

Pandemic Flu and Computer and Network Disaster Recovery Planning: Some Starting Thoughts

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Joe St Sauver, Ph.D. (joe@uoregon.edu)
Manager, Internet2 Security Programs
Internet2 and the University of Oregon
<http://www.uoregon.edu/~joe/flu/>

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Previous Salsa Disaster Recovery Topics...

- Increasingly demanding requirements have driven a growing number of universities toward a continuously synchronized "**hot site**" model for IT disaster recovery/business continuity purposes (www.uoregon.edu/~joe/dr-bcp-bof/disaster-recovery-bof.ppt)
- We've also talked about the importance of having a **real time mass notification capability** for use during a disaster/other emergency (www.uoregon.edu/~joe/notification/emergency-notification.ppt)
- Pondering the remainder of the disaster recovery/business continuity space a bit the one thing which keeps popping up is **pandemic influenza**.

Why Would A Pandemic Flu Outbreak Impact IT System and Network Operations?

- Information technology impacts associated with pandemic flu may involve either personnel or infrastructure:
 - Unlike some other business continuity scenarios, a pandemic is a failure of the **human elements** of the computer/network system. Key IT personnel (just like anyone else) may contract the flu and cease to be available to do mission critical IT-related work; others may simply hunker down in an effort to avoid becoming infected. Absenteeism may be widespread.
 - IT-critical infrastructural services (such as electrical power) may become unavailable during the outbreak, potentially causing **cascading failures to occur**. Your facilities may be fine--but you may still end up impacted by failures elsewhere.
- In fact, IT systems and networks may play a crucial role in helping institutions to cope with pandemic influenza...

Got Flu? Move Stuff to the Online World...

- **Academic course work may move largely online**, by preference or by mandate (e.g., if large gatherings of individuals are banned)
- Quarantine measures and the need to provide care for infected family members may drive **increased demand for remote access** (to support work-from-home, etc.)
- Travel limitations will likely drive **increased demand for video conferencing** as a safe/approved alternative to national meetings
- Overloaded health delivery facilities may attempt to use **telemedicine** to meet the surging demand for medical services
- A tremendous amount of **personal messaging** (email, VoIP, etc.) will occur as families attempt to stay current on who's sick and who's well, etc. Many will also turn to the Internet for information about the pandemic, searching the worldwide web for information. **Recreational use** of the Internet may also rise dramatically given a bored, frightened, house-bound population.

Is The Pandemic Flu Really Something Which Will Likely Happen?

- "Will a pandemic influenza occur? If so, when will it happen?
Answer: **Many scientists believe it is a matter of time until the next influenza pandemic occurs. [...]**"
<http://www.pandemicflu.gov/faq/pandemicinfluenza/1071.html>
- **"More than half of U.S. companies think there will be a global flu epidemic in the next two years.** Two-thirds think it will seriously disrupt their operations as well as foment social unrest. But two-thirds also say they aren't prepared. One-third of executives surveyed say nobody in their organization has been appointed to plan for a pandemic; another one-quarter couldn't or wouldn't answer the question." [<http://www.washingtonpost.com/wp-dyn/content/article/2006/05/01/AR2006050101608.html>]
- In November 2005, President Bush requested **\$7.1 billion** in funding to help prepare for avian influenza (see budget details at http://opencrs.cdt.org/rpts/RS22576_20070123.pdf)

Why Is Pandemic Flu Potentially Such a Big Deal?

- The federal government doesn't make and approve multi billion dollar budget requests casually... Pandemic flu is being treated as potentially a very, very, big deal.
- Let's start with the 10 things the World Health Organization believes you should know about pandemic influenza...

World Health Organization: 10 Things You Need to Know About Pandemic Influenza

1. Pandemic influenza is different from avian influenza.
2. Influenza pandemics are recurring events.
3. The world may be on the brink of another pandemic.
- 4. All countries will be affected.**
- 5. Widespread illness will occur.**
- 6. Medical supplies will be inadequate.**
- 7. Large numbers of deaths will occur.**
- 8. Economic and social disruption will be great.**
9. Every country must be prepared.
10. WHO will alert the world when the pandemic threat increases.

Each of those points is discussed in more detail at

www.who.int/csr/disease/influenza/pandemic10things/en/index.html

The Influenza Pandemic of 1918

- **Worst pandemic in history, killing more than 50 million,** perhaps as many as 100 million. [http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=11875246&dopt=Abstract] For comparison, ~19 million died in WW I.
- 50 million deaths from a 1918 base population of 1.8 billion ==> 2,777 deaths/100,000 people. **Extrapolating that fatality rate to today's population of ~6.5 billion ==> 180 million deaths today** [<http://content.nejm.org/cgi/content/full/352/18/1839>]
- "A total of **ten amino acid changes** in the polymerase proteins consistently differentiate the 1918 and subsequent human influenza virus sequences from avian virus sequences. Notably, a number of the same changes have been found in recently circulating, highly pathogenic H5N1 viruses that have caused illness and death in humans and are feared to be the precursors of a new influenza pandemic." [J. Taubenberger, Nature 437, 889-893 (6 Oct 2005)]

H5N1 Avian Flu as a Candidate Pandemic Agent

- While there are many infectious agents which might cause a pandemic, one of the most discussed ones is H5N1 avian flu.
- The bad news:
 - H5N1 has infected humans via direct exposure to sick birds or their droppings, etc.,
 - when humans do contract H5N1, it can be potentially fatal,
 - treatment and prevention options for flu, a virus, are limited.
- The good news: there's currently no known human-to-human transmission path for H5N1.
- The worry: influenza is known to routinely mutate from year-to-year, and it is possible that one such mutation may yield a version which CAN spread human-to-human. Given high levels of **transcontinental and international travel**, if human-to-human spread becomes possible, spread of the disease may be rapid.

Speaking of Travel, Travel Controls for Potentially Infected Individuals Are Still Far From Perfect

- "TB patient insists he was never banned from travel"
<http://www.cnn.com/2007/POLITICS/06/06/tb.borders/index.html>
- "Measles outbreak reported in Eugene: Officials said it's the second local case; the disease has probably been transmitted to others" <http://media.www.dailyemerald.com/media/storage/paper859/news/2007/06/05/News/Measles.Outbreak.Reported.In.Eugene-2911826.shtml>

"[...] this shows you just how ill-equipped we might be for dealing with an illness such as a pandemic influenza case." Officials said the man who was first diagnosed with measles may have exposed people at: United Flight 6406 from San Francisco to Eugene, May 22. [...]"

Additional Facts About Avian Influenza Today

- **Over 220 million birds have died or been sacrificed** in an effort to halt the disease [influenza.un.org/index.asp?PageID=169]
- Countries where avian influenza has been confirmed in birds: Korea, Viet Nam, Japan, Thailand, Cambodia, Laos, Indonesia, China, Malaysia, Russia, Kazakhstan, Mongolia, Turkey, Romania [www.who.int/csr/disease/avian_influenza/avian_faqs/en/]
- There've been 317 cases of human infection with H5N1; 191 died [http://www.who.int/csr/disease/avian_influenza/country/cases_table_2007_06_29/en/index.html] ==> **60% human mortality overall** (but this can vary from country to country -- for example, 81 of 102 cases in Indonesia have been fatal).
- Countries where avian influenza has been confirmed in humans: Cambodia, Indonesia, Thailand, and Viet Nam (plus HK ca 1997) [www.who.int/csr/disease/avian_influenza/avian_faqs/en/]

How Should Sites Be Thinking About This?

- **Pandemic planning should be part of a site's overall disaster recovery and business continuity planning**, but if that's been going slowly, it may be worth starting to plan for pandemic flu as a special project in parallel with general DR/BCP efforts.
- **There's a good general college/university checklist** at <http://www.pandemicflu.gov/plan/school/collegeschecklist.html> but that checklist doesn't really dig down into the system and network specific side of things.
- **Some sites have been doing a great job when it comes to doing pandemic flu planning, including in an IT-related context.** For example, see: <http://safetyservices.ucdavis.edu/emergencymgmt/AvianInfluenza.cfm> -- I am particularly impressed by their development of alternative scenarios for "campus open" vs. "campus closed" crossed with different tiers of staff absenteeism (0-33%, 34-50%, 51-75%, 76-85%, 86%-up).

Some Specific Questions to Ponder

- **Do you have "key IT people" who do things that "no one else can do?"** Identify them, and consider augmenting staffing for those key roles, and be sure to cross train existing staff members!
- **All routine procedures should be well documented**, so that if a system programmer or network administrator isn't available, others can follow the documented procedure to do routine tasks.
- **What about passwords in particular?** Do you have a process for emergency access to critical passwords (such as enable on routers, or root or administrator passwords on systems)?
- **Are facilities remotely (but securely!) accessible**, so that if travel is limited, or key staff are busy at home with family members, they can still do critical work? Or do systems routinely need remote hands for reboots, backup tape changes, etc.? Are some systems or resources limited to "on-campus-access only?"
- **Can you run unattended for protracted periods of time?** ¹³

Are University Faculty/Staff Ready to Work Offsite?

- Do university faculty/staff have **broadband connectivity**? (I would assume that getting broadband installed after a pandemic flu occurs might be tricky...)
- Do they have a **university-provided system** at home? (You don't want faculty/staff routinely doing university business on a system they're sharing with their family members) Are those systems up-to-date?
- Is connectivity between the home system and the university **secure**? If you're using a VPN for that purpose, does it have sufficient capacity?
- How will you communicate with employees who are all offsite? Do remote users have **VoIP and video conferencing** capabilities? Are those facilities tested and routinely being used? (Or is email and POTS enough?)

Will You Try to Have Uninfected Staff Remain On Site in Isolation?

- If you plan to have uninfected staff remain on site, isolated in your facility and away from potential infection, will you have basic requirements to support their sheltering-in-place, such as:
 - supplies of drinking water, in case potable water supplies fail
 - reserves of food ("MREs" or canned goods), and cooking gear
 - sanitation facilities which don't require working sewer systems
 - backup supplies of any prescription medications which staff may routinely require, such as insulin, etc.
 - spare clothing
 - cots and sleeping bags
 - emergency cash (e.g., if staff need to buy diesel for a generator or handle other unforeseen contingencies)
 - face masks, gloves, hand sanitizer, disinfectant, trash bags, etc.
- Are you adequately provisioned for days? **Weeks? Months?**

Pay Attention to Departmental and Offsite Partners

- When you begin looking at planning for pandemic influenza, don't forget about your departmental and offsite partners... what are they doing to become prepared to cope with pandemic influenza? You should reach out to them and share your concerns and the steps that you're considering taking. Offsite and departmental partners may also serve as a crucial source of emergency temporary staffing...
- Track vendor and other visits, and identify examples where mission critical resources would have been impacted if those visits couldn't have taken place.

Architectural Redundancy

- If you currently rely on human intervention to restore systems or networks post-outage, should you plan to add additional architectural redundancy so that unattended failover can occur, instead?
- Is that redundancy end-to-end, including wide area connectivity, the campus LAN, networked systems, end-user access?

Discussion/Questions?