severity> <certainty>High</certaint) <info_url>http://www.dh

OASIS EM TC

<http://www.oasis-open.org/ committees/emergency/>

Partnership for Public Warning <http://www.ppw.us/>

CAP Working Group <http://www.incident.com/cap/>

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