DISTANT EARLY WARNING SYSTEM FOR TSUNAMIS – A WIDE AREA AND MULTI-HAZARD APPROACH –

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ABSTRACT

The DEWS (Distant Early Warning System) [1] project, funded under the 6th Framework Programme of the European Union, has the objective to create a new generation of interoperable early warning systems based on an open sensor platform. This platform integrates OGC [2] SWE [3] compliant sensor systems for the rapid detection of hazardous events, like earthquakes, sea level anomalies, ocean floor occurrences, and ground displacements in the case of tsunami early warning.
Based on the upstream information flow DEWS focuses on the improvement of downstream capacities of warning centres especially by improving information logistics for effective and targeted warning message aggregation for a multilingual environment. Multiple telecommunication channels will be used for the dissemination of warning messages.
Wherever possible, existing standards have been integrated. The Command and Control User Interface (CCUI), a rich client application based on Eclipse RCP (Rich Client Platform) [4] and the open source GIS uDig [5], integrates various OGC services. Using WMS (Web Map Service) [6] and WFS (Web Feature Service) [7] spatial data are utilized to depict the situation picture and to integrate a simulation system via WPS (Web Processing Service) [8] to identify affected areas. Warning messages are compiled and transmitted in the OASIS [9] CAP (Common Alerting Protocol) [10] standard together with addressing information defined via EDXL-DE (Emergency Data Exchange Language – Distribution Element) [11]. Internal interfaces are realized with SOAP [12] web services.

Based on results of GITEWS [13] – in particular the GITEWS Tsunami Service Bus [14] – the DEWS approach provides an implementation for tsunami early warning systems but other geological paradigms are going to follow, e.g. volcanic eruptions or landslides. Therefore in future also multi-hazard functionality is conceivable. The specific software architecture of DEWS makes it possible to dock varying sensors to the system and to extend the CCUI with hazard specific functionality.

The presentation covers the DEWS project, the system architecture and the CCUI in conjunction with details of information logistics. The DEWS Wide Area Centre connecting national centres to allow the international communication and warning exchange is presented also.

REFERENCES:

[1] DEWS, www.dews-online.org
[2] OGC, www.opengeospatial.org
[3] SWE, www.opengeospatial.org/projects/groups/sensorweb
[4] Eclipse RCP, www.eclipse.org/home/categories/rcp.php
[5] uDig, udig.refractions.net
[6] WMS, www.opengeospatial.org/standards/wms
[7] WFS, www.opengeospatial.org/standards/wfs
[8] WPS, www.opengeospatial.org/standards/wps
[9] OASIS, www.oasis-open.org
[10] CAP, www.oasis-open.org/specs/#capv1.1
[11] EDXL-DE, www.oasis-open.org/specs/#edxlde-v1.0
[12] SOAP, www.w3.org/TR/soap
[13] GITEWS (German Indonesian Tsunami Early Warning System) is a project of the German Federal Government to aid the reconstruction of the tsunami-prone Indian Ocean region, www.gitews.org
[14] The Tsunami Service Bus is the GITEWS sensor system integration platform offering standardised services for the detection and monitoring of tsunamis