

Disaster Planning for Document Management

INTRODUCTION

Internet access to public records, such as construction records, is likely to become an essential component of disaster and emergency response. Using newly available technology, the Internet can now provide reliable, immediate access to public records during and after disasters such as earthquakes, fires, storms, and floods. By providing the same Internet access during disasters that is provided on a day-to-day basis, no special disaster training will be necessary to access the public records.

Because storing hard copy records is currently necessary to provide access to records using existing manual techniques, providing Internet access will have the effect of removing the copies of the hard copy records stored in emergency operations centers. Today, these hard copy records take up valuable floor space, and can even create a safety hazard, within the emergency operations centers. At the same time, dependence on manual methods limits the records available during an emergency to the small subset that will physically fit in the limited amount of space available in the emergency operations centers.

Technically, Internet access can be guaranteed during disasters by using a multi-site Internet hosted configuration and scanning in the hardcopy documents. Assuring access to the Internet during disasters can be managed by including access reliability requirements in communications contracts, by using satellite phones, cell phones, and direct satellite Internet connections, and by monitoring the quality and reliability of Internet. As the trend to greater use of the Internet continues, Internet reliability requirements will become part of the general disaster preparedness requirements for communications quality.

Reliability and Access Requirements are Increasing

Because public documents, such as construction plans, are often at the center of disaster mitigation, access to them cannot be interrupted. In particular, access to records must not be interrupted by the disaster for which the records are needed. Concern over the inaccessibility of records during disasters is growing because the existing manual records management techniques, previously considered

adequate, have not had to deal with the magnitude of now reasonably foreseeable disasters. Manual records access cannot deal with the volume of requests received during a disaster in a timely manner, when all of the record requests are for immediate access. Secondly, manual access to records may be compromised or made impossible by the disaster itself.

Commonly held beliefs on the scale of foreseeable disasters are at odds with reality, even in the minds of many disaster planners. For example, the last big earthquake in Southern California was in 1857, almost 150 years ago. It was the 8.3 magnitude Ft. Tejon Earthquake. This earthquake ruptured the San Andreas Fault from central California to the Cajon Pass, a distance of over 225 miles (350 kilometers). The maximum ground displacement was 30 feet (9 meters). (See "Collocation Impacts on the Vulnerability of Lifelines During Earthquakes with Applications to the Cajon Pass, California", FEMA-226 (United States Federal Emergency Management Agency), February 1992, 104 pages, prepared by INTECH, Inc., Potomac, MD, <http://www.FEMA.gov>) Even more urgent is the fact that such earthquakes have occurred every 132 years, on average, over the past 1,400 years (1857 + 132 years = 1984). From paleoseismology, these big earthquakes occurred in the years AD 671±13, 734±13, 797±22, 997±16, 1048±33, 1100±65, 1346±17, 1480±15, 1812, and 1857 (Sieh, *et al.*, 1989, *Jour. Geophys. Res.*, 94, 603-623) The USGS (United States Geological Survey) forecasts that there is an 85 percent chance that a major earthquake (>7.0 magnitude) will occur somewhere on the San Andreas Fault in Southern California within the next 30 years.

In addition, Southern California, like other parts of the United States, has to deal with recent corrections to anticipated storm water flows (floods) based both on re-evaluations of historical records, and on increased runoff caused by land development. Confidence in the survival and usability of manually accessed physical records is founded on the relatively short history of past survival that does not properly account for the well documented risks known to exist in most parts of the United States for storms, floods, earthquakes, and other disasters. A map of the United States, showing all types of 100-year events, might show that no part of the United States has experienced 100-year events for all types of disasters.

To meet the increasing reliability and accessibility requirements, a hosted Internet server configuration for public document access would place the documents on

computers at three sites on the Internet. For Southern California, two of the Internet sites would be outside of Southern California, and the state of California, at least 450 miles (750 Kilometers) from the San Andreas Earthquake Fault, and possibly at one site in Southern California.

Disaster Plan

During a disaster, people find it easier to do what they normally do, rather than doing things they have only rarely practiced in disaster drills. For example, errors made when loading a backup computer tape after a disaster, a time of duress, can include erasing the backup tape.

A hosted Internet server will provide the same service during and after a disaster that it normally provides, while at the same time supporting a load increase of at least a factor of ten during and after a disaster. These requirements need merely be specified. The capability to meet these requirements has recently become commercially available, and can be audited and verified (An example is <http://www.Pilot.net>). In general, the disaster plan, for Internet based public records access, is to plan, require, and audit before disasters, so that during a disaster, no additional action is necessary.

Access to the hosted Internet servers is contingent on the survivability of local Internet connections. Local Internet connections can be supplemented by satellite phones and by emergency satellite links brought in during a disaster. An example of Internet satellite links is provided by Microsoft <http://www.Microsoft.com> and Gilat <http://www.gilat.com/gilat> The Internet was originally designed to survive nuclear war, and the Internet infrastructure remains robust. Local link requirements for Internet provider disaster survivability could be created, for use by both government workers and citizens. The performance of Internet providers could then be audited based on these disaster survivability requirements. This would be no different than existing reviews of other elements of the public and private infrastructure for disaster survival and recovery.

An example of a disaster survivability requirement for an Internet based public document access system is a less than one second backup switch-over time for any foreseeable disaster, with a maximum of 1 hour of downtime, for any reason, per century. (Telephone central offices, of which there are over 6 thousand in the United States, have averaged less than 2 hours of downtime per forty years.)

Public documents access systems are particularly simple to provide via multiple Internet sites because they are relatively static, often being changed once per month, with daily updates considered an extremely fast rate of change. Only a very small percent of stored documents are changed at any one time, and changes are almost always limited to additions, usually due to restrictions in public document laws. These properties greatly simplify the task of providing high system availability and a very fast switchover time between multiple duplicate online systems.

In addition to protection from natural disaster, hosted servers provide a well-defined level of protection from most systemic failures and malicious acts.

Shared Expenses

Day-to-day access to public records will be improved by the scanning done to improve access during disasters. It is likely that day-to-day access can share the expense of preparing the records for Internet access during times of disaster.

Internet access to databases used by disaster workers will share the same Internet access that is used to access the systems that store public records. Therefore, it is possible that the disaster database systems can share in the expense of providing Internet access to public records.

Local Support

Because the Internet is by definition distributed, all jurisdictions, and private organizations, can contribute independently to successful disaster mitigation responses.

Summary

For access to public records, it is now possible to have a disaster plan of business-as-usual from the point of view of system users. This will reduce disaster preparedness costs by sharing both system and training costs with non-disaster related uses. In addition, a business-as-usual plan will not only enhance the mitigation of the effects of disasters, it will free up time of everyone affected by the disaster for tasks other than access to public records.

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Note to Editors

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