Accredited Standards Committee
X3, Information Processing Systems*

X3T9.2/91-111

DOC. NO.: SPARC/FIISG-91-0010

Date: 8 July, 1991
Project: 794
Ref. Doc.: N/A
Reply To: Paul P. Fessler
NCR Corporation SDC-4
1700 South Patterson Blvd.
Dayton, OH 45479
Phone:(513)445-5017

To: Distribution

Subject: Fault Isolation Information Study Group (FIISG)

From: Paul P. Fessler, Acting-Chairman

The purpose of this letter is to make your technical committee aware of the existence of the Fault Isolation Information Study Group (FIISG), our scope and program of work, and request a summary of your activities regarding Fault Isolation or Characterization Information.

Because of the global nature of our study and the difficulties we've had obtaining information through normal research methods, I felt it necessary to contact the chairman from each technical committee within X3 and request their assistance in gathering this information. We would appreciate the summary to include any work completed, in progress, or planned to be done in the future. Just a short note, photo copy, etc. to acknowledge receipt of this letter. Even just a note that says, this does not apply to our efforts. ***Your inputs would be appreciated prior to August 10, 1991.***

This information will be used by our group to determine if there are any parallel or related work efforts and assist us in determining to what depth this subject has been addressed by other groups. Your information along with the information provided by the other technical committees will have a definite impact on the study group's recommendations to X3/SPARC. Therefore, any assistance your committee, sub-groups, and work groups can provide would be appreciated.

*Operating under the procedures of the American National Standards Institute
X3 Secretariat, Computer and Business Equipment Manufacturers Association (CBEMA)
311 First St., NW, Suite 500, Washington, D.C. 20001-2178
Telephone: 202-737-8888 (Press 1 twice) FAX: 202-638-4922 or 202-628-2829

475

We believe the problem analysis process includes two major elements. The first and primary element, which is the focus of our group, is a real-time detailed description of the problem; a precise problem characterization. This is the information the study group believes should be accumulated during the detection process and links detection with analysis. Since it is real-time information, it also reduces the need to recreate the problem with labor intensive diagnostic utilities. The second element is a knowledge base of problem solutions. Knowledge bases are vendor specific implementations and not within our scope.

However, these two elements would be used in conjunction with one another to provide, a third element; also not within our scope, a recommended solution to a problem. The characterization data would be compared with the data stored in a knowledge base. If there is a match, an accurate recommended solution could be provided from the solutions stored in the knowledge base. In the event of no-match, the fault characterization data could be passed to a remote location for further analysis. This analysis could be done by either electronic equipment, additional knowledge bases, or by human subject matter experts.

The study group would appreciate any information you and your colleagues could provide regarding related efforts internal and external to X3. I have included a summary of our third meeting, to provide a snap shot of where we are at this point in time.

*Operating under the procedures of the American National Standards Institute
X3 Secretariat, Computer and Business Equipment Manufacturers Association (CBEMA)
311 First St., NW, Suite 500, Washington, D.C. 20001–2178
Telephone: 202–737–8888 (Press 1 twice) FAX: 202–638–4922 or 202–628–2829

X3/SPARC - Fault Isolation Information Study Group Meeting - Raleigh, NC

The meeting in Raleigh was very productive. We all left with the feeling, we had accomplished a great deal of work in two days.

Meeting Summary

Summary of my Opening Remarks to the group; -- **Our goal** is to document, in the form of a proposal to X3/SPARC, a cooperative and logical approach to fault isolation. -- **The goal is attainable,** advances in technology in the past decade have made it all possible. -- It will also **free up resources within the industry**. These resources can be used to provided the customer with other products and services for the purpose of enhancing customer productivity; **"Solving Customers' business problems."** -- **The X3/SD-3 document provides the format/** outline we need to follow. Some of the outline information is easily put on paper after our thoughts are documented. -- I proposed we address only those topics requiring detail, therefore, **I have consolidated our work to ten topics.** -- If there **are no volunteers, assignments will be made by the chairman.** We also need to establish a goal for the draft and the final edited version to be completed. -- **I emphasized the importance of commitment** to the project and the need for regular attendance at study group meetings. Per X3/SPARC regulations, lack of attendance could jeopardize the representative's voting privileges, and impacts the credibility of the study group's efforts.

ELECTRONIC BRAINSTORMING SESSION - USING -- IBM TEAMFOCUS:
An introduction to the IBM Decision Support Center was provided by Linda Thompson. The application featured special software that permitted rapid building of a knowledge base, equal participation by all study group members, anonymous exchange of ideas and voting, and a permanent record of the session.

EXCEPTION EVENT FAULT ISOLATION INFORMATION
Study group members initially provided input on 5 basic categories of fault isolation information:

General Information
Hardware Information
Software Information
I/0 and Communications
Other

The group began a general refinement of the categories. A distinction was drawn between the message content, and the message delivery and handling mechanism. However, the message delivery and handling mechanism are considered to be *beyond the initial scope of this study group*. The consensus developed for a fault message which contains consistent minimum information (e.g.:

General Event Information
Time and Date the exception occurred
Originator
Vendor Id (Class & Model)
Geographic location
Severity level
Sequence Id (for tracking purposes)
Category (software, hardware, micro code, environment, etc.)

as well as "flexible" fields for carrying error description, status & return codes, environment & configuration information, and additional diagnostic data.

Exception Event Tailored Information

Human Interface specific
Language specific
Application specific
Configuration Specific
Operating System specific
Micro-Processor
Micro-Processor Bus Specific
Central Processor specific
Memory Specific
Backplane Specific
Direct Memory Access Specific
System Bus specific
Host Adapter Specific
Input/Output Bus Specific
Device Controller Specific
Device Interface Specific
Device Type Specific
Device Specific
Technology Specific
Vendor specific
Medium specific
Field Repairable Specific
Structure specific
Module specific
Communications device Specific
Communications line Specific

The contents of these fields are defined by the category of product reporting the error. This also provides for a system standard which is flexible to handle new technologies. Note; not every Exception Message will contain all the categories listed above. If approved, a technical committee will provide the required detail for the event tailored information.

BENEFITS

The group spent time looking at Costs/Benefits to the Customer, Vendors and Industry. Information collected during the brainstorming session was condensed, and the group voted electronically and prioritizing the top benefits in each segment - Customer, Vendors and Industry. Following is a summary of that prioritization:

Benefits to customer

- Increased availability/reduced interruptions
- Better coordination between service vendors
- Lower service expense (lower product expense)
- Less involvement in problem isolation (better use of resources)

Benefits to vendors

- Reduced product support resource requirements (parts,people,skills)
- Increased customer satisfaction
- Expanded product/services market place
- Increased development Productivity

Benefits to Industry

This category generated much discussion. The resulting top three priorities were:

- Reduce service/support complexity and costs
- Increased competition leading to improved products & services
- Greater promotion of Open Systems Architecture(s)

The study group completed activities by evaluating the Teamwork tool and the Decision Support Center. It was agreed that the day had been exceptionally productive.

WORK ASSIGNMENTS (proposal topics champions) ***Volunteers***

Each individual is tasked with generating a rough draft of their section. Drafts should be concise, factual, and where possible make reference to detailed data which can be included in an

appendix. Drafts should be forwarded to Tom Wilson prior to August 12, 1991, for inclusion in a working document to be reviewed at the meeting on August 27-28, 1991.

- Need(s) and/or Problem(s) **H.Moreno**
- Expected Stability of Proposed Standard or Technical Report with Respect to Current and Potential Technological Advance. **C.Haring**
- Definition of Concepts and Special Terms (if any). **J. Knott**
- Recommended Program of Work. (Group effort.) **H. Moreno**
- Impact on Existing User Practices and Investments. **T. Wilson**
- Impact on Supplier Products and Support. **H. Peterson**
- Technical and Costs for Compliance Verification. **B. Bowman**
- Closely Related Standards Activities. **P. Fessler**
- Resources - Individuals and Organizations Competent in Subject Matter. **P. Fessler**
- Existing Practice in Area of Proposed Standard or Technical Report. **P. Fessler**

JEANNE C. ADAMS X3J3 CH
NATL CTR FOR ATMOSPHERIC RES

JERRY J. ANDERSEN X3L2 CH
IBM CORPORATION

MEL BARUTHA X3B8 CH
VERATEC INC. DATA RESOURCE GROUP

CHARLES E. BISS X3A1 CH
PHOTOGRAPHIC SCIENCES CORP

PETER R. BONO X3H3 CH
PETER R. BONO ASSOCIATES INC

DAVID BOWEN X3J17 CH
QUINTUS COMPUTER SYSTEMS INC

JIM BRODIE X3J11 CH
MOTOROLA INC SEMICONDUCTOR PRODUCTS SECTOR

WILLIAM CARLSON X3B7 CH
MAXTOR CORPORATION

DON R. DEUTSCH X3H2 CH
GENERAL ELECTRIC CO

ALICE DROOGAN X3B10 CH
MASTERCARD INTERNATIONAL

W. F. EMMONS X3S3 CH
IBM CORPORATION

GARY FEUER X3B6 CH
US NAVY

JERROLD S. FOLEY X3T5 CH
ELECTRONIC DATA SYSTEMS CORPORATION

RICHARD G. FOOTE X3T2 CH
GTE CORPORATION

KENNETH J. HALLAM X3B11 CH
ENDL ASSOCIATES

JAMES HARLE X3J2 ACTING CH
US NAVAL ACADEMY COMPUTER SERVICES

MOREY HENDERSON X3T6 CONVENER
LOGISTICS MANAGEMENT INSTITUTE

WILLIAM KENWORTHEY JR X3L8 CH
US DEPT OF DEFENSE

JOHN KLENSIN X3J1 CH
MIT ROOM N52-457

GARY A.P. KOHLS X3J12 CH
EFFECTIVE MANAGEMENT SYSTEMS

BRUCE LEASURE X3H5 CH
KUCK AND ASSOCIATES

DMITRY LENKOV X3J16 CH
HEWLETT PACKARD CO

JOHN B. LOHMEYER X3T9.2 CH
NCR CORPORATION M/S 07

ROBERT F. MATHIS X3J13 CH
CONTEL CORPORATION

GENE MILLIGAN X3T9.5 ACTING CH
SEAGATE TECHNOLOGY PO BOX 12313

DELL ODDY X3B9 CH
MOORE BUSINESS FORMS, MOORE RESEARCH DIVISION

ELIZABETH D. RATHER X3J14 CH
FORTH INC

GARY D. RAYMOND X3J15 CH
INFOPRO INC

DON SCHRICKER X3J4 CH
WANG LABORATORIES INC

DELBERT L. SHOEMAKER X3T9 CH
DIGITAL EQUIPMENT CORPORATION

RICHARD STEINBRENNER X3B5 CH
AT&T CORPORATION, BELL LABS ROOM 2A-152

EDWARD L. STULL DBSSG CH
SUMMA INTERNATIONAL INC.

LINDA SUSKIND-GREEN X3T18 CONVENER
IBM CORPORATION

HELMUT E. THIESS X3K5 CH
1834 LAMONT STREET NW

DONALD TOLMIE X3T9.3 CH
LOS ALAMOS NATIONAL LABS

CHARLES F. TOUCHTON X3L3 CH
IBM CORPORATION, IMAGE APPLICATION SYSTEMS

THOMAS TURBA X3J9 CH
UNISYS CORP

C. W. WILSON X3J7 CH
MARTIN MARIETTA CORP

A. JERRY WINKLER X3H4 CH
CTA INC

LAUREN WOOD X3T4 ACTING CH
ALLIED SIGNAL AEROSPACE CO

JACK S. VEENSTRA X3T3 CH
AT&T CORPORATION, ROOM 1N-255