Enterprise Architecture (EA) at UA and UAS

Prepared by: Michael Ciri, Information Technology Services Director
June 9, 2008

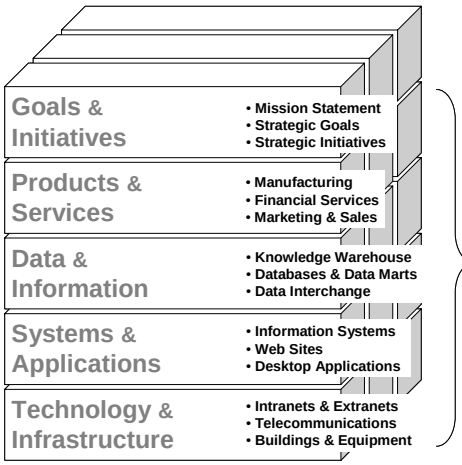
The concept of "Enterprise Architecture" has been gaining increasing attention throughout UA – especially at the System-Wide level. The recent "External Administrative Review" served to underscore the role that EA will play in UA technology management[1]. Unfortunately, "Enterprise Architecture" is ambiguously named and it is difficult to drill beneath the jargon to determine what it is on a practical level. The purpose of this document is to briefly describe what EA is and how current UAS IT strategies align with it.

EA is:

- A communication and documentation strategy
- A planning and decision-making discipline

Goals of EA:

- Link technology strategy to institutional strategy
- Identify and communicate inter-relationships and dependencies
- Reduce complexity and promote economies of scale by developing a common "portfolio" of standards, tools and services



Source: Scott Bernard, PhD

Enterprise Architecture has gained wide adoption in both the private and public sector. OMB has adopted EA to meet the mandate of Clinger/Cohen Act[2]; however, EA is still immature as a formal discipline. There are multiple EA frameworks to choose from (an example is shown above), and these frameworks are not interchangeable. Many of the methodologies of EA look familiar, and large portions EA borrow from well-established management practices[3]. What distinguishes EA is:

1. an emphasis on looking at the technology infrastructure as a whole,
2. identifying how technology strategies are linked to organizational objectives, and
3. creating understandable documents (or "artifacts" in the language of EA) that can be used to communicate both the current and desired future states.

This final point is central to Enterprise Architecture and is the area where UA is weakest. While MAUs have established technology strategies, there are few artifacts that articulate these strategies. Further, there is no standardization among the artifacts that exist, so comparison among MAUs is difficult. In the absence of documented strategy, there is a tendency to launch new projects without regard for how the project will fit into the existing architecture – especially when projects cross MAU boundaries.

---

[1] MacTaggart and Rogers, *Planning the Future: Streamlining Statewide Services in the University of Alaska System.*
[2] http://www.cio.gov/Documents/it_management_reform_act_Feb_1996.html
[3] A recent consultant to UA offered that EA, in many cases, is simply "commoditizing common sense."

EA at UAS

UAS has not adopted a formal EA framework nor have we attempted to express our strategies in the language of EA. However, the strategic alignment of UAS technology is "foregrounded" in the strategic plan (as noted in the 2004 Regular Interim Visit Report from NWCCU[4]). UAS has a high degree of technological standardization and these standards are used when evaluating new technology projects. Since UAS has a focus on operating as a regional university, these standards extend to all campus sites. Finally, UAS has a number of established artifacts that have been used to communicate technology strategy both internally (as part of the annual operating review) and to external groups such as the accrediting teams and Legislative Audit.

For reference, six of these artifacts are included as attachments:

Attachment 1: UAS ITS Mission & Objectives
Attachment 2: Alignment of ITS Objectives to UAS Strategic plan and UA PBB Goals
Attachment 3: UAS ITS Significant Planned Projects
Attachment 4: Instructional Technology Strategy Matrix
Attachment 5: UAS Network / Desktop Application Strategy
Attachment 6: UAS Centralized "Blade Server" Storage Architecture

Moving Forward:

The external consultants have cautioned that UA is unlikely to have a single enterprise architecture. A more likely outcome will be that UA will have sub-architectures based on MAU strategic plans and layered on a common UA framework.

This consistent framework is essential to be able to obtain an overall picture of the University and allow comparisons between MAUs. If UAS adopts a formal framework that is not adopted system-wide, the UAS will have to reconstruct its architecture from the ground up. Fortunately, this effort has momentum, and it is likely that an EA framework will be selected this calendar year.

In the meantime, there is a lot of work that can be done. The existing UAS artifacts provide a good starting place. These should be further developed and shared with the other MAUs. Likewise, UAS ITS should evaluate architectural artifacts from the other MAUs to determine if these can be adopted locally. Finally, ITS should continue to disseminate artifacts throughout the UAS community in order to encourage internal discussion of IT strategy.

[4] http://www.uas.alaska.edu/provost/docs/accreditation/UASRegEvalF04.pdf

Attachment 1: UAS ITS Mission & Objectives

Mission: Information Technology Services

The mission of IT Services is to help make the University of Alaska Southeast an exceptional place to learn, work and live by providing services and technology responsive to the needs of the university community.

The UAS IT department has four objectives designed to support the UAS strategic plan and PBB goals. These objectives are used to prioritize the allocation of resources and guide the development of new services.

IT Objective I: *Services are **secure and reliable** – users can depend on them*

1) **confidential** data are protected within and between all systems
2) **validity** and **integrity** – users can be assured that information is complete has not been modified
3) **consistency** to support mission critical processes
4) **predictability** to encourage long-range institutional planning

IT Objective II: *Services are **accessible***

1) **available** wherever and whenever it is needed
2) **easy to use**

IT Objective III: *Services are **responsive***

1) **agile** to rapidly adapt to changing needs an opportunities
2) **up-to-date** – users are able to take advantage of current capabilities
3) **flexible** to respect and promote diversity

IT Objective IV: *Services are **educationally relevant***

Designed to support and encourage the AAHE "Seven Principles for Good Practice in Undergraduate Education:"

1. Encourages Student – Instructor Contact
2. Encourages Cooperation Among Students
3. Encourages Active Learning
4. Gives Prompt Feedback
5. Emphasizes Time on Task
6. Communicates High Expectations
7. Respects Diverse Talents and Ways of Learning

Attachment 2: Alignment of ITS Objectives to UAS Strategic plan and UA PBB Goals

Alignment of IT Department Objectives to the UAS Strategic Plan and UA PBB Goals			**UAS IT Objectives** "Services are…"			
UAS Strategic Plan			Secure & Reliable	Accessible	Responsive	Ed. Relevance
Goal 1: Student Success	Objective 1.1: Focus on student learning	Strategy 1.1.3: Provide technology and services which support and enhance learning	X	X	X	X
		Strategy 1.1.4: Expand access to written and electronic information resources	X	X	X	
Goal 2: Faculty & Staff Strength	Objective 2.1: Faculty Development & Research	Strategy 2.1.5: Provide coordinated instructional design and delivery resources for faculty and program development.	X	X	X	X
		Strategy 2.1.6: Assist faculty in integrating technology into instruction that leads to enhanced learning.	X	X	X	X
	Objective 2.2: Staff Development	Strategy 2.2.3: Provide coordinated information technology instruction based on computing resources used for UA administrative and academic support.	X	X	X	
		Strategy 2.2.4: Assist and encourage all staff to integrate technology improvement into campus best business practices.	X	X	X	
UA PBB Goals			Secure & Reliable	Accessible	Responsive	Ed. Relevance
Academic program outcome assessment			X	X	X	X
First-time, full-time undergraduate retention			X	X	X	X
Grant funded research expenditures			X	X	X	
High-demand job area degrees awarded			X	X	X	X
Strategic enrollment management planning			X	X	X	X
Student credit hours			X	X	X	X
University generated revenue			X		X	

Attachment 3: UAS ITS Significant Planned Projects
(excerpted from UAS 2007 Operating Review)

Question G ***Describe any significant IT infrastructure issues your MAU addressed in FY07 and planned projects in FY08 and FY09***

Planned Projects for FY07 and FY08	Secure & Reliable	Accessible	Responsive	Ed. Relevance
Create alert notification (text messaging) system and directly integrate it into the UAS learning management system (UAS Online).		X	X	X
Migrate UAS video production to high-definition standards				
Complete Juneau campus data rewire	X		X	
Complete transition to a mobile computing norm	X	X	X	X
Establish standardized network firewalls for Ketchikan and Sitka campuses	X	X		
Implement standardized data backup and ecryption in Ketchikan and Sitka	X	X		
Implement virtualized servers in Juneau, Ketchikan and Sitka	X	X	X	
Implement storage area networks in Ketchikan and Sitka	X	X	X	
Automate update of UA Enterprise Directory (EDIR) and integrate with UAS business processes		X	X	
Replace campus messaging and calendaring servers	X	X	X	X

Status of Planned Projects Described in the 2006 Review	2007 STATUS
Complete Ketchikan campus telephone transition	*COMPLETE*
Complete Juneau campus data rewire	IN PROGRESS
Expand coverage of network firewall	*COMPLETE*
Transition to a mobile computing norm	IN PROGRESS
Upgrade UAS identity management infrastructure	*COMPLETE*
Migrate to the UA GlobalID standard for computer accounts	*COMPLETE*
Adopt new data backup & encryption strategy	*COMPLETE*
Integrate synchronous Web Meeting technology into administrative / student support environment	*COMPLETE*
Replace campus messaging and calendaring servers	PLANNED 2007
Implement server hardware replacement and centralized storage projects funded in FY06	*COMPLETE*

Attachment 4: Instructional Technology Matrix

UAS Integrated Course Management System: UAS Online

Rev: 8/13/2007

	SYSTEMS											
SERVICES	Base Code	UAS Home	UAS Media	Black board	Library EZ Proxy	Breeze	Elive	UAS Website	ELMO	SLED Live Home work Help	Pub-lisher Sites (ASP)	*Other External / ASP*
Integration/Navigation	X											
Course Web Content	X	X		X							X	X
Audio/Video Content	X		X			X						
Live Presentations							X					
Recorded Presentations			X			X	X					
Photo Gallies	X											X
Application Sharing							X					
Discussion	X			X								
Portfolio	X	X	X			X						
RSS / PODcasting	X		X									
Wikis												X
Live Messaging / Chat	X						X					X
Weblog	X											
Homework Dropbox	X											
Essays/Quiz/Survey	X										X	X
Grade book	X											
Course Evaluation	X											
Full-Text Databases					X			X				X
Reference Librarian								X				
Inter-Library Loan								X				
Online Tutoring								X		X		
Account Self Service									X			

UAS Online Strategy:
A comprehensive course management system must incorporate disparate **systems** and **services.** Traditionally, the systems have operated independently with little integration. Furthermore, the functionality has been branded with the name of the current vendor. This creates substantial confusion whenever the university chooses to change vendors.

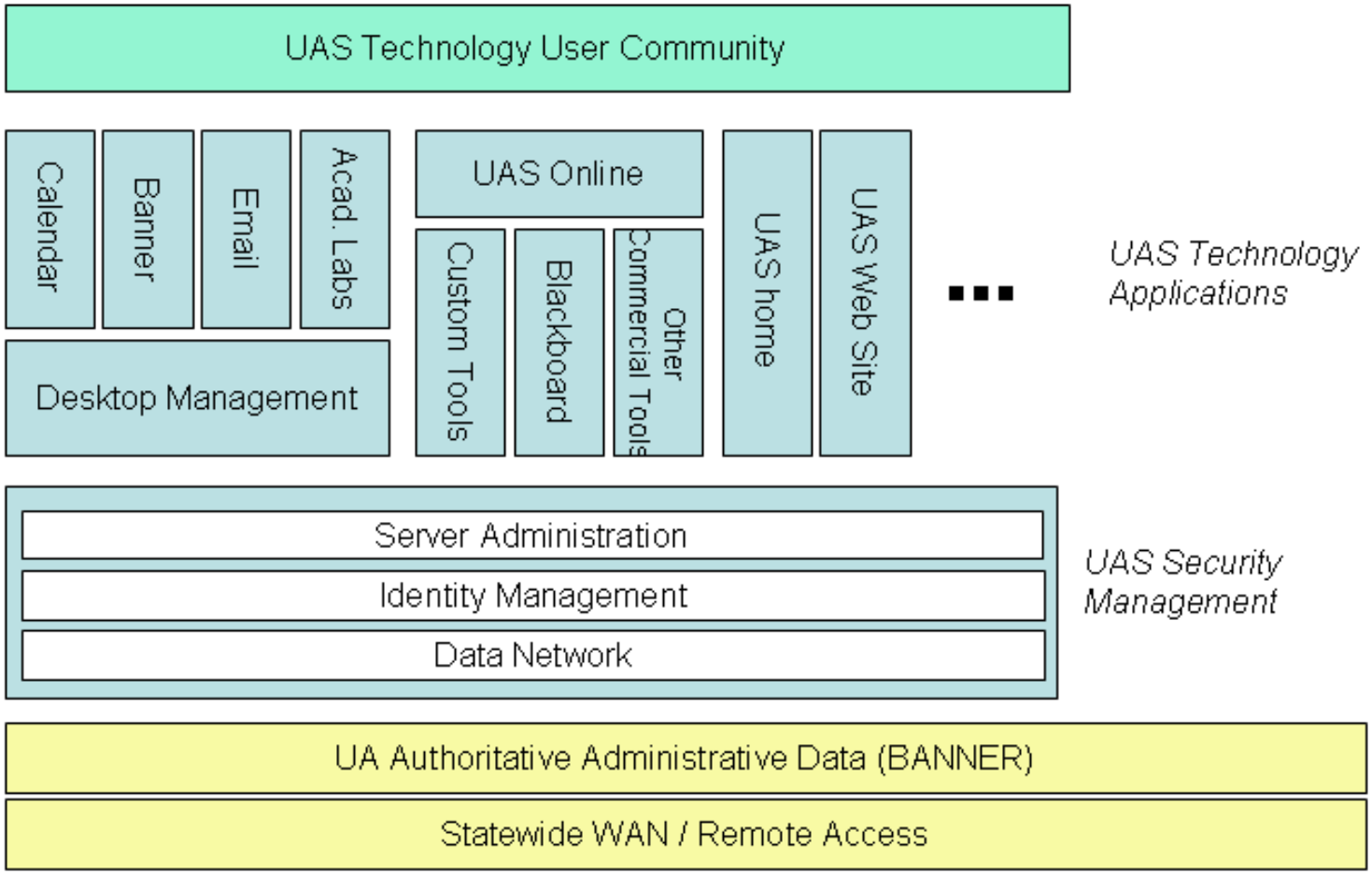
The "UAS Online" strategy seeks to meet the following goals:
Technical Goal: Integrate disparate systems into a single "learning environment" for the students and faculty. Integrated systems share a common navigation, share data, and streamline authentication -- ideally with a "single sign on."

Communication / Marketing Goal: Establish a long-range institutional branding for the diverse services.

Policy Goal: Establish/support institutional and departmental standards for CMS use. Examples: course availability (which courses will have sites) and content (syllabi, grade books).

Attachment 5:

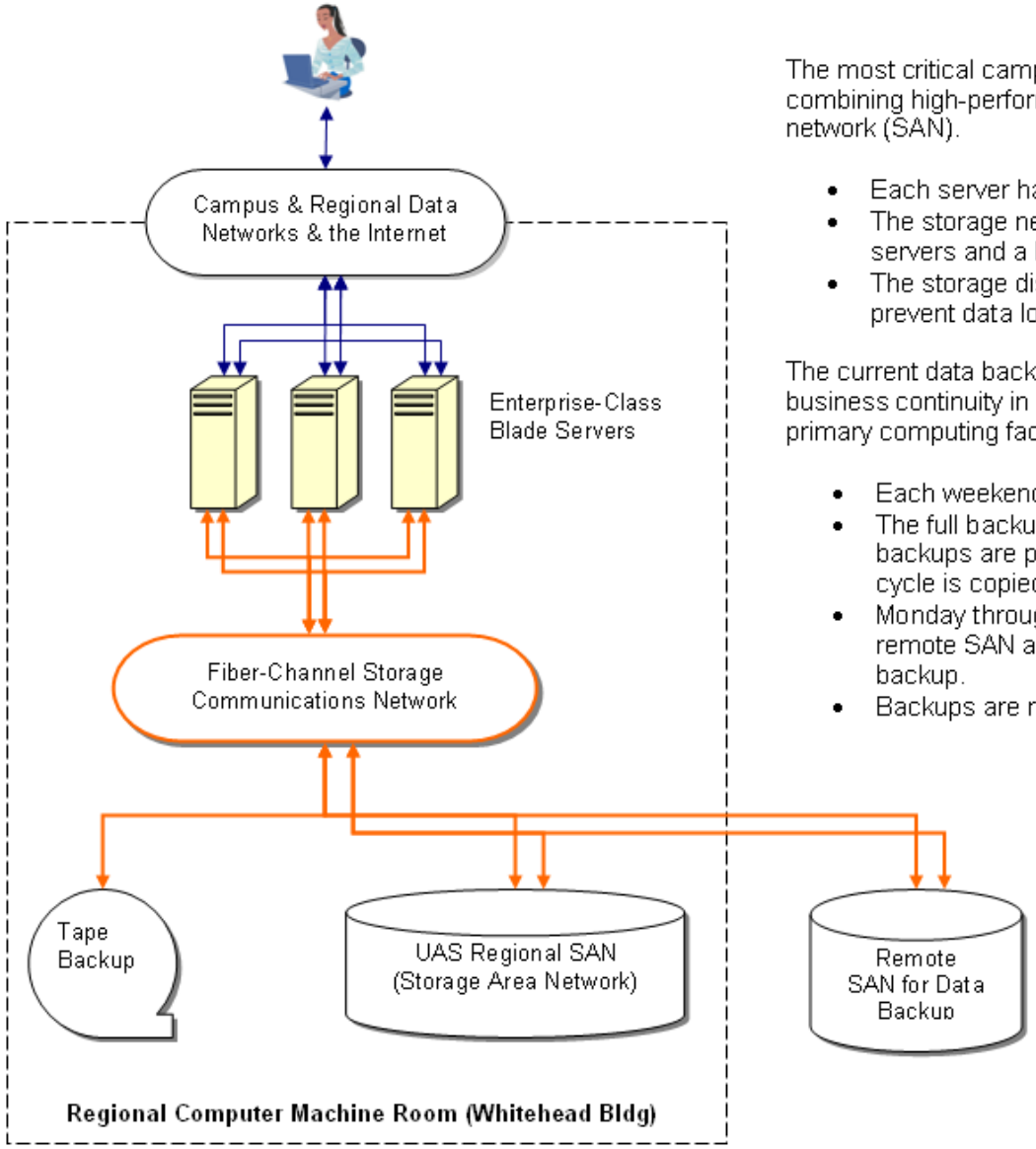
UAS Network / Desktop Application Strategy



Attachment 6:

UAS Centralized "Blade Server" Storage Architecture

Revised: May 23, 2008



The most critical campus technology services are supported by a configuration combining high-performance blade servers with a high-availability storage network (SAN).

- Each server has redundant power supplies and network connections.
- The storage network provides redundant connectivity between the servers and a large shared disk pool.
- The storage disks are configured with sufficient internal redundancy to prevent data loss should any single disk fail (RAID5).

The current data backup strategy is designed to provide data recovery / business continuity in the event of a catastrophic failure, including loss of the primary computing facility.

- Each weekend, a complete copy of server data is created
- The full backups are maintained on a four week cycle. Three of the backups are placed on the remote SAN in another building. The fourth cycle is copied to magnetic tape.
- Monday through Thursday, a "differential" backup will copy to the remote SAN any file that was created or changed since the last "full" backup.
- Backups are retained for four weeks

NOTE: this strategy is not intended to provide long-term archival or "snapshots" of institutional data. The four "full" backup cycles are retained as a precaution against any single backup cycle being corrupt.