

# Imagine Cup 2007 IT Challenge

## Round 2 Case Study

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### Instructions

Round 2 is a case study that you are to read the case study and write a recommendation document that clearly describes which Microsoft technologies and solutions the organization should purchase and implement to meet the requirements of the case study. You are effectively acting as a consultant making a recommendation to the company. Write your answer as if you are providing this proposal to the executives of the organization to read and to understand what you are recommending, and to help the executives understand why you are recommending the solutions you have chosen, and how those solutions will help the organization meet their business requirements.

### Instructions for Submission

When you have completed your recommendation proposal and are ready to submit your materials to the Imagine Cup Judges, do the following:

- Go to <http://www.imaginecup.com/MyStuff/MyInformationTechnology.aspx> to upload the entry.
- Submit your Round 2 entry materials in a Word document (.doc or .docx extension) or a Zip file (.zip extension) in the MY ENTRY section of the page. The Web site will only accept one (1) file for your Round 2 entry. If you need to submit more than one file, then zip the files together and submit the zip file. The maximum size of the submission is 10 MB.
- You can review the file you have uploaded in the MY ENTRY window.
- If you need to change your entry before the deadline, you can submit a new entry file which will replace the existing file. Again, only one (1) file will be accepted. What is in the MY ENTRY window is what the judges will have access to. If you overwrite that file with a new file, the old file will not be available to the judges.
- Your submission must be in English. However there will be no points added or deducted for spelling or grammar. This is not a test of your command of the English language, but rather an assessment whether you understand the case study, and can provide a recommendation that makes sense to the judges.
- Your submission MUST be received no later than 07:00 AM GMT on May 19, 2007

### Round 2 Judging Criteria and Scoring

The Round 2 case study will be scored as follows:

- Meets the proposal requirements: 30%
- Technical feasibility and accuracy of the proposal: 30%
- Justification of the recommendations in the proposal: 30%
- Quality and neatness of the proposal: 10%

## Questions or Clarifications

If you have a question or need a clarification of the materials in the case study, post your questions on the Imagine Cup IT Invitational Forum . All questions will be answered in the forum so that all Round 2 competitors will have the benefit of the same information, answers, and points of clarification.

## Common Points of Clarification

The following information will help you better understand the rules and expectations of the judges:

- Plagiarism will not be tolerated. Do not cut and paste information off of a Website, copyrighted document, or previously published document unless you were the author of the content. Materials submitted that are the works of others in part or in whole will cause the competitor to be immediately disqualified.
- This competition is an individual competition. Each competitor must work alone. Any collaboration with others, sharing of information with others, or accepting help from others will be grounds for immediate disqualification. The intent of this competition is to know what you know, not what somebody else knows and provides to you for your submission
- You may use any reference resources (Web, books, Microsoft TechNet, whitepapers, blogs) to look up information, and you can setup a lab and actually build a network to test your understanding and assumptions as part of your research. However you should not post information, ask questions, blog information, or request information that would specifically invoke a response to your questions. You can effectively read information, but you would not write information that will invoke a direct response to a question. Violation of this research resource point will cause immediate disqualification from the competition
- Do NOT post this case study or any portion of this case study (or even something similar to the case study). This case study should remain in your sole possession for the sole purpose of your reading and responding to the materials of the case study.
- When in doubt, post your questions on the Imagine Cup IT Invitation forum site.

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### Background

Graphic Design Institute ([www.graphicdesigninstitute.com](http://www.graphicdesigninstitute.com)) is a new high technology college. The college offers degrees and classes in a number of IT areas. They are a distance learning based organization, and all classes will be conducted over the Internet. The college will have 125 staff members and 5,000 students. The staff is composed of 100 teachers and 25 school administrators.

The college will leverage technology to deliver the best possible virtual classroom experience to the students. These technologies include:

- Portals for virtual classes
- Conferencing for virtual classes
- Videos and audio for lectures
- Electronic mail, calendaring, and Instant Messaging for Student and Faculty communications
- Virtual lab environments
- Web-based services

These technologies will allow students to interact and collaborate with the faculty and their fellow students in the virtual classroom.

There is one central campus with a data center and 100 staff. There is a secondary campus with a backup data center and 25 staff. The locations are connected to the Internet with DS3 connections. The two locations will be connected with an Internet VPN.

### Scenario

You are the IT Director for the Graphic Design Institute and need to develop the proposal for the college IT infrastructure. The president of the Graphic Design Institute wants to leverage the college's Microsoft relationship and has mandated that the solution be based on the latest Microsoft technologies. The college is just opening and has no existing IT infrastructure, so everything will need to be specified. You will be giving the proposed architecture to the CIO for approval.

The faculty uses laptops for all their work and expects to be able to conduct classes from home via their high-speed Internet connections. The laptops need to be tightly controlled and locked down, as well as managed remotely. The faculty needs to have fully integrated telephony that ensures that their phone calls and voicemails are seamlessly routed to their laptops. Each faculty member will also be assigned a Windows Mobile PDA to ensure that they are available to students via e-mail and IM at all times.

All the students of the college have high speed Internet connections available to them and their systems have Windows XP or better installed. The systems are not controlled by the college, so the decision has been made to use Web services as much as possible. All students will have college e-mail addresses and full calendaring functions. The students will use portal technology for their classes to download the class materials, upload assignments, discuss the class topics, and search for materials. The students will use conferencing technologies to participate in classes, as well as streaming video and audio technologies to view lectures.

Some students will not have access to systems with all the required applications such as Microsoft Word, Microsoft Excel, and Microsoft Access. To assist these students, a farm of virtual servers will be deployed to provide RDP based access to thin-client desktops for up to 10% of the student population.

Some of the classes will require the students to access virtual lab systems, which will be based on virtual server technology. Students will sign up to use these virtual lab systems and access them remotely to setup technology labs.

Security is critical for the college, as it expects to be the target of many hackers. The infrastructure needs to be very secure, be up to date on patches, and deployed with security best practices. Anti-virus, anti-spam, and anti-malware are critical services that the infrastructure must provide to ensure that operations are smooth. The infrastructure should use application level firewalls to ensure that application traffic is controlled. The security officer is concerned that faculty laptops could be stolen and grades altered, so all faculty laptops must have the confidentiality protected and must use two-factor authentication.

Security requires that there be separate regions for staff and students to reduce the possibility of students hacking the internal network. Each of these two regions will include separate networks, servers, and infrastructure. Within the staff region, all communications should be encrypted to ensure that hackers cannot eavesdrop on the communications. All Internet traffic must be secured as well, in accordance with Internet best practices.

The IT department for the college will maintain the infrastructures of both the staff and student regions. To manage the infrastructures in the regions, the IT staff will need systems management to provide automated deployment, inventory, and patch management. The IT staff will also need operations management to provide proactive monitoring and alerting of any potential problems.

The IT department is also very concerned about fault tolerance of the systems in both regions. A key requirement is that all services be fault tolerant and fail over from the primary data center to the secondary data center in the event of a system or site failure.

## Proposal Requirements

All services need to be specified as part of the design. There are no existing services, components, hardware, or software other than the network services (LAN, WAN and Internet). The new services include:

- Application Services
- Backup Services
- Conferencing Services
- Database Services
- Desktop Services
- Directory Services
- File Services
- Infrastructure Services
- Messaging Services
- Mobility Services
- Perimeter Services
- Portal Services
- Print Services
- Security Services
- Systems and Operations Management Services
- Thin-client Desktop Services
- Video Streaming Services
- Virtual Lab Services

The proposal must include an architectural design of what products and servers should be installed and how they should be configured. The proposal must include a specification of how the products and technologies meet the requirements. The proposal should also include a diagram of the proposed architecture and a list of all the products in the design.

## Deliverables

The deliverables for the proposal include:

1. Proposal (3 to 15 pages)
2. Architectural Diagram (1 or more diagrams)
3. List of Microsoft software in the proposal