

**NYTSL Spring Event**  
**I.T. Disaster Recovery**  
**Near the World Trade Center –**  
**And What I.T. Disaster Recovery**  
**Technologies Have Emerged Since That**  
**Fateful Day**

Frank J. Monaco  
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5/6/2015

# Abstract

- Following the September 11, 2001 terrorist attacks on the World Trade Center, nearby Pace University faced emergency conditions in implementing a less than perfect IT Disaster Recovery plan.
- This presentation will first review, from the point of view of the then current Chief Information Officer, what his organization (and the entire University) faced and how he and his team dealt with the situation.
- After this review, a discussion of what digital disaster recovery technologies have emerged since that fateful day, and how Universities, to include their libraries, can take better advantage of these DR developments.

# Colonel (US Army, Retired) Frank J. Monaco

- I am a retired US Army Colonel who has been involved with leading Information Technology Teams for a very long time.
- I have been the Chief Information Officer at two major US Universities (the United States Military Academy at West Point, NY and Pace University, NY) and have led I.T. Teams during numerous Military Assignments.
- I have taught Computer Science at West Point as well as for the University of Maryland (MD) and Jefferson Community College (NY) (face to face).
- I am now an IT Consultant and teaching online for the University of Maryland University College (Graduate Cyber Security) and Charter Oak State College, CT (Computer Science, Information Technology Leadership, and Cybersecurity).
- I can be reached @ProfessorMonaco.

5/6/2015

“A *great* plan, *violently* executed,  
is better than  
a *poor or incomplete* plan, *violently* executed,  
and much better than  
a *great* plan, *poorly* executed,  
and much, much better than  
a *poor or incomplete* plan, *poorly* executed.”

- Anonymous US Army Proverb

# What We Will Cover

1. Review 9-11-2001 from the then current Pace University CIO's Point of View\*
2. What concrete actions the University took to correct deficiencies in our Disaster Recovery Readiness after 9-11-2001.
  - Re-list original lessons learned from Educause Article.
  - List initiatives that took place immediately after normal operations were restored
3. Update status for May 2015 with Focus on:
  - Technology Developments impacting University DR
  - Digital Library needs for “Business Continuity”
4. What still remains to be done!

\* Assumes attendees have read IT Disaster Recovery Near the World Trade Center article

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# Background: Pace University Major Campus/Sites – as of 9-11-2001

- Manhattan, NYC, NY
  - World Trade Center #1 55<sup>th</sup> Floor (Pace World Trade Institute)
  - Pace Plaza (Main Manhattan Campus) (.14 miles)
  - Midtown Campus (3.64 miles)
- Westchester County, NY
  - White Plains, NY (33 miles)
    - Law School
    - Graduate Center
  - Pleasantville, NY (35 miles)
  - Briarcliff Manor, NY (37 Miles)
- Orange County, NY
  - Pace Hudson Valley Center, New Windsor, NY (77 miles)

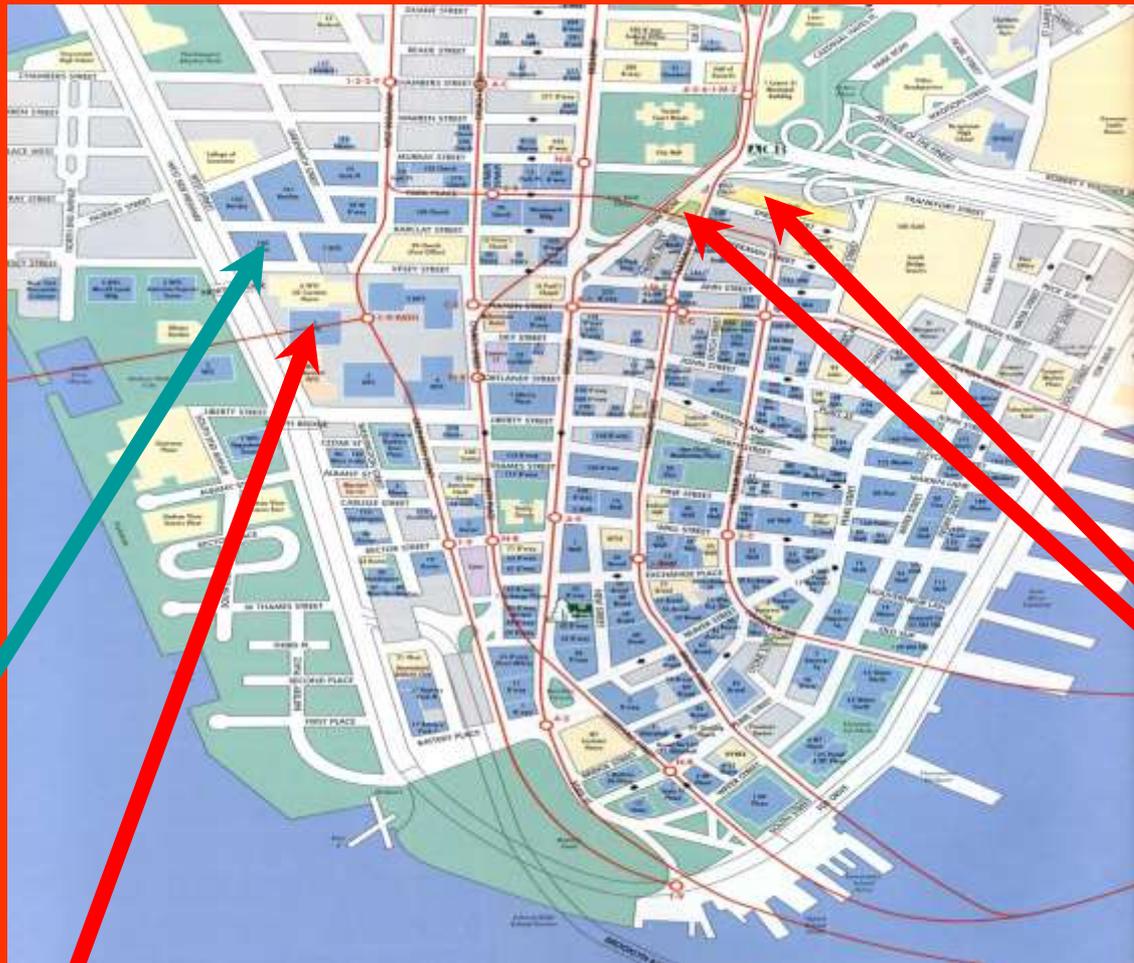


View from the Frankfort Street Side of Pace's downtown campus (World Trade Center smoke in background, about 6:00 PM, September 11, 2001)

# Verizon Dial Central Office Failure

- 140 West Street (Largest Dial Central Office in the World, at the time) off line because of collateral damage
- Telephone/data service to lower Manhattan was lost – and Internet Service was lost for all Pace Campus Sites.
- Cell phones very intermittent for days due to antenna destruction and cell overuse
- Dorm phone service on all campuses affected by Verizon outage





**Verizon**

**Pace Main Campus**

**Pace WTC Site**

**Downtown Manhattan NYC**

# Another View

Verizon

Pace Main Campus



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Pace  
WTI

# Review: What Immediately Happened to Pace on September 11, 2001

- Pace's World Trade Institute (55<sup>th</sup> floor, WTC Building #1) destroyed – employees and students escaped
- 4 current (at the time) Pace Students and over 60 Pace Alumni were lost in the WTC Sep. 11 attacks (working in the facilities)
- Pace Dorm Students (Downtown Manhattan) were safely evacuated from Pace's downtown campus – most walked across Manhattan Bridges to outgoing transportation, some transported to Pace Westchester Campus sites
- Pace Command Center was set up in Midtown—President, CIO, Executive Committee (already there for a Board Meeting)
- Pace's downtown campus “commandeered” by emergency personnel and served as triage and communications center
- Communications (Data, Voice, Cell) severely disrupted in NYC

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# Review - What is I.T. Disaster Recovery?

- Maintain minimum I.T. services needed to keep business running
- Restore all functions to normal as soon as possible
- **“Disaster”** A catastrophic occurrence that adversely affect the business or organization, or those occurrences on a grand scale that disrupt the business’s ability to function.

# What Concrete Actions the University Took to Correct Deficiencies in our Disaster Recovery Readiness after 9-11-2001

- **Developed a formal I.T. Disaster Recovery Plan with a I.T. Disaster Recovery Team consisting of key I.T. and functional area staff**
- **Developed and maintained better relationships with external providers (e.g. Verizon, AT&T Wireless, Dell, Apple, Computer Associates)**
- **Ensured that our primary and alternate ISP routes did not go through the same Dial Central Office or Major Internet Point-of-Presence**

# Extract from the I.T.DR Plan - 2

- The Disaster Recovery Plan preparation process included several major steps as follows:
  - Identified Systems and Applications currently in use.
  - Analyzed Business Impact of computer impact and determination of critical recovery time frames.
  - Determine Recovery Strategy.
  - Document Recovery Team Organization.
  - Document Recovery Team Responsibilities.
  - Developed and Documented Emergency Procedures.
  - Documented Training & Maintenance.
- Mission and Objectives
  - The mission of the Disaster Recovery Plan is to establish defined responsibilities, actions and procedures to recover the Pace University Information Technology environment in the event of an unexpected and unscheduled interruption. The plan is structured to achieve the following objectives:
    - Recover the physical network within the Critical Time Frame established and accepted by the user community.
    - Recover the applications within the Critical Time Frame established and accepted by the user community.
    - Minimize the impact on the business with respect to dollar losses and operational interference.

# DR Site Established

- Disaster Recovery site was established to duplicate mission-critical applications that are housed in our upstate central I.T. facility.
  - The site included “backups” for mission-critical servers, and a separate ISP connection.
  - Pace incorporated ongoing testing of I.T. Disaster Recovery systems, applications and Internet presence in all current and future initiatives.
  - Pace began using various types of technology to synchronize the data on production and Disaster Recovery servers. This included software and hardware-based replication.

# Emergency Communications Centers

- Communications Centers were set up on each Pace campus. Each Center was equipped with cell phones, laptop computers, television sets, and backup batteries. The equipment at each Communication Center was tested and replenished monthly.
- Features:
  - Data, Video, Voice, Wireless connections
  - Rosters, Critical data replicated at each site as well as supplies
  - UPS Power

# Cabinet in Emergency Communications Center



Supplies

Notebook computers and Printers

TV, Radio

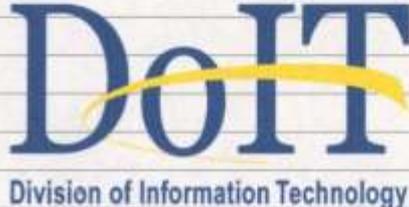
Different Cellular Providers

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# More “Concrete Actions” - 1

- **Developed an “accurate” cell phone directory with University (and non-University) owned cell phone numbers—on line as well as on Emergency Contact cards.**
- **Integrated DR into the University’s Web Presence for emergency protocols also hosted at the Disaster Recovery site.**

# How we Communicated during the Crisis

Pace University	As Of:	10/12/01 3:33 PM
<b>World Trade Center Tragedy September 11, 2001</b>		
<b>Telecommunication and Management Information System Resources Status</b>		
Resource	Status	Remarks
Cable TV - 135 Williams Street	RED	1-2 Weeks ETR - West Street Problems
Data T-1 - Murray Street (SOE)	RED	No ETR - Pace employees being moved to old bookstore area; DoIT equipping with PCs
Dial Tone - Some PNY Phones	AMBER	Report remaining issues/problems to #DOIT on a case by case basis
Voice Mail - PNY	AMBER	1-2 Weeks ETR - West Street Problems - enter last four digits when prompted for Mailbox # and it works! (also works when dialed from Outside of Pace)
Video Conferencing System - 1 PP	AMBER	No ETR - Verizon Problem - Implemented vBrick usage as temporary solution.
Data T1s to 135 Williams Street (Pace Dorm)	GREEN	1 of 2 T-1's in building available. All building traffic re-routed to use the operational T-1
CENTREX 156 Williams	GREEN	Report Further Problems to #DOIT, doit@pace.edu
		
KEY:		
ETR		Estimated Time to Repair
GREEN		Normal
AMBER		Limited functionality and/or reliability
RED		No functionality

# How We Communicated After the Crisis: [Status.Pace.Edu](http://Status.Pace.Edu)

## IT Status

[Current Status](#) | [Previous Posts](#) | [ITS News](#) | [Spam Alerts](#) | [Contact ITS](#)

### System Outages

There are currently no system outages.

### Scheduled Maintenance

Title (click for details)	Location	Start Date/Time
Server Maintenance		Thursday, February 12 10:00 PM
Lecture Capture (Echo 360) Maintenance		Friday, February 20 5:00 PM

### Recurring Maintenance

Blackboard Learn - Daily Morning Maintenance		Monday-Friday, 6:45 AM - 7:30
Blackboard Learn - Weekly Maintenance		Sunday, 4:00 AM - 4:30 AM
SASSERVPROD and RePortal - Weekly maintenance		Monday, 7:00 AM

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## More “Concrete” Actions – 2

- Alternate (e.g. home) email addresses were now being recorded on each student’s permanent record in our Student Information System.
- Pace was now prepared to extract snail mail rosters from our data warehouse for all conceivable University constituencies (e.g., parents of NYC dorm students)

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# DR -> Moving to The Cloud

Universities have been doing lots of work over the past few months analyzing what they have in the cloud and what they could/should/want to move to the cloud. DR is a major part of this consideration as is how they can free up staff to work on more mission-critical tasks (NOT to reduce headcount!).

- % of the Central IT Budget spent on cloud-based services should increase.
- Many Universities still host all major systems (Banner, Bb, Email, Portal, Library) in-house, but they are seriously considering outsourcing.
- When they consider new services, Universities should be looking to do hosted solutions instead of hosting internally.
- DR should also be considered for “movement to the cloud”.

# Digital Library Specific DR - Springshare

1. **We "Get" Libraries** - More than half of our team are librarians who worked at libraries of all types and sizes. We "get" the specific technology and workflow needs of libraries. We understand you're busy bees, constantly tasked to do more with less. Our tools help you save time and money, and provide value to librarians and patrons alike.
2. **Our Apps Make \*You\* the Rockstars in Your Community** - Our customers tell us every day that their users/patrons sing praises about library-branded Springshare apps. Librarians being appreciated for all the work they put in and for services they provide - that's an "undocumented feature" of all our tools.
3. **We're Here to Support You – Always** - Our support is legendary - just ask any of our clients. Our customers also get free training, free access to exclusive SpringyCamp virtual conferences, free access to Springshare Lounge - our user community brimming with exchange of ideas, best practices. As a Springshare customer, you are never alone.
4. **Great Return On Investment** - We always ensure that our customers get the most bang for every buck invested in our tools. We keep our prices low, and we work with library consortiums to provide further discounts to our clients. The proof is in the pudding: 4,300+ customers and 99% renewal rates for our apps.
5. **We Support the Library Community** - We are proud to support the library community through various conference and event sponsorships, as well as several Springshare-funded scholarship awards for librarians. We are always looking for creative ways to give back and support libraries and librarianship.

# Digital Library Specific DR

- Integrated Library System – Millennium Innopac
  - Still using traditional backups and off-site storage
  - Investigating Cloud Storage but expensive – seeking grants to fund
- Alternative Access (Innopac not available)
  - OCLC Worldcat – Book and Serials
  - CONNECTNY – 8 Million Titles in a Consortium Arrangement
  - WALDO – Book Collection
  - METRO Visitors Pass
  - Westchester Libraries
  - NY Public Libraries
  - Additional “cloud” library services from NYS – e.g., [www.novelnewyork.org](http://www.novelnewyork.org)

# Digital Library Specific DR

- Innopac servers are backed up (disk to disk) - daily transactions are stored off site in a protected environment.
- In the event of total destruction of the server, SLA from Innopac contract will provide all the necessary help to setup a new server.
- Backup, preservation and restoration of daily transactions of the Innopac server based on user activities are the responsibilities of Pace Libraries.
- **NOTE: Iron Mountain serves as backup repository, as well as by University Archives.**

# Digital Library Specific DR

- Digital Repository (the Digital Commons), vendor BePress uses "Amazon Glacier" to store and backup our data within the repository.
- For more information about Amazon Glacier, you may check:

<http://aws.amazon.com/glacier/faqs/> .

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# What Still Needs to Be Done “Generally Speaking”

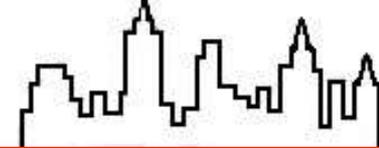
- Continue to conduct routine DR exercises
- Continue to schedule and maintain routine DR equipment serviceability checks
- Continue to fight for “built-in” DR in every new project

# Most Important Lessons Learned

- I.T. DR has to be integrated into all projects from Day 1.
  - DR is no longer an annex or afterthought.
  - Funding for projects do not go forward unless DR is included.
  - Radical shift from the way we used to do this!
- DR is a University Issue – not only I.T.
  - Safety and Security have important roles
  - Leadership has to be on board!

# Additional Reading

- Monaco, Frank J. *IT Disaster Recovery Near the World Trade Center*, <http://net.educause.edu/ir/library/pdf/eqm0144.pdf>, Educause Quarterly, November 4, 2001, pp. 4-7.
- CSO Business Continuity and Disaster Recovery Planning – The Basics, <http://www.csoonline.com/article/204450/business-continuity-and-disaster-recovery-planning-the-basics>
- Disaster Recovery and Business Continuity Template (Example Only) - <http://www.e-janco.com/DRP.htm>
- Top Ten Reasons Why Disaster Recovery Business Continuity Plans Fail <http://blog.e-janco.com/2012/09/01/top-ten-reasons-why-disaster-recovery-business-continuity-plans-fail/>
- Best of Breed Disaster Recovery Business Continuity - <http://blog.e-janco.com/2012/08/19/best-of-breed-disaster-recovery-and-business-continuity/>
- Top 10 Disasters that CIOs Need to Plan For - <http://www.insurancenetworking.com/gallery/janco-disasters-business-interruptions-30859-1.html?ET=insurancenetworking>



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