

# Outage at UAA: A Week Without Critical Information Systems

*Bogdan Hoanca, Computer Information Systems, College of Business and Public Policy,  
University of Alaska Anchorage, Anchorage, AK, USA*

*David Fitzgerald, Computer Information Systems, College of Business and Public Policy,  
University of Alaska Anchorage, Anchorage, AK, USA*

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## EXECUTIVE SUMMARY

*With redundant hardware, it is rare that a disk failure results in downtime at the system level. System failures do sometimes occur, typically as a sequence of very rare events that leads to a catastrophic failure. This case describes how a combination of hardware and firmware failures, along with human error, led to the failure of a redundant disk storage unit, which in turn affected several enterprise systems at a major public university. Subsequently, a small number of conservative and seemingly “good” decisions in the process of restoring the system from backups led to negative outcomes, primarily additional downtime over the course of several days. The case illustrates how even well-considered and conservative decisions may seem flawed in hindsight. An important lesson from the case is that it is difficult to justify to management the provision of sufficient backup resources to prevent very low-probability failure events.*

*Keywords: Business Continuity, Disaster Recovery, Disk Failure, Information Technology Services (ITS), System Outage*

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## ORGANIZATION BACKGROUND

The University of Alaska Anchorage (UAA) is the largest of three universities in the State of Alaska public university system. The two other universities are the University of Alaska Fairbanks, the oldest Land, Sea, and Space Grant institution in the state, and University of Alaska Southeast, in Juneau, the state capital. Founded in 1954 as the Anchorage Community College, UAA has grown to a student body of almost 20,000 students, offering more than 200

degrees and certificates ranging from two-year Associates degrees to PhD degrees. In addition to the main campus in Anchorage, UAA consists of a joint base Elmendorf/Richardson military extension center, and community campuses in the Matanuska-Susitna Valley, Eagle River, and the more remote communities of Kenai Peninsula, Prince William Sound, and Kodiak (the last one being on an island off the road system).

Faced with the need to reach a highly dispersed population in the largest state in the United States of America, UAA was one of the

early adopters of distance education, from the time when distance education relied on mailed paper documents, phone based teleconferences, and videocassettes (Hoanca & Mock, 2007). Current Internet-based technologies, have not fully replaced many of the earlier ones, although UAA is a heavy user of Blackboard™ as a course management system, and of Elluminate Live!™ (eLive!) as a synchronous teaching environment. Of the approximately 8000 sections of different courses offered in any given semester, approximately 8% are using online delivery or are classified as distance education classes. Some of the distance education course sections that are taught in the remote rural Alaska communities off the road system still rely primarily on mailed papers and satellite TV to reach students for whom Blackboard or eLive! are not yet available.

Although only approximately 40% of the course sections taught at UAA use Blackboard, not all of these are intended for students who are off campus. Many courses are offered in a blended format in which online components complement regular in-class face time. Nonetheless, Blackboard is typically used in such courses to make course materials, tests, and grades available to students. Much of the out-of-class student-teacher interaction relies on email messages, or on communications using the discussion board feature of Blackboard. Virtual office hours are often held in eLive!, even for classes that include weekly face-to-face meetings.

## SETTING THE STAGE

Given the importance of technology in delivering both distance and blended courses, the Information Technology Services (ITS) group at UAA is committed to delivering high availability and reliability across the variety of technology platforms they manage on the main campus and the community campuses. The head of ITS, CIO Rich Whitney, arrived at UAA in the year 2000, and over the years has seen his budget shrink, even while his menu of service

offerings has expanded considerably. At the same time, the university community has grown to rely more and more on ITS and to expect high availability from an increasingly complex system of interoperating application. Some of the enterprise infrastructure in the University of Alaska system is funded and hosted centrally at the University of Alaska Statewide offices in Fairbanks, but much more is hosted and operated locally at each of the three campuses in the UA system, or even hosted and operated by one campus on behalf of all three. For example, UAA has its own instance of Blackboard, and it hosts eLive! for all three campuses.

To be able to deliver quality and reliability with a shrinking budget, without adding staff positions, and with an ever-expanding menu of services, CIO Whitney flattened his organization, diligently eliminating management levels (see Figure 1). He also spent time and effort training and grooming staff, because the Anchorage community has rather limited availability of key technical personnel. Out of state recruiting is both expensive and problematic, with some newly hired staff members moving back to the Lower 48 as soon as they experience their first Alaskan winter. CIO Whitney also implemented the ITIL (Information Technology Infrastructure Library) framework, first in the Call Center, and then across the entire ITS organization (Hoanca & Whitney, 2010), and has seen the typical increases in efficiency as a result (Feldman, 2006).

## CASE DESCRIPTION

Much of the computing hardware that supports teaching and administrative functions at UAA is located in the Anchorage Data Center on the UAA main campus. An Enterprise Virtual Array (EVA) houses several banks of disks that provide storage for Blackboard, eLive!, the UAA website, as well as for the UAA employee email for both faculty and staff. These are critical information systems, without which the operation of the entire institution is severely impacted. For security and privacy reasons, the

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