2006-2007 :: Architecture and Infrastructure Services

1. Mission Statement:

The AIS unit is committed to provide essential technology infrastructures and services for enterprise level and lesser administrative information systems that enable the University and its students, faculty, and staff to become an outstanding education and research institution.

2. Objectives:

2.1 Design and maintain technology infrastructures and environments required to enable and support information technology services for University constituencies.: Design, configure, construct, and implement server systems and related systems that enable applications to be implemented and utilized. These services include physical infrastructure and security, communications, storage services, backup services, and server management.

2.1.1 Related Strategic Plan Item(s):
II-1 The Education of Leaders; III-1 Dynamic Change Management; IV-1 National and Global Security

2.1.2 Related Institutional Priority Item(s):
SP-1 Double the Size of the Faculty; SP-2 Add 5,000 New Students; SP-8 Reduce Costs; COM-2 Protect Enrollment Gains, Access and Student Quality as part of moving toward Tier One Status; COM-3 Sustain Progress toward Tier One Status in terms of programs, research and faculty quality; COM-4 Enhance research, graduate education and technology-driven economic development; CPT-1 Control enrollment expansion; CPT-5 Increase retention and graduation rates

3. Measures & Findings:

3.1 Analyze status and results of installation reports: Review and assess status reports. Determine that available resources and planned resources provide corresponding growth potential commensurate to actual growth of systems.

3.1.1 Assessment Timeframe: August 2007

3.1.2 Success Criteria:
Increase UPS/PDU capacity by 100% in the main AD Building server center to provide electric power resources for continued growth and evolution of administrative server systems

3.1.3 Related Objective(s):
Design and maintain technology infrastructures and environments required to enable and support information technology services for University constituencies.

3.1.4 Results Related To Success Criteria: Consumption is rising faster than planned supply increases.

3.1.5 Numerical Results: Power consumption has increased from approximately 60% to 80% of existing capacity.

3.1.6 Influencing Factors: Uncontrolled demand for infrastructure services.

3.1.7 Achievement Level: Not Met

3.1.8 Further Action: Yes

3.2 Assess enterprise backup systems installation status reports: Review and assess reports. Determine that backup resources and services are accomplishing current requirements. Determine that backup resources are planned to meet projected service requirements.

3.2.1 Assessment Timeframe: August 2007

3.2.2 Success Criteria:
Enterprise environments are backed up on a basis that supports recovery and restoration needs.

3.2.3 Related Objective(s):
Design and maintain technology infrastructures and environments required to enable and support information technology services for University constituencies.

3.2.4 Results Related To Success Criteria: Server systems and environments requiring back up are backed up daily.

3.2.5 Numerical Results: Backup media is transported off-site 5 days weekly to provide for disaster recovery needs.

3.2.6 Influencing Factors: Business continuity is supported by backup services.

3.2.7 Achievement Level: Met

3.2.8 Further Action: Yes

3.3 Maintain enterprise administrative database engine environments at current technological levels: Install and implement and maintain primary enterprise database engines (DB2 and SQL Server) at states of current

technological maintenance by applying appropriate upgrades and patches on a timely basis e.g. upgrade DB2 V7 to DB2 v8; upgrade SQL Server 2000 to SQL Server 2005.

3.3.1 Assessment Timeframe: December 2007

3.3.2 Success Criteria:
Implement DB2 v8 and SQL Server 2005 and install requisite applications in the environments.

3.3.3 Related Objective(s):
Design and maintain technology infrastructures and environments required to enable and support information technology services for University constituencies.

3.3.4 Results Related To Success Criteria:
Successful implementation of database engines with resultant functionality of relevant applications.

3.3.5 Influencing Factors:
Applications systems interrelationships within database engine environments create complexities that must be fully resolved when installing them in the new database engine environments.

3.3.6 Achievement Level: Partially Met

3.3.7 Further Action: Yes

3.4 Optimize use of database resources:
Applications systems and programs should make effective and efficient use of database resources through the use of optimization techniques in the design and/or program modification processes. Systems and programs should incorporate optimization techniques to effectively utilize local and distributed databases.

3.4.1 Assessment Timeframe: August 2007

3.4.2 Success Criteria:
Compare database utilization statistics of programs before and after changes and database optimization. Database performance and use should improve by a minimum of 10%.

3.4.3 Related Objective(s):
Design and maintain technology infrastructures and environments required to enable and support information technology services for University constituencies.

3.4.4 Results Related To Success Criteria: Finding will be on December 2007

3.5 Improve application systems and program execution times: Modify programs to improve execution time, throughput quantities, and resource utilization

3.5.1 Assessment Timeframe: August 2007

3.5.2 Success Criteria:
Compare execution time and resource utilization statistics of systems prior to and subsequent to modifications. Execution times, throughputs, and utilization of resources should improve by a minimum of 15%.

3.5.3 Related Objective(s):
Design and maintain technology infrastructures and environments required to enable and support information technology services for University constituencies.

3.5.4 Results Related To Success Criteria: Programs have and are being evaluated as candidates for modification by the relevant development groups. Programs that have been properly modified have had improved execution times.

3.5.5 Numerical Results: Modified programs have improved by at least 15% with an apparent average of 25-30%.

3.5.6 Influencing Factors:
Numerous programs and systems exist and each must be evaluated with those offering greatest return on the work investment to be prioritized highest.

3.5.7 Achievement Level: Partially Met

3.5.8 Further Action: Yes

3.6 Systems availability: Availability of enterprise server systems should be at least 99.75% of scheduled targets.

3.6.1 Assessment Timeframe: Each fiscal year

3.6.2 Success Criteria:
Compare actual systems availability with targeted availability and scheduled down times. Actual availability should be at least 99.75% of the target.

3.6.3 Related Objective(s):
Design and maintain technology infrastructures and environments required to enable and support information

technology services for University constituencies.

3.6.4 Results Related To Success Criteria: Targets have been achieved for all major enterprise systems.

3.6.5 Numerical Results:
The enterprise server has experienced no controllable unscheduled down time for the fiscal year.

3.6.6 Influencing Factors:
Modern technology, systems reliability, and scheduling have contributed to systems availability.

3.6.7 Achievement Level: Met

3.6.8 Further Action: Yes

5. Closing the Loop:

5.1 Increase PDU/UPS capacity on an accelerated basis: Pursue additional budget resources to increase capacity of PDU/UPS resources. Limit further uncontrolled growth of server systems by requiring more stringent coordination and planning efforts.

5.1.1 Related Objective(s):
Design and maintain technology infrastructures and environments required to enable and support information technology services for University constituencies.

5.1.2 Related Measure(s): Analyze status and results of installation reports

5.1.3 Responsible Person: D Holmes

5.1.4 Target Date: January 2008

5.1.5 Priority: Medium Priority

5.2 Expand backup services and resources to meet future growth requirements.: Monitor growth of backup service/resource needs. Develop budget requests and other planning factors to assure backup services and resources are sufficient to meet requirements as server systems continue to increase.

5.2.1 Related Objective(s):
Design and maintain technology infrastructures and environments required to enable and support information technology services for University constituencies.

5.2.2 Related Measure(s): Assess enterprise backup systems installation status reports

5.2.3 Responsible Person: D Holmes

5.2.4 Target Date: August 2008

5.2.5 Priority: Medium Priority

5.3 Upgrade enterprise administrative database engines.: Install and implement database engines, maintain them on current technological basis.

5.3.1 Related Objective(s):
Design and maintain technology infrastructures and environments required to enable and support information technology services for University constituencies.

5.3.2 Related Measure(s):
Maintain enterprise administrative database engine environments at current technological levels

5.3.3 Responsible Person: D Holmes

5.3.4 Target Date: December 2007

5.3.5 Priority: High Priority

5.4 Continue to plan and develop systems that function reliably, incorporating redundancies and fail over capabities as necessary.:
Maintain systems at a current state of technology. Maintain good planning techniques. Effectively manage factors that are controllable with respect to systems availability.

5.4.1 Related Objective(s):
Design and maintain technology infrastructures and environments required to enable and support information technology services for University constituencies.

5.4.2 Related Measure(s): Systems availability

5.4.3 Responsible Person: David Holmes

5.4.4 Target Date: August 2007, August 2008

5.4.5 Priority: High Priority

5.5 Continue assessment of systems effectiveness and efficiency: Identify systems and programs that are candidates for modification to optimize performance and utilization of systems resources.

5.5.1 Related Objective(s):
Design and maintain technology infrastructures and environments required to enable and support information technology services for University constituencies.

5.5.2 Related Measure(s):
Optimize use of database resources; Improve application systems and program execution times

5.5.3 Responsible Person: David Holmes, Applications group managers

5.5.4 Target Date: August 2007, August 2008

5.5.5 Priority: Medium Priority

6. Analysis:

6.1 Program/Unit Strengths:

6.1.1 Objectives/Outcomes Exceeded or Met: Backup services and resources are meeting current requirements.

6.1.2 Other Strengths:
Primary enterprise systems availability for the user communities is at or above desired standards due to technology currency, reliability, and redundancies.

6.2 Program / Unit Weakneses:

6.2.1 Objectives / Outcomes Partially or Not Met: PDU/UPS expansion is within original timeframe but latent demand for services is creating a need to accelerate the expansion. Database engine implementations are within planned schedules.

6.2.2 Other Weaknesses:
Requirements for new services consume and exceed staff levels and expertise for database engine support.

6.3 Other Areas Needing Improvement:
Comprehensive planning and control for IT growth on an enterprise basis that includes infrastructure, storage, and backup resources and services.

7. Report:

7.1 Executive Summary:
The AIS unit in Information Resources has been challenged by reorganization and by accelerating growth in latent and direct needs for systems and systems infrastructure support. At various times, demand for services has been at or exceeded staff and resource capacity. The AIS unit has been able to provide services and support that have met the University's significant needs nonetheless.

7.2 Top 3 Program/Unit Accomplishments:
1) The ability of the primary administrative server center to support increasing number of systems has been maintained through renovations and activities that have enhanced the center's infrastructure.

2) Database support levels have increased to meet growing needs of the user community. Two additional database environments, Oracle and MySQL, have been added to the two existing environments, DB2 and SQL Server.

3) Servers and related equipment have been maintained at a state of current technology that has minimized service disruptions due to unscheduled events.

7.3 Public Service:
Staff actively participate in various events that benefit the general public and various groups with special needs. These activities include the Richardson Corporate Challenge/Special Olympics, events sponsored by civic or related organizations such as the American Legion and the Lions Clubs and others.

7.4 Contributions to UTD:
Staff voluntarily participate in various UTD events that contribute to the visibility and public recognition of UTD. Staff voluntarily contribute to endowments and scholarship funds that benefit various students and student groups and academic programs.

7.5 Top 3 Program / Unit Challenges: The AIS unit challenges for the next cycle are

1) Continue to reorganize the new unit into a group that takes advantage of synergies related to the combination staff members possessing related skills and abilities

2) Plan for and maintain servers, storage systems, and infrastructures at a state of current technology

3) Improve service offerings in quantity and quality to the customer base

7.6 Detailed Resources Needed to Improve and Fulfill Mission: In order to maintain services at a level that

reasonably meets demand and expected growth and that will support achievement of the University's mission, the AIS unit would benefit from resource augmentations including a position for database support (Oracle/SQL Server/MySQL), a position for Unix/Linux systems administration, and a position for resource administration directed toward storage management and backup services. These positions would facilitate accomplishment of existing work tasks and would facilitate staff backup and cross-training.

Augmentation of the storage management function would support administrative and academic needs for storage. Augmentation would include acquisition of a SAN device resulting in an additional 6-8 terabytes for the enterprise storage pool and appropriate software enabling effective management of the storage environment. The additional storage and management capabilities are anticipated to meet growth requirements for the next two year contingent on the regulatory environment maintaining the status quo.

Server resources will need to be renewed on a cycle that essentially replaces servers over a three year life span. Growth of server systems will also need to be planned for. Current estimates are that 20-30 servers would need to be replaced annually with 15-20 new servers to be acquired over the next fiscal year.

Server center infrastructure needs must continue to grow to accommodate server growth. Electric power distribution and conditioning will need to occur during the next fiscal year. Electric power resource should be augmented by a 50 kw power distribution unit to support expected growth and provide enough capacity to allow for continued growth over the subsequent 2-3 fiscal years.