Faculty/Staff E-mail Performance Remediation

Problem Statement:
A steadily increasing volume of “SPAM” e-mail along with the continued growth of e-mail as a preferred communication medium has outgrown the processing capacity of Cal Poly’s existing Faculty/Staff e-mail server.

The PolyComm implementation of the Oracle Collaboration Suite (OCS) has been designed to address the longer-term requirements for messaging services as well as the fundamental hardware and software requirements, and the original plan is well into implementation design and development. However the critical nature of the current unpredicted demand, SPAM traffic per se, and related performance concerns require that we act now, even if we face possibly radical and at times “band-aid type fixes” to do so.

Factors Contributing to Performance Problems in Order of Impact:
1. Large volume of SPAM
   • Using a trial version of the SPAM software we are moving to purchase we have preliminarily identified that roughly 50 percent of incoming e-mail can be categorized as SPAM.

2. Large number of concurrent logins, particularly when a large number of unread messages exist in individuals Inboxes
   • One of the largest processing loads on the system occurs when a large group of users login and process e-mail at the same time. Having a large volume of new e-mail in users’ Inboxes severely compounds the problem. For each new message in a user’s Inbox, the message header must be downloaded to the user’s local workstation when they login. When there is a larger volume of new messages, such as the day after a weekend or long holiday, and a large group of users login at basically the same time (8:00 a.m.), it creates a processing backlog, which the current server is not able to recover from during normal processing hours.

3. SPAM traffic during the business day
   • As additional SPAM is delivered throughout the day, this simply compounds the problem as the server struggles to catch up from the morning spike and process normal e-mail along with this additional 50 percent increase in traffic.

4. E-mail address harvesting from Websites
   • Users are targeted for SPAM e-mail in a number of ways but one of the key techniques “SPAMMERS” use are automated programs to harvest e-mail addresses published on Websites.
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ACTION PLAN  

We have reviewed the current e-mail system in detail to identify key short-term steps to remediate the severe performance condition now existing. These options have been reviewed with AACC last Monday, 12/8 as well.

Below are the immediate steps we are taking and the other parallel efforts still under evaluation to address the identified impacts to our current Faculty/Staff e-mail system.

Steps Taken/Expected Result:

1. Removed Faculty/Staff Index page linked off of the Cal Poly home site that was a text based list of e-mail addresses for all Faculty and Staff. An on-line Faculty/Staff Directory will replace this functionality in early January in a “non-harvestable” format.
   • Over time, this will help reduce the number of SPAM messages Cal Poly receives by reducing the ability of others to harvest Cal Poly’s e-mail addresses.

2. Upgraded software on the gateway servers used to scan all incoming mail for viruses. This upgrade not only allows enhanced virus scanning but also supports SPAM filtering software. When the upgrade was complete ITS was able to install a trial version of the SPAM filtering software. ITS is currently moving forward with an immediate purchase of the necessary annual licenses to provide SPAM filtering capability at the campus/user level ($25K). Using the trial version ITS is currently monitoring SPAM and determining appropriate system settings and configuration.
   • This is viewed as the first step necessary to provide Cal Poly users with an effective mechanism to filter out SPAM e-mail while reducing the e-mail processing load. Various policy issues will need attention if and as this action takes hold.

3. Configured e-mail gateway to reset e-mail connections from sources sending a message to a large volume of Cal Poly recipients at one time as this is a trait of some SPAM traffic.
   • This step will not stop such e-mails in aggregate from being delivered but will slow and delay the delivery of such messages to avoid huge spike loads for the e-mail server to deal with.

4. Increased the number of e-mail delivery and routing processes on the Faculty/Staff server to the maximum number recommended by the OpenMail vendor.
   • These additional e-mail processes will allow other avenues for e-mail processing. However, because each of these processes requires CPU overhead, the performance increase provided by this modification is not expected to be significant.

5. Increased priority for local e-mail delivery
   • Previously e-mail coming from outside Cal Poly was given an equal priority to internal e-mail being sent between Cal Poly users. With this change, internal e-mail now has a higher priority and will be given precedence over external e-mail. This
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will ensure that internal e-mail delivery will not suffer as severely due to periods of heavy external traffic from SPAM.

Other Steps Being Taken:

1. Moving forward with purchase of enterprise wide SPAM filtering software ($25K). Order was placed the week of 12/8 with full implementation on the weekend of 1/11/04.
   a. Once software is installed, the subject lines will immediately begin to be marked to notify users of potential SPAM e-mail. This step will not impact the required e-mail server processing, but will help users better identify SPAM e-mail. Target: week of 12/15.
   b. SPAM folders will be created for each Faculty/Staff e-mail server user. Target: week of 1/5.
   c. All identified SPAM will be forwarded to the user’s SPAM folder instead of their Inbox. When a user then logs in, the headers for identified SPAM e-mail will not be automatically downloaded with the other new messages. This is expected to result in a measurable performance increase. Isolating these SPAM e-mail messages will also provide users and system administrators with a more effective means to deal with it. Target: week of 1/12.
   NOTE: This will also require user education and possibly policy-based review of SPAM filtering “rules”, etc., so users can effectively deal with the messages stored in this new folder. For example, if users immediately go to this SPAM folder when they login in the morning, the impact would be the same as if the messages had been sent to their Inbox.

2. Identifying which individuals use the auto-forward feature to forward their e-mail to other e-mail services or sources. There are two ways of accomplishing this forwarding, a user may set it through their e-mail client on the e-mail server or it may be set through the Personal Information Channel of the Cal Poly portal. If set on the server each forwarded message is processed by the e-mail server twice, once on the way in and once on the way out. If set in the directory through the portal, the e-mails are forwarded prior to ever reaching the Faculty/Staff e-mail server, therefore completely eliminating any processing load for this server. Target: week of 12/8.

3. Educate users on steps they can take to help alleviate pressure on the e-mail system (See “Faculty/Staff E-mail Suggestions” attached to be used with the first page of this document to educate Faculty and Staff on the issues).

4. Identify high volume users for potential transfer of these users to the more powerful Student machine to offload processing from the much more impacted Faculty/Staff server. These moves would require a disruption of service for each of these users as well as modification of their clients to point to the new server. These moves would also create other issues and potential problems for these users and those trying to communicate with them. Therefore, other options will be attempted prior to moving to this more extreme measure. Target date for identifying high volume users: week of 12/8.
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5. Identifying funding ($25K-$50K) and resource requirements necessary to implement a new, more powerful HP server as an interim measure until the new e-mail system is in place and operational. This cost would be completely “throw-away” once the new OCS system is in place, as all HP servers will be decommissioned at that point. Additionally, this is quite an intensive effort and would delay the implementation of the new mail system by a number of months.

6. Evaluate an acceleration of the Oracle Collaboration Suite (OCS) for Faculty and Staff to the Spring ’04 quarter.

Secondary Potential Action:

Should the above actions not provide acceptable performance improvements, more drastic measures would be required. Prior to moving forward with measures four or five above (transferring users to the Student e-mail server or purchasing a new Faculty/Staff e-mail server) ITS recommends taking a step to stop all potential SPAM at the e-mail gateway. This would eliminate all SPAM e-mail processing at the Faculty/Staff e-mail server level and would provide a significant performance improvement. This solution is not being pursued immediately as it is more intrusive to Staff and Faculty requiring them to login to a separate system to review their potential SPAM e-mail. With this solution there would again be policy implications and a need for further policy review and action.

Also, this would require additional funding for consulting support to provision accounts for all Faculty and Staff at the e-mail gateway level (estimated at $15K).
Faculty/Staff E-mail Suggestions

To help alleviate, or at least not further compound the performance problems of the current Faculty/Staff e-mail system, and to more fully engage all impacted users we are expanding our efforts to provide specific awareness and defensive practices for all Cal Poly Users to set realistic expectations for how we can more effectively get through this current difficult situation.

Here are a few things ALL OF US should consider to help and to keep in mind:

• The first day back after a weekend or after an extended holiday is going to be the most difficult for the e-mail system to handle due to the accumulation of e-mail during the period users are away, so be aware of this and be most cognizant of your use of the system at these points in time. (Referred to as HIGH IMPACT days below)

• Avoid using your Cal Poly e-mail for personal uses, e.g., to forward jokes, recipes, or other personal messages

• Consider using other means of communication such as the telephone wherever possible and appropriate, particularly on HIGH IMPACT days

• To the extent possible, avoid sending messages to large groups of people on HIGH IMPACT days, particularly in the morning

• If you need your e-mail forwarded to an external e-mail address, set this forwarding through the Cal Poly portal (my.calpoly.edu) Personal Information Channel (on the Grades & Personal Info tab), which will forward the message before it reaches the Faculty/Staff e-mail server. Setting the forwarding through your e-mail client will cause the e-mail server to process the message twice, once coming in and once going out

• Avoid posting your e-mail address on Web sites to eliminate the possibility that the addresses may be harvested off of these Web sites for SPAM purposes.

• Do not reply to messages from unknown sources to “remove” yourself from their mailings, in many cases this simply serves to verify to the source that they have a valid e-mail address and may result in an increased volume of SPAM messages.