CALIFORNIA EDUCATIONAL DATA PROCESSING ASSOCIATION

THE DATABUS

"Serving California's Public Education Technologists"

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Elk Grove Goes for Voice, Video and Data in Every Classroom

Technology: Enhancements require standards for effective implementation.

Charles Burns, Elk Grove Unified School District

In April of 1994 when our superintendent asked me "... what would it take to put a phone in every classroom?", I thought it was pretty much a rhetorical question. With the aid of some previous experience with putting phones and data cabling in entire sites before, we set about to estimate the job. Within a couple of months we came up with $3.5 million. I went back to our superintendent with this number, fully expecting to get laughed out of the office. What I got was the opportunity to sell the project to his cabinet, the district's finance committee and finally the board of education. They all bought it, and now we have to deliver.

Due to our bond election passing in 1986 and the subsequent recession, construction costs were less than anticipated. There's enough left over to fund this project and a few others. In November of 1994, the left over bonds were sold and now the money is "in the bank".

The most recent experience we had with this was our Classroom Teacher Support System (CTSS) which completely networked one year round middle school and put a mixture of Macintosh and Windows PCs in each classroom. We provided electronic mail, mainframe access (for attendance), grade reporting and "works" software for every teacher. This project provided us with a successful model for the rest of the school district. The last 3 schools constructed which were opened last fall all have the same setup, a fiber optic backbone with twisted pair to each room and office.

Even with this level of experience, we felt uncomfortable just going out and spending $3.5 million without at least checking with our user community. Consequently, we drafted our "Telecommunications Standard" which defines all the wire services that we plan to deliver to each classroom and office. Such things as voice mail, Internet access, mainframe access, cable television and interactive distance learning are all covered in this standard. This document went before technology committees, principals' councils and the superintendent's cabinet, revised at

(See "Elk Grove" on Page 10)

In This Issue:

CEDPA Information

CEDPA is an association of Educational Data Processing Professionals (technologists) within the State of California. Founded in 1960, the major emphasis of the association's activities are directed towards improving Administrative Information Processing in public education within the State of California and to prepare its membership to better meet and support the technological needs of the Instructional Program.

CEDPA is a California non-profit corporation, as recognized by the Internal Revenue Service.

As cited in CEDPA's bylaws, the purpose of this organization shall be:

(a) To provide information to the California public educational community concerning educational data processing via dissemination at an annual conference and through periodicals and special interest seminars.

(b) To foster the exchange of knowledge of educational data processing concepts, systems and experiences between educational data processing installations and other associations both at the state and national level.

(c) To inform the association membership of important information concerning educational data processing.

(d) To provide recommendations to the State Department of Education, State Legislature, school districts, County Offices of Education and other public educational organizations concerning educational data processing.

(e) To develop professional standards for the Educational Information Systems Community within the State of California.

Yearly membership in CEDPA is granted to attendees of the Association's annual conference. Individuals interested in the Association's mailings may request to be added to CEDPA's mailing list by writing to the address below.

The DataBus is published bimonthly by the California Educational Data Processing Association and is distributed without charge to all members of the association and to other selected individuals within the State of California that are interested in information systems processing in education. *The DataBus* is also published electronically on the Internet. CEDPA's home page URL is http://www.nmusd.k12.ca.us/CEDPA/Cedpa.html. All correspondence and address changes should be sent to:

CEDPA
P.O. Box 6552
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Statewide Initiatives May Affect MIS Departments of School and County Agencies

Standardization: Guidelines proposed for network infrastructure and budgeting.

Phillip W. Branstetter, Riverside County Office of Education

Two statewide initiatives which are, or should be, of particular interest at this time to the technology community are the long-awaited RFA for building a statewide network infrastructure, and the progress toward a standardized accounting code structure. Each of these initiatives is supported by the California Department of Education and has high visibility. Either or both of them could have significant impact (positively and negatively) on district and county office technology planning.

The RFA is a grant of $600,000 from ECTL administered by the Orange County Department of Education on behalf of CDE. The grant process will identify a lead LEA (school district or COE) to partner with other educational agencies (K-12, higher education, consortiums, non-profits, etc.) and private industry to implement a statewide networking plan supporting Internet access, information services, and "educational content" data servers according to the guidelines and parameters described. The RFA has been released and responses are due to OCDE by May 22, 1995.

COEs have basically banded together under the CCSESA (California County Superintendent's Education Services Association) umbrella to respond in unity to the RFA with a statewide plan emphasizing coordinated regionalized services based on the county regions—which coincidentally neatly correspond to LATA boundaries in California. Skip Sharp (San Diego County Office of Education) is the chair of the Telecommunications/Technology Task Force's sub-committee charged with developing the CCSESA response. The Telecommunications/ Technology survey recently distributed to COEs by the Task Force (again a sub-committee effort, in this case chaired by Kathleen Barfield) will be used as a primary source to identify the state of readiness of individual COEs to participate in the network infrastructure. Ultimately this RFA could be the first step in sanctioning a common communications vehicle for assimilation and transmission of data for a variety of applications for both instructional and administrative purposes. It will be interesting to see what, if any, consortiums other than CCSESA forward RFA responses and how the statewide information server and connectivity strategy evolves.

The second issue of note is the development of a standardized account code structure pursuant to SB 94. In a March 27, 1995, CDE memo we understand that a draft account code structure exists and a discussion phase is beginning. The proposed structure (see related article elsewhere in this issue) is based on Federal guidelines. This basis, implied from the beginning as a priority consideration, makes logical sense as a starting point. Ernst and Young conducted a survey to reasonably examine implications to LEAs of converting to the standardized account code structure proposal. The budget implications for a statewide implementation have been estimated to be as high as $15 million.

The standardized account code structure project is at a pause and review point. While it is not a foregone conclusion that the structure will be implemented, nor does a timeline exist, it is certainly a strong possibility that we will have a standardized account code structure for education in California by the year 2000. At this point CDE has complied with SB 94 by submitting a proposed structure to the Legislature. If implementation is mandated and funded, indications from CDE are that it would be over a period of years. Initially a few (2 or 3) COEs would pilot the conversion and results for a year. A second phase of volunteer COEs and districts would follow in a subsequent step to validate and build on the experience of the pilots, and then the plan for conversion (or cross-reference implementation) of remaining existing systems would be fully developed.

This is vaguely reminiscent of the minimum day attendance legislation in the sense of scope and impact on data processing. However, there is much more momentum for data standardization among systems in general today (it is an aggregate "cost of doing business" issue) and there's fundamental logic behind a standardized account code structure. CDE is also obviously aware of the practical issues, costs and general trauma associated

(see "Iniatives" on Page 12)

MANAGEMENT BULLETIN 95-04

March 27, 1995

TO: County and District Superintendents of Schools
County and District Chief Business Officials
County and District Data Processing Managers

FROM: J. Richard Whitmore, Deputy Superintendent
Local Fiscal Services

SUBJECT: UPDATE ON THE STATEWIDE STANDARDIZED ACCOUNT CODE STRUCTURE

It has been slightly over a year since we last communicated with you about the requirement for us to develop a statewide standardized account code structure (see Management Advisory 94-01, dated January 28, 1994). As you may recall, SB 94 (Chapter 237, Statutes of 1993) provided for the development of a standardized account code structure for school districts and county offices of education, as well as a plan for conversion from the accounting and budget structure currently used.

We now have a draft account code structure, prepared with our consultant Ernst & Young. Please be aware that we consider this document to be a draft, and fully expect and encourage a continuous in-depth review and discussion of issues and concerns surrounding the details and philosophy spelled out for the new structure. As we identify and resolve issues through ongoing discussions and pilot testing, we will continue to modify the structure and the definitions as necessary to ensure the development of a comprehensive, well-planned standardized account code structure.

We are sending a copy of the document to every county office of education, as well as to each member of our Advisory and Technical Committees. Although we would like to be able to send a copy of the draft structure to every school district, budget constraints unfortunately prevent us from doing that. However, we are making the document available on the Fiscal Crisis and Management Assistance Team (FCMAT) bulletin board system (BBS) and on the Internet, and we encourage you to access it via these telecommunication vehicles.

The FCMAT BBS modem access number is (805) 636-4126. Look under "News," "Calif. Dept. of Ed.," for the file location. Files will also be available through the Internet at the California Department of Education's anonymous FTP site (goldmine.cde.ca.gov) in the /pub/Fiscal directory.

Status Report

The draft account code structure that we are now disseminating is the result of many discussions among the members of our 13-member Advisory Committee and our much larger (over 70 members) Technical Committee, as well as communications with others of you who have expressed interest in and concern about ensuring that the structure and coding is reasonable and viable. The proposed structure is consistent with the federal guidelines spelled out in the 1990 edition of Financial Accounting for Local and State School Systems, otherwise known as the Federal Handbook, and conforms to Generally Accepted Accounting Principles (GAAP) and Government Accounting Standards Board (GASB) policies.

Although there are unresolved issues related to the account code structure that must yet be addressed, we believe that the current proposed structure provides a logical, well-organized, and comprehensive chart of accounts that is flexible enough to accommodate local needs. The structure is comprised of six (6) fields of accounts, with the need for an accounting system that has the capacity to assign twenty-two (22) digits. This minimum is needed to meet all federal and state reporting requirements; however, we recognize that the number of digits may not be sufficient to meet your needs as a school district or county office of

education. If that is the case, you may choose to add sub-fields and sub-accounts for local discretionary purposes and to track revenues and expenditures for special projects. The draft account code structure can be expanded to allow for these additions at the local level.

One of our goals in developing and implementing a new account code structure is to eliminate certain financial reports to the state; ideally, financial reporting will become a by-product of the new structure. In addition to eliminating reports such as the J-200 (financial report), the Matrix, and other financial reports required for federal and state

(See "Structure" on Page 6)

Structure

(Continued from Page 5)

categorical funds, we also hope to eliminate the Program Cost Accounting Report (Form J-380). Please be aware that the issue of program cost accounting has not been addressed in this structure. It clearly is a significant component of our current financial reporting system, and has generated much discussion in our meetings; however, we have not reached a solution as to how to best

address program cost accounting. Future discussions will focus more on this entire issue, which must be resolved before the structure is finalized.

In addition to requiring the development of an account code structure, SB 94 also directed us to prepare a plan for conversion to the new structure from the accounting and budgeting structure currently used by school districts and county offices of education. Toward that end, Ernst & Young has conducted a comprehensive survey of county offices and school districts designed to solicit information about your current account code structure, your system capabilities, office staffing, training programs, and possible conversion costs. The information generated from this survey is now being analyzed and will be incorporated into a statewide plan for eventual conversion to the new account code structure.

Current and Future Plans

We are continuing to meet with both our Advisory and Technical Committees to identify and resolve problems and/or inconsistencies. As we clarify issues, we will modify the structure and the definitions as necessary, refining the document in such a way as to make it as understandable and as "user-friendly" as possible.

At this point in time there are a few school districts and county offices of education that have volunteered to pilot the new structure in the 1995-96 fiscal year. We believe that this field testing will help in identifying areas that need to be corrected or refined, thereby paving the way for a smoother conversion. If your school district or county office of education is interested in piloting the new account code, please be sure to contact us so that we can include you in any future communications related to the pilot project.

As spelled out in SB 94, the California Department of Education is to submit the proposed structure and plan for conversion to the Legislature and the Department of Finance. The Legislature's intent was for the Governor to consider funding for the plan for conversion in developing the Budget Bill for the 1995-96 fiscal year. Although this may no longer be a realistic timeline, we will nonetheless be presenting the proposed structure to the Legislature, along with a recommended plan for conversion, within the next few months.

For now, we ask that you review the draft structure and let us know of any questions or issues you would like to discuss. Please feel free also to contact any member of the Advisory Committee or the Technical Committee (see enclosed lists) to convey your thoughts, ideas, and concerns. We firmly believe that the successful development of a standardized account code structure depends upon an open exchange of information and ideas with those affected by or interested in this endeavor. Please be sure to discuss the proposed structure with other staff members within your organization, with your peers in other school districts and county offices of education, and with anyone else you think might be interested and have a particular point of view. Your thoughtful ideas and suggestions will ensure the success of this important project.

Your questions, concerns, comments, and suggestions related to the statewide standardized account code structure should be directed to Maria Fong or Janet Sterling at:

Mail or FAX:
560 J Street, Suite 170
Sacramento, CA 95814
FAX: (916) 322-1465
Internet e-mail:
mfong@smtp.cde.ca.gov
jsterlin@smtp.cde.ca.gov

Should you have questions about the information in this bulletin or about the standardized account code structure, please contact Maria or Janet at (916) 322-1770.

JRW:JSe
Enclosures

I. Overview of the Standardized Account Code Structure

This supplement to the California School Accounting Manual presents a Standardized Account Code Structure for use by school districts and county offices of education. The standardized structure has been developed to accomplish several key objectives:

- To establish a uniform, comprehensive, minimum chart of accounts statewide to improve financial data collection, reporting, transmission, accuracy and comparability.
- To reduce the administrative burden on local educational agencies (LEAs) in preparing required financial reports.
- To meet federal compliance guidelines and increase opportunities for California to receive federal funding for education programs.
- To ensure school districts and county offices of education comply with generally accepted accounting principles (GAAP) and Governmental Accounting Standards Board (GASB) principles.
- To create a logical framework which can be used to determine where education funds come from and how they are used.
- To provide better information for use by administrators, parents, board members, legislators and others interested in school finance.

The Standardized Account Code Structure contains five numerically-coded, mandatory fields and one field that will be required to be built into the structure, but its use is not mandated:

1.	FUND/GROUP	2 digits
2.	RESOURCE (Project/Reporting)	4 digits
3.	PROGRAM GOAL	4 digits
4.	FUNCTION (Activity)	4 digits
5.	OBJECT	4 digits
	SCHOOL - NOT MANDATED	4 digits

Local education agencies may include additional sub-fields in their chart of accounts and/or expand the number of digits in each field, but must utilize these fields and the accounts described in this supplement. **Exhibit I-1**, on page 3, provides definitions for each of the six fields. **Exhibit I-2**, on the page following Exhibit I-1, provides the layout of the standardized structure and some guidelines to help users as to the decision process in classifying transactions. **Exhibit I-3**, on page 5, shows how the standardized structure should be used for revenue, expenditure or balance sheet transactions. The remainder of this supplement provides a chart of accounts with detailed account numbers, names and descriptions for each of the six fields, and several examples of how to use the standardized structure.

Excerpted from a document distributed by the Califonria Department of Education

STANDARDIZED ACCOUNT CODE STRUCTURE

FIELD DESCRIPTIONS

FUND/GROUP (2 digits)

FUND

- A fiscal and accounting entity, with a self-balancing set of accounts recording cash and other assets, all related liabilities, and residual equities and balances, or changes therein.
- Established to carry on specific activities or attain certain objectives of an LEA in accordance with special regulations, restrictions, or limitations.
- Applies to revenue, expenditure, and balance sheet accounts.

ACCOUNT GROUP

- A self-balancing group of accounts established to account for fixed assets of an LEA; or established to account for the unmatured general debt of an LEA.
- Applies to balance sheet accounts.

RESOURCE (Project/Reporting) (4 digits)

- Used for accumulating revenues and expenditures to meet various specialized reporting requirements of local, state, and federal agencies and internal reporting needs of an LEA.
- Tracks categorical activities, e.g. ESEA, Chapter 1.
- Designates restricted and unrestricted source of funds in General Fund.
- Applies to revenue and expenditure accounts; may be used in balance sheet accounts.

PROGRAM GOAL (4 digits)

- Accumulates costs by instructional goals and objectives of an LEA.
- Groups costs by population, setting, and/or education mode.
- Allows the charging of program costs (instructional costs and direct support costs) to the benefiting program goals.
- Provides the framework for accumulating the costs of different Functions by program goals.
- Designed to accommodate capture of financial information by subject matter and/or mode of education.
- Includes the option of a 0000 code for functions which are not directly assignable to a program goal.
- Applies to expenditure accounts; may be used in revenue accounts.

FUNCTION (ACTIVITY) (4 digits)

- Applies to expenditure accounts; may be used in revenue accounts.
- Describes activities or services performed to accomplish one or more items in the Program Goal field.
- Describes the activity for which a service or material object is acquired.
- Consists of activities which have somewhat the same general operational objectives.

OBJECT (4 digits)

- The service or commodity obtained as a result of a specific expenditure; the general source and type of revenue; or a balance sheet account.
- The primary revenue classification differentiates local, state, and federal revenue sources; revenues from restricted sources are further classified using the Resource (Project/Reporting) field.
- Used to generate financial statements.
- Applies to revenue, expenditure, and balance sheet accounts.

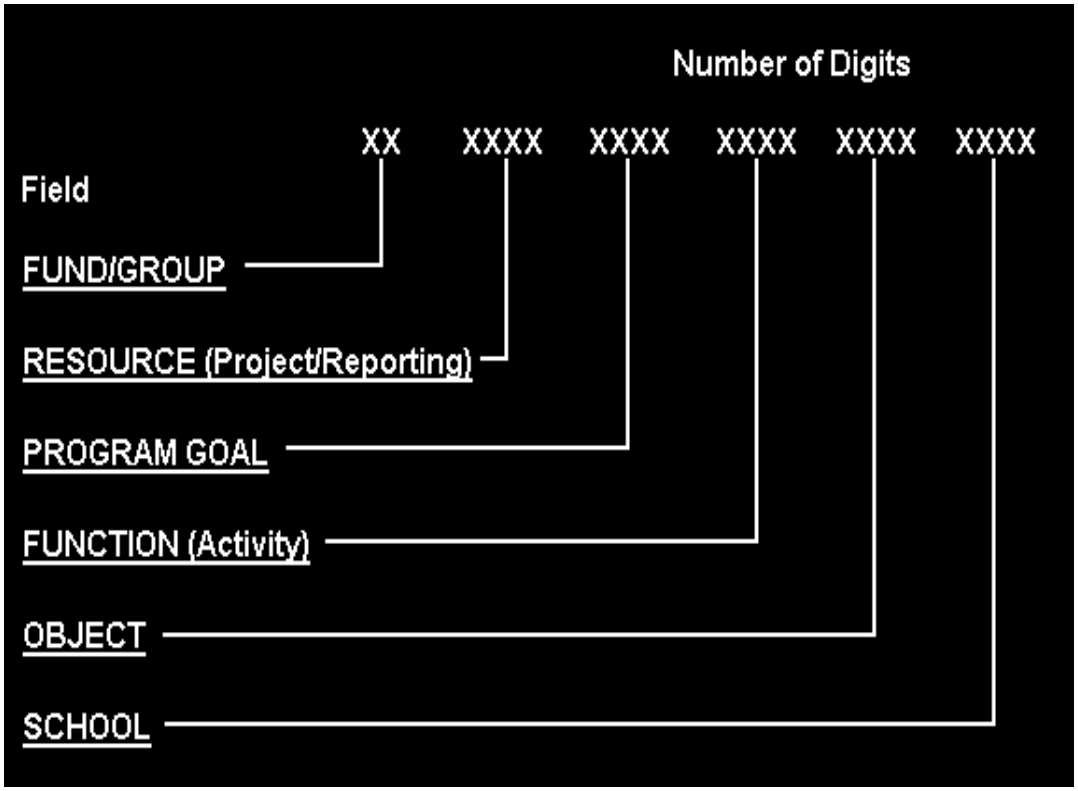
SCHOOL (4 digits)

- Designates a specific, physical school structure or group of structures which form a campus as identified in the California Public School Directory.
- Unit under a principal's responsibility for which a unique set of test scores is reported.
- Includes a generic districtwide site or clearing account to capture costs not readily assignable to a particular site. The costs in this account may be distributed back to the school sites.
- Applies to expenditure accounts; may be used in revenue accounts and balance sheet accounts.
- While the field is mandated, reporting to the state at this level is not mandatory. Counties and districts should, however, build into their systems a capacity for use of this field in the future.

Excerpted from a document distributed by the Califonria Department of Education

Layout For

Standardized Account Code Structure



To understand the relationship between fields of the Standardized Account Code Structure, consider the following questions when classifying a transaction such as an expenditure.

FUND/GROUP:	*Which account* is used to *administer* education expenditures?
RESOURCE (Project/Reporting):	Where have the funds come from? What is the categorical project or restricted *revenue source*?
PROGRAM GOAL:	*Why* was the expenditure made? What *broad purpose* does it serve?
FUNCTION (Activity):	*How* will the expenditure be used? On *what activities or services* will funds be spent?
OBJECT:	What specifically is being purchased? On *what particular items* will the funds be spent?
SCHOOL:	Where will the funds be spent? What *location* benefits from the funds?

Excerpted from a document distributed by the Califonria Department of Education

Yolo County's Project HAWK

Workshop: Teachers and administrators participate in technology learning experience.

Lauri Bailey, Yolo County Superintendent of Schools

"Out of the entire Coalition of Essential Schools Conference, your HAWK Program stands foremost in my mind and I felt compelled to write you. You and your teaching colleagues brought a song to my heart as I saw what hands-on involvement/care and service oriented teaching can do for a student's self-esteem about their education. Bravo to you, Ms. Bailey and all involved in making your program a success. We at Irvington were so impressed." (Jeannette Frechou, Educator, Irvington High School).

Ms. Frechou was writing in response to her experience during a two and a half hour interactive workshop attended by teachers, administrators, and Apple Computer, Inc. executives, during which participants experienced first hand the power of technology as a tool for interweaving education and service to communities as a potent force in educational reform. What is remarkable about this workshop experience is that the *colleagues* referred to were students. And not just any students, but students from four Community and one Continuation High School who comprise Project HAWK (Habitat Alliance and Wildlife Keepers).

Project HAWK is a CalServe service learning partnership that involves youth in meaningful community projects designed to have a positive impact on the community, students academic progress and their own sense of self worth. The project began with the restoration of a wildlife sanctuary on Cache Creek in Yolo County. The existing partnership between Yolo County Superintendent of Schools, the Yolo County Flood Control and Water Conservation District and Woodland Community High School was joined in 1995 by Apple Computer, Inc. as part of Apple's Partners In Education grant program. The addition of state of the art technology added a dimension to service learning which has put Project HAWK and its Alternative Education Programs at the forefront of efforts to interweave education, business and technology into a curriculum which prepares youth to transition effectively into the world of work.

Working closely with MicroComputer Training and Support Specialist James Summers, of the Information and Technology Services Department, the students and staff designed the workshop to demonstrate the ability of students to learn a complex application such as Macro-Media's Director 4.0 with a short (3 week) time frame, utilize the multimedia application Hyperstudio as the teaching context, and model quality coaching techniques to workshop participants as they developed a Hyperstudio stack within the workshop time frame. The result in the words of Van Schoales, Director for the Bay Area Coalition of Essential Schools was *the most talked about session of the Conference*.

At first glance, the relationship between a technology support division, whose primary focus has been the "nuts and bolts" of Educational District data and business support services, and an educational program that is often the last stop for students ousted from traditional educational programs may seem a far stretch. However, the combination of skilled technical experience and raw student creativity provides the perfect context for mentoring relationships that enable youth to experience, in an adult forum, the relevance of the technological abilities to their current educations and later job opportunities. In both education and business, the training and experience in practically applying multi-media concepts and transferring that knowledge to clients in an efficient, enjoyable and effective manner are highly desirable employee traits.

The collaboration has produced a new interdepartmental working relationship, where the strengths of education and technology support services can be blended to enhance both departments. The model is the basis for future projects that include the development by students of Internet home pages for the Yolo County Superintendent of Schools and planning for a summer workshop for educators seeking training in integrating technology and service to the community across the curriculum. Coaching staff will, of course, include experienced students.

Perhaps more important though are the human relationships that have developed. The students and staff of Instructional Services are no longer numbers on a page, and the personnel in the Information and Technology Services are "real" people rather than nameless machines. There is a clearer understanding of the mission of both

(see "Yolo" on Page12)

Speaker Update

Skip Sharp
San Diego County Office of Education

In the last newsletter, it was mentioned that the selection of speakers this year would be based on topics of importance to our members. The following is a list of potential topics breakout sessions. Please take a moment to review the list. If there is a particular topic that you want covered or one that you don't think is of benefit, or if there is something that you think is missing, please call our speaker chair, Skip Sharp at 619-292-3539, or send him e-mail at **hsharp@sdcoe.k12.ca.us**. The potential list of topics is as follows:

ICTL what can it do
Cable TV as a data carrier
California Student Information Services (CSIS) update
California Department of Education network update
Internet use policy
Networking Issues (roundtable discussion)
Wiring a facility (roundtable)
Retirement planning session
Telecommunication trends and issues
How to structure bids—pitfalls/successes
Internet security
Internet successes/failures
Networking Topologies Frame relay/vs ISDN etc.
Standardized account code structure
Telecomm standards—the impact of (AB3141)
Internet in a box" (roundtable)
Grant writing—how to write a successful/unsuccessful grant
Computer acquisition—clones vs name brands pros&cons (roundtable)
How to train/sustain a work force issues (roundtable)
Outsourcing issues—"Are you a candidate?" pros/cons
Client server issues —how to discover the issues and costs before deciding to implement
Microcomputer maintenance success/failure stories - school to work
Tech forum— switched ethernet, Juke box technology, ATM fast ethernet, wireless, teleconferencing

Please provide your input as soon as you can so that we can do the best job of providing topics of relevance for you.

Elk Grove

(Continued from Page 1)

each step. We are now confident that we will be delivering the appropriate technologies with the money allocated.

The next thing we had to do was come up with a schedule. We were forced into a maximum time fame of 36 months by the bond sale rules. Since we have 33 schools to retrofit, this means starting one every month and an average expenditure rate of $100,000 per month, easy to do, but not easy to do correctly. We came up with a "point system" that assigned a certain number of points to each school in each of several categories. The categories were things like "Cost to maintain existing phone system", "Capacity of existing system", "Network Hub", etc. With this fairly objective scheduling, it was pretty easy to get our principals to accept our proposal. We did make some adjustments based on "security". Some of our schools feel strongly about getting phones into classrooms so that teachers working outside normal school hours would have a way to call 911 in case of emergency.

We have just completed the engineering on our first retrofit school and the job is now out to bid. Engineering of the second school has begun and it looks like we're going to have to do multiple schools simultaneously, just to meet our established schedule. It's going to be a long three years.

We have copies of our Telecommunications Standard, Acceptable Use Policy, Engineering Specifications model and other documents available if anyone is interested. They're online at **http://www.egusd.k12.ca.us** for Internet users; others can give me a call at 916-686-7710 if you're interested in receiving a copy.

Charles Burns is Director, Information Systems for Elk Grove Unified School District and a former CEDPA Director.

CEDPA Is On The World Wide Web

CEDPA now has a "home page" on the World Wide Web. This home page includes introductory information about CEDPA as well as links to the current board of directors and contact information. *The DataBus* is also published electronically on the Web. CEDPA's home page is at URL:

http://www.nmusd.k12.ca.us/cedpa/cedpa.html

Internet Access:More Do-It-Yourself Solutions

Software: A "free" Unix and Windows NT 3.5 Server enhance Internet connectivity.

Addison Ching, Newport-Mesa Unified School District

As some of you might recall, I took a "Do-it-yourself" approach to Internet connectivity for our district. I assembled a 486dx-50 computer and licensed and installed the SCO Unix operating system on it to act as our domain name service machine. Our Web Server is on a 486dx2-80 PC computer running the Windows NT Server operating system. Our Gopher and E-mail servers are both running on a Macintosh IIci. Only the SCO Unix software had to be licensed for use; the other server packages are freeware or shareware and can be used either free of charge (in the educational setting) or by paying the author a modest registration fee. SCO Unix is closely related to the form of Unix commonly known as SVR4 (System V, Release 4) developed by AT&T.

This approach has inspired other agencies to take a similar, economical approach to Internet connectivity. The crew at Huntington Beach Union High School District has gone one step further by using a different Unix operating system developed by the University of California, Berkeley, called Berkeley Unix (or BSD Unix). Look for a future article in T*he DataBus* from the HDUHSD crew, describing their experiences with their Internet startup.

A hybrid of Berkeley Unix called **FreeBSD Unix**, is available free of charge for PCs. FreeBSD Unix is a very robust implementation of Unix. While there are some differences between BSD Unix and SVR4, most of the features required for TCP/IP support are implemented. Most importantly, FreeBSD provides full E-mail and Domain Name Service (DNS) support. Since many colleges and universities run Berkeley Unix on Sun workstations, much of the software that runs at those sites will run on a PC using FreeBSD Unix. This includes Web, Gopher, Mail and News servers.

Obtaining the package can prove to be a novel experience. An Internet-capable computer is required to obtain a startup disk image and a program to create the startup diskette from the site that contains the sotware, FTP.FREEBSD.COM. Once this is done, the target Unix computer can be created entirely from this startup diskette. The startup diskette creates a basic Unix shell on the target computer, then allows the remaining system to be automatically downloaded via FTP from the software archive or obtained from a variety of other sources including DOS floppy, FTP from an alternate site, QIC tape, or CD-ROM. The entire FreeBSD software package and documentation is available on a Walnut Creek CD-ROM for about $40.

Hardware requirements for FreeBSD include any 386dx or 486 computer with at least 4mb of main memory, a large (> 200 mb) hard disk and a supported network interface card (NIC.) Most common NICs are supported including 3com 3C503-9, SMC Elite 16, and any NE2000-compatible card. Documentation for FreeBSD Unix is online in the form of Unix *manpages.* Information for all supported Unix commands and services is available through the manpages.

As a comparison to the SCO Unix machine, a computer running the FreeBSD Unix operating system was added to the Internet support servers at our district. This computer now acts as one of our secondary Domain Name Service computers for the nmusd.k12.ca.us domain (each domain must have a primary name server and at least one secondary name server in order to be registered.) Implementation was relatively painless, especially with the availability of the online manpages.

On another note, the new version of Windows NT, version 3.5, supports remote access (dialup) services. Upon reviewing the documentation, this access includes full PPP (Point to Point Protocol) support, so any client that is PPP-capable can access the Internet remotely if the Windows NT server is an Internet node. On the Macintosh, this includes any computer with MacTCP and MacPPP. On the PC, any Windows computer using Trumpet Winsock v2.0 or greater can be used. While the Windows NT **workstation** 3.5 operating system only supports a single remote access client, the Windows NT **Server** 3.5 operating system can provide support for up to 256 PPP clients (if it were possible to connect that many dialup ports to the computer.) Up to 32 dialup clients can be easily supported by using two 16-port multiport cards such as those manufactured by DigiBoard. This 486-computer/Windows NT Server 3.5/DigiBoard combination could prove to be a reasonable alternative to several off-the-shelf remote access solutions such as those provided by Asante and Shiva.

Initiatives

(Continued from Page 3)

with major changes such as this (particularly acute given the plethora of systems utilized in the state) as their approach to the requirements of SB 94 demonstrate. Now is the time to take a look at the draft. It's available either on the Goldmine server (FTP goldmine.cde.ca.gov) or on the FCMAT BBS, and evaluate the impact on your system and give CDE feedback. CEDPA will again present an update session, from CDE staff, on the progress of the standardized account code initiative at the fall CEDPA conference.

Yolo

(Continued from Page 9)

departments along with the skill and energy that is expended to meet each one's objectives. The result is the much sought after "win win situation" for the students, educators, staff and community served by the Yolo County Superintendent of Schools.

Lauri Bailey is the Project HAWK Coordinator for the Yolo County Superintendent of Schools. James Summers is a MicroComputer Training and Support Specialist.

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