

CWRU ITS Project Definition

Project Name:

WAN Project

A. Purpose and Goals:

- 1. Define the business problem or opportunity being addressed.*
- 2. Describe in broad terms how it will be addressed.*
- 3. Identify which divisional strategic objectives will be supported by this effort.*
- 4. Identify any related goals or deliverables that are outside the scope of this project.*
- 5. List the outcomes that would indicate successful project completion.*

- 1.** As a result of a recent Internet-2 test requiring high-speed network bandwidth, the University now has redundant network connection to its ISP (OARnet).
- 2.** To eliminate the cost of redundant links to the Internet, and to position CWRU for future bandwidth needs, a migration from the original OC-3 connection to the recently acquired, higher-capacity OC-12 link is proposed. The transition to OC-12 will make a higher-capacity firewall system necessary. As part of this project, an improved Intrusion Detection System (IDS) will be implemented which will help prevent unauthorized access attempts resulting in significant loss of available bandwidth.
- 3.** The primary strategic objective supported by this project is the one pertaining to **Infrastructure and Access**. Since this project also supports goals which require communication and collaboration with organizations and individuals outside the University, it also supports
 - The Advanced Technology Commons initiative;
 - The Community Enterprise Portal initiative; and
 - The Communications and Customer Support Services initiative
- 4.** None.
- 5.** This project will demonstrate successful completion when (1) the new connection and associated systems are operational, and (2) when CWRU is no longer paying for its current OC-3 connection to OARnet, and (3) when port scanning and similar intrusion attempts no longer cripple CWRU's internet connection.

B. Basic Plan:

- 1. List the major project phases and their deliverables, including important project milestones.*
- 2. Describe how the project will be integrated into ongoing operations and what support will be required.*

1. Project phases will be (1) Planning/Design; (2) Implementation of OC-12 hardware, firewall system, and IDS; (3) Operationalize connection and systems, and (4) Post-conversion review. Major milestones for each project component include

OC-12 Project

- Successful connection between CWRU and OARnet using OC-12 blade
- Replace OC-3 connection to OARNET with OC-12 connection
- Separate commodity Internet traffic through Packetshaper
- Disconnect old OC-3 connection

IDS Project

- Install and configure new Cisco IDS 4250 appliance
- Install two new Windows 2000 management stations to manage appliance
- Configure IDS to implement basic security policy (block known attacks)
- Configure IDS to detect port scans
- Configure IDS to issue blocks for port scans on CWRU's 7507 router, with the idea of eventually moving these to one of the Cisco 6500 series switches used for the OC-12 connection
- Publish list of automatically-blocked off-campus machines on the web
- Publish list of manually-blocked on-campus machines on the web
- Publish statistics concerning IDS appliance's non-port-scan activity on the web

Firewall Project

- Develop deployment plan for new firewall
- Install and configure demo Cisco PIX firewall appliance (PIX 535)
- Move existing Firewall-1 rules, services, and object definitions to PIX 535
- Replace existing Firewall-1 firewall with PIX 535
- Order and receive new PIX firewall blade for Cisco 6500 series switch
- Install and configure new PIX firewall blade
- Replace PIX 535 appliance with firewall blade

2. Integration:

The engineers responsible for the current OC-3 connection will transition to the OC-12, with similar scope and responsibility;

The engineers responsible for the Firewall-1 firewall will transition to the PIX

firewall, with similar scope and responsibility;

The IDS management tasks have been added to the security engineer's duties.

C. Customers and Stakeholders:

- 1. Who are the project's customers and what are their needs and expectations?*
- 2. What important customer-specific issues must be addressed?*
- 3. Who are the other stakeholders and how will this project impact them?*

1. The customers for the WAN project include every person and organization on campus who require reliable connectivity to the Internet, both commodity and Internet-2. This includes students, faculty, and staff. Individual user needs are too broad to include in this overview.

2. The most important issues are: Internet connectivity and its reliability, and the minimization of network disruption.

3. Other stakeholders include affiliates who will eventually connect to the Internet via CWRU's OARNET connection – in effect, CWRU will be their ISP and responsible for guaranteeing some level of service.

D. Required Schedule:

- 1. When must implementation be completed?*
- 2. When must all post-implementation tasks be finished?*
- 3. List the required completion dates for any deliverables that are needed for other projects or activities.*
- 4. When must this project begin in order to meet these deadlines?*

1. This project should be completed by May 2003.

2. Post-implementation tasks should be completed by July 2003.

3. N/A.

4. This project began in October 2002.

E. Required Resources:

- 1. What resources (people, capital, and expenses) are needed to produce the required deliverables by the due dates?*
- 2. Describe any outside resources that will be required.*

1. Personnel: Approximately four full-time ITS personnel, primarily concerned with system installation, configuration, interoperability, and management.

Equipment (refer to the WAN Concept diagram):

- 2 new Cisco 6500 series switches and associated equipment
- Gigabit-capable firewall
- Gigabit-capable IDS appliance
- OC-12 blade for Cisco 6500 switch

- 2 IDS management computers with appropriate network connections
 - 100 Mbps or 1 Gbps link between Crawford and KSL
2. Coordination is required with:
- OARNET, to physically switch the Internet link from the OC-3 to the OC-12 and to provide any necessary space in their POP;
 - AFS and ICG, to guarantee that we have a physical fiber path on which to run the OC-12 link;
 - Switch and Data, to ensure that we have space to put any needed equipment in their POP

F. Project Issues, Assumptions, and Interdependencies:

1. What significant issues must be resolved for this project to succeed?
2. List any major assumptions made when formulating how project goals will be met.
3. How do other current or anticipated projects affect this project?

1. The contracts between CWRU and AFS and CWRU and ICG must be enacted before the fiber path may be legally used. OARNET must resolve any technical issues with using our OC-12 connection and their existing routing equipment.
2. We assume that the contracts will be enacted, that any necessary OC-12 connection equipment will be available, and that OARNET will work speedily to give us the OC-12 connection to test thoroughly before we cancel the OC-3.
3. This project depends on the switched gigabit network upgrade to enable users to take full advantage of the bandwidth available via the OC-12 connection.

This is a single project with three discrete components. As a result, there are several intra-project dependencies. For example: the PIX firewall blade needs to be installed one of the Cisco 6500 series switches used for the OC-12 connection; the IDS appliance needs one of the 6500 series switches to block port scans; the PIX firewall blade needs the OC-12 connection to operate at its rated bandwidth.

While each component is individually valuable (and could be implemented separately), all three work together to provide the solutions this project as a whole is intended to provide.

G. Major Risks:

1. Identify significant project risks.
2. Explain how you plan to manage each of these risks.

1. Risks include availability of funds for equipment to make use of the OC-12 connection and the compatibility of network equipment from CWRU's preferred vendor (Cisco) with the Juniper router used on the OC-12 link by OARnet.

Other broadly-described risks and their contingencies include:

- Cisco hardware performing as advertised – open case with Cisco TAC for

support and resolution

- Interoperability between the IDS and Cisco 6500 switch – Cisco TAC
- Interoperability between the PIX firewall blade and Cisco 6500 switch – Cisco TAC
- Available funding beyond current equipment requirements – enlist ITS management support
- Ability to use the Packetshaper (which is only capable of 100 Mbps) on a link with higher bandwidth – shape only commodity Internet traffic, which is capped at 45 Mbps
- Ability to effectively split the commodity Internet and Internet-2 traffic – enlist OARNET's assistance
- OARNET having the necessary equipment to support implementation – possibly provide them what they need on a temporary basis

2. (Included inline.)

H. Accountability and Management:

- 1. Identify the person who is responsible for this project, and will drive it to completion.*
- 2. Identify the person who will manage the day-to-day project activities (if different from the person who is accountable).*

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