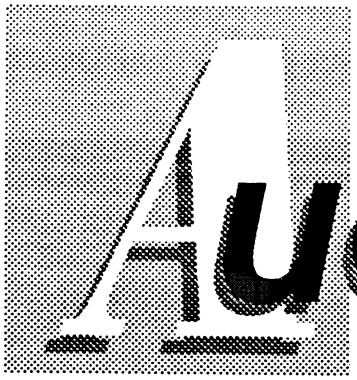

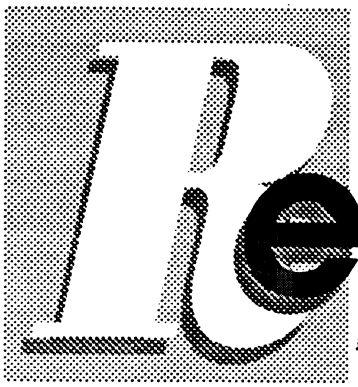

OFFICE OF THE INSPECTOR GENERAL

DEFENSE INFORMATION SYSTEMS AGENCY MANAGEMENT OF TROUBLE TICKETS FOR ELECTRONIC COMMERCE/ELECTRONIC DATA INTERCHANGE

Report No. 97-010

October 28, 1996

Department of Defense

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Acronyms

ANSI	American National Standards Institute
CSC	Customer Service Center
DISA	Defense Information Systems Agency
DLA	Defense Logistics Agency
EC/EDI	Electronic Commerce/Electronic Data Interchange
FACNET	Federal Acquisition Computer Network
NEP	Network Entry Point
VAN	Value-Added Network

INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
400 ARMY NAVY DRIVE
ARLINGTON, VIRGINIA 22202-2884

October 28, 1996

MEMORANDUM FOR DEPUTY UNDER SECRETARY OF DEFENSE
(ACQUISITION REFORM)
DIRECTOR, DEFENSE INFORMATION SYSTEMS
AGENCY

SUBJECT: Audit Report on the Defense Information Systems Agency Management of Trouble Tickets for the Electronic Commerce/Electronic Data Interchange (Report No. 97-010)

We are providing this audit report for your review and comment. Management comments on a draft of this report were considered in preparing the final report.

Management comments on the draft report conformed to the requirements in DoD Directive 7650.3. As a result of management comments requesting redirection of recommendations, we redirected Recommendation 3. to the Deputy Under Secretary of Defense (Acquisition Reform). We request that the Deputy Under Secretary of Defense (Acquisition Reform) comment on the recommendation by January 6, 1997.

We appreciate the courtesies extended to the audit staff. Questions on the audit should be directed to Ms. Kimberley A. Caprio, Audit Program Director, at (703) 604-9210 (DSN 664-9210) (e-mail *KCaprio@DODIG.OSD.MIL*) or Mr. Kent E. Shaw, Audit Project Manager, at (703) 604-9228 (DSN 664-9228) (e-mail *KShaw@DODIG.OSD.MIL*). See Appendix E for the report distribution. The audit team members are listed inside the back cover.

David Steensma

David K. Steensma
Deputy Assistant Inspector General
for Auditing

Office of the Inspector General, DoD

Report No. 97-010
(Project No. 5CA-3002.01)

October 28, 1996

Defense Information Systems Agency Management of Trouble Tickets for Electronic Commerce/Electronic Data Interchange

Executive Summary

Introduction. The Deputy Under Secretary of Defense (Acquisition Reform) is developing the Federal Acquisition Computer Network (FACNET) for Government-wide use in contracting as a means to expand business opportunities for small and medium sized enterprises. The FACNET infrastructure is composed of buying activities, gateways, Network Entry Points (NEPs), Value-Added Networks (VANs), and trading partners that the Government uses to electronically procure supplies and services. A buying activity sends a transaction through an application system to the supporting gateway. After translation, archiving, and other functions are performed by the gateway, it transmits the information to a NEP. The NEP receives the transactions and transfers them to VANs that distribute the information to trading partners. For FACNET to work properly, transactions have to be complete and conform to a standard format. Additionally, FACNET must operate reliably and deliver the transactions to the intended recipient in a timely manner. When problems with FACNET occur, they must be resolved quickly to minimize missed bidding opportunities for the trading partners. To resolve problems, the Defense Information Systems Agency (DISA), manager of FACNET, established a trouble resolution center at its Ogden, Utah, Megacenter. As of March 1996, approximately 900,000 electronic commerce/electronic data interchange transactions per month were processed through FACNET. The Megacenter documents problems that cannot be resolved immediately on a trouble ticket.

Audit Objectives. The audit objective was to examine the effectiveness of the trouble ticket process and to identify problem areas that, if corrected, would result in fewer trouble tickets. We also reviewed the adequacy of the management control program as it applied to the audit objective.

Audit Results. The Defense Information Systems Agency has not resolved recurring trouble ticket problems in the FACNET system. As a result, users who reported trouble tickets are dissatisfied with the trouble ticket system, trading partners have filed protests when bids have arrived too late to be considered, and the future success of the trouble ticket process in FACNET cannot be assured.

DISA is redesigning the FACNET infrastructure and believes that the redesign will resolve many of the recurring problems identified in this report. DISA officials stated that the redesign may not resolve problems relating to invalid transactions because those problems seemed to be related to user errors and data translation problems that are outside the scope of DISA responsibility.

As of March 22, 1996, DISA has significantly improved its resolution of trouble tickets by providing additional training to its trouble ticket resolution staff and by improving its resolution procedures. Although the number of trouble tickets reported on a daily basis has not declined, the DISA backlog has been reduced to 76 trouble tickets.

We reviewed the adequacy of DISA management controls over the trouble ticket process. Specifically, we reviewed DISA management controls over trouble ticket reporting and resolution procedures. No material management control weaknesses were identified.

Summary of Recommendations. We recommend that the Director, Defense Information Systems Agency:

o establish milestones for redesign of the FACNET infrastructure to promptly resolve the recurring problems identified in this report.

o until the redesign is complete, DISA should implement interim procedures to correct recurring problems related to invalid transactions, lost and late transactions, inability to track transactions, and the lack of an acknowledgment for receipt of transactions.

We recommend that the Deputy Under Secretary of Defense (Acquisition Reform) mandate to the Services and agencies that functional acknowledgments are required for all transaction sets since the Services and Agencies own the automated information systems at the user ends.

Management Comments. The Director, Defense Information Systems Agency, concurred with the report recommendations. The Director stated that the Defense Information Systems Agency either has implemented or plans to implement corrective actions. However, the Defense Information Systems Agency requested redirection of one recommendation. The Deputy Under Secretary of Defense (Acquisition Reform) should mandate to the Services and agencies that functional acknowledgments are required for all transaction sets, since the Services and agencies own the automated information systems at the user ends. See Part I for a discussion of management comments. See Part III for the complete text of management comments.

Audit Response. The actions proposed by the Defense Information Systems Agency are fully responsive and meet the intent of our recommendations. At the request of the Defense Information Systems Agency, we redirected the recommendation on responsibility for functional acknowledgements to the Deputy Under Secretary of Defense for (Acquisition Reform). We request that the Deputy Under Secretary of Defense (Acquisition Reform) comment on the recommendation by January 6, 1997.

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Part I - Audit Results

Audit Background

The Federal Acquisition Streamlining Act of 1994. The Federal Acquisition Streamlining Act authorized simplified acquisition procedures for procurements up to $100,000 using Federal Acquisition Computer Network (FACNET). FACNET is a communications network that the Government uses to electronically transport Electronic Commerce/Electronic Data Interchange (EC/EDI) transactions between Government buying organizations and their trading partners. The FACNET infrastructure is composed of buying activities, gateways, network entry points (NEPs), value added networks (VANs) and trading partners. A buying activity sends a transaction through an application system to the supporting gateway. After translation, archiving, and other functions are performed by the gateway, it transmits the information to a NEP. The NEP receives the EDI transactions and transfers them to VANs that have been certified. VANS distribute the information to trading partners. Trading partners return EDI transactions to the buying activity in the reverse process. The goal of FACNET is to speed up procurements and reduce procurement costs through increased competition.

Responsibility for Supporting FACNET. In a memorandum, "Defense Electronic Data Interchange Infrastructure Implementation," June 23, 1995, the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) assigned the Defense Information Systems Agency (DISA) responsibility to manage the FACNET infrastructure. DISA established the DoD EC/EDI Customer Service Center (CSC) Help Desk at the Ogden, Utah, Megacenter, to respond to problems encountered by participants in FACNET. Users of FACNET can report problems or questions to the CSC using a toll-free line 24 hours a day. If a question or problem cannot be resolved immediately, the CSC generates a trouble ticket. Six customer support personnel at the Megacenter review and analyze the trouble tickets. The CSC receives about 294 calls per day; however, customer support personnel at the Megacenter did not know how many of those calls were trouble ticket calls. The CSC generates about 14 FACNET trouble tickets per day. As of March 1996, there were 971,632 EC/EDI transactions processed through FACNET. Those transactions included 164,615 public transactions, which are requests for quotes, quotes, and purchase orders. The remaining transactions included, for example, test transactions, functional acknowledgments, delivery orders, or sole-source requests for quotes not advertised to the public.

Audit Objectives

The primary audit objective was to examine the effectiveness of the trouble ticket process and to identify problem areas that, if corrected, would result in fewer trouble tickets. We also reviewed the adequacy of the management control program as it applied to the primary audit objective. See Appendix A for a discussion of the scope and methodology and the review of the management control program. Appendix B summarizes prior coverage related to the audit objectives.

Recurring Problems That Result in Trouble Tickets

DISA has not resolved recurring problems identified by the trouble ticket process because resolution will require a major redesign of the existing FACNET or implementation of a new system. Recurring problems with the FACNET include:

o invalid transactions due to data input errors and incomplete information on transactions,

o lost and late transactions resulting both from unreliable communications links between the gateways and the VANs and from inoperative gateways,

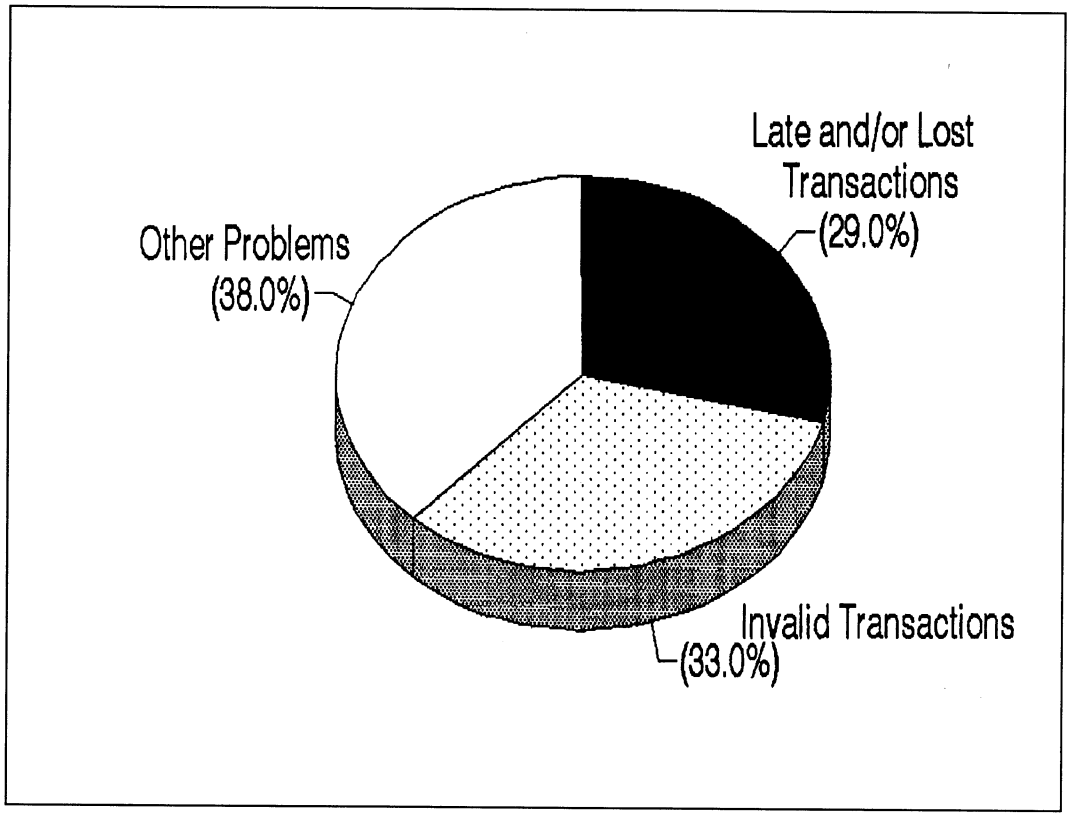
o an inability to track transactions as they flow through FACNET, and

o lack of acknowledgments for receipt of transactions upon arrival at their destinations.

As a result of the recurring problems, users are dissatisfied with the FACNET trouble ticket process, trading partners have filed protests when bids have arrived too late to be considered, and the future success of the FACNET trouble ticket process is uncertain.

Method of Analysis

We selected and analyzed a statistical sample of 130 trouble tickets from 2,163 trouble tickets received at the Ogden Megacenter during June through November 1995. Our analysis identified a series of problems that fall into several categories as shown in the figure on page 5.



Types of Problems Identified by Trouble Ticket System

We categorized the trouble ticket problems as invalid transactions, lost transactions, late transactions, and other problems. Other problems consisted of status of receipt, software, modem problems, procedures, and vendor registration. Three categories of recurring problems resulted in the most number of trouble tickets, specifically, invalid transactions, lost transactions, and late transactions. Additionally, although not specifically identified in our survey, we regard the inability for DISA to track FACNET transactions as a recurring problem because FACNET users frequently contacted the trouble ticket desk to inquire on the status of FACNET trouble ticket transactions. See Appendix C for detailed results of our analysis of the sampled trouble tickets.

Types of Problems Identified by Trouble Ticket System

Invalid Transactions. Forty-three trouble tickets were related to data input errors and incomplete information on transactions. For example, one of the VANs reported that the DoD gateway was sending certain transactions to an erroneous receiver identification number.

Lost and Late Transactions. Thirty-eight trouble tickets involved procurement transactions that were sent but never received by the intended party or were

received later than the sender expected. These involved seventeen vendors. Personnel at the VANs informed us that many of the lost and late transactions were the vendors' bids in response to requests for quotes. Personnel at the VANs identified 38 vendors who reported lost or late bids. Eleven of the 38 transactions were lost or not received by the buying activity until after contract award.

The lost and late transactions were attributed to several causes, including software problems at the Gunter Air Force Base Gateway, which caused message files to be lost or overwritten, and inoperative equipment at DoD gateways.

Status of Receipt. Four trouble tickets involved inquiries as to whether a transaction had been received by its intended recipient. The American National Standards Institute (ANSI) standard X12, on which FACNET is based, requires that a receipt, known as a functional acknowledgment, be automatically sent to the originator of a transaction upon receipt of the transaction. This process works much like sending a registered letter through the Postal Service. Without the functional acknowledgment, the trading partner has no proof that a transaction was received. Users who reported problems to the CSC that resulted in trouble tickets complained that FACNET did not always generate a functional acknowledgment for receipt of a transaction. Users also contacted the CSC when they did not receive a functional acknowledgment after submitting a transaction through FACNET.

We analyzed the functional acknowledgment transactions. Our review of the 130 transactions in the sample showed that there were no functional acknowledgments for 115 of the 130 sample transactions. Of the 115 cases where functional acknowledgments were not received, 15 were requests for quotes. The causes were break down of modems, and failure of computer equipment and software at the Columbus and Ogden NEPs and at the Gunter AFB Gateway.

Inability to Track FACNET Transactions. FACNET has no automated capability to track transactions through the network system. As a result, FACNET users could not readily determine whether their transactions were received in time for contract award. When users inquired about specific transactions at the Ogden Megacenter, the CSC generated a trouble ticket and manually tracked the transactions. This process is time-consuming and often did not permit the user to resubmit the transaction, if necessary, in time for award consideration. The inability to track FACNET transactions directly affected DISA's ability to provide a timely response to users who inquired about lost and late transactions or whether a transaction had been received.

Other Issues Reported

Users identified other problems related to the vendor registration, procedures for resolving problems, modems, software, and status of receipt of transactions.

Registration. Thirteen of the sampled trouble tickets related to vendors and organizations that were not registered in FACNET or vendors that had registered but provided erroneous information when they registered. Those vendors and sites were not able to process transactions through FACNET.

Procedures. Twelve of the sampled trouble tickets related to users' questions concerning procedures employed to resolve certain problems.

Modems. Eleven of the sampled trouble tickets related to modems that would not allow the customer to send transactions through FACNET.

Software. Nine of the sampled problems related to communications software that could not transmit data to FACNET.

Status of Receipt of Transactions. Four of the sampled trouble tickets resulted from users' inquiries about the status of transactions.

Issues Related to Recurring Problems

The recurring problems are attributable to a series of issues including the short statutory time frames for the implementation of FACNET; lack of standardization; allowance of broad participation by VANs; and the use by DISA of slow-speed, unreliable modems for linking VANs to FACNET.

Short Time Frame. The Federal Acquisition Streamlining Act of 1994 required that FACNET be implemented by January 1997. The milestone did not permit sufficient time for DISA to properly test FACNET or to procure the proper hardware and software. Consequently, DISA used existing computers for NEPs and gateways that were not well suited for FACNET technical requirements. For example, the NEP computers encountered technical difficulties when running multiple tasks and were not always reliable when polling the gateways for transactions. Further, because the computer vendor was experiencing financial difficulties, it could not readily correct the problems. As a result, transactions sent through FACNET were lost and late and not easily tracked, which resulted in the reported trouble tickets.

Lack of Standardization. Trouble tickets relating to invalid transactions were due in part to the use of an inappropriate version of the ANSI X12 standard for the transactions by vendors and VANs. DoD is using multiple versions of the 3010 ANSI X12 standard. The use of various versions of the ANSI X12 standard increased the chances of errors in data input and translation of the data to and from the ANSI X12 standard. In addition, the use of the multiple versions confused FACNET users because the information required for each version is different. Transactions generated for one version of the ANSI X12 standard are not directly interchangeable with other versions and require translation by special data mapping software. Multiple versions of the ANSI X12 standard caused invalid transactions, which could not be sent to and from vendors until the transactions were corrected and resent through FACNET.

Broad Participation by VANS. To encourage participation in FACNET, DISA approved and certified multiple VANs to participate. As of April 1996, 26 VANs were certified. However, Inspector General, DoD, Report No. 96-172, "Certification and Management of Value-Added Networks," June 24, 1996, reported that 15 VANS with questionable financial resources were certified, and the Government was not able to ensure that control was exercised to prevent and resolve deficient services by the VANs. Each VAN had unique connectivity and data processing requirements that interfered with effective transmission of transactions through FACNET. The VANs reported problems of invalid transactions and unreliable communication links to gateways. The unique connectivity and data processing problems by the VANs resulted in interruptions in the transmission of transactions, lost transactions, and late transactions. Also, unreliable communications links between the gateways and NEPS made it difficult to track transactions as they flowed through FACNET. In addition, customers did not receive functional acknowledgments from buying activities, gateways, NEPs and VANs, which would identify the location of transactions in FACNET.

Unreliable Modems. DISA allowed the gateways and NEPS to use unreliable modems to connect to FACNET. It would not have been cost-effective to update the current modems with imminent redesign of FACNET (see the section entitled "DISA Efforts to Resolve Recurring Problems" later in the report for details on the redesign). The modems did not always connect properly to FACNET, thus requiring manual intervention by DISA to keep them operating. As a result, 38 transactions out of 130 sampled were lost or late.

Effects of Trouble Ticket Issues

FACNET Success. For FACNET to be successful, users must have confidence that it can deliver procurement transactions to intended recipients in a timely and cost-effective manner. As a result of the recurring problems, FACNET users, both within DoD and vendors, indicated a high level of dissatisfaction with the trouble ticket process and with FACNET. Consequently, the credibility and future success of FACNET is questionable.

Users' Feedback on Trouble Ticket Process. Results from the analysis of the trouble tickets showed that 47 trouble ticket users, including vendors, were not satisfied with how DISA handled their problems. A total of 46 FACNET trouble ticket users we surveyed stated that problems were not resolved. Some 104 users, which included 100 VANS and 4 vendors said that reported problems have been the same types of problems reported by them on previous occasions. One hundred and three of the customers acknowledged they received notification from the NEPS of the status of the problem reported on their trouble tickets. One hundred and twenty three of the customers received a trouble ticket number from the CSC when they called back to ask about their problem.

DISA has made significant progress in processing the backlog of trouble tickets. During June through November 1995, the number of trouble tickets reported per day was about 14, the average time to process a trouble ticket was 23 days (ranging from 1 to 153 days), and the backlog of tickets was 578. The Ogden Network Administrator stated that as of March 22, 1996, the backlog decreased to about 76 trouble tickets. He stated that the number of trouble tickets reported per day is still about 14, and the average time to process them was still about 23 days. (Paradoxically, figures reported by the Office of the Director, DoD Electronic Commerce, indicate that the average time to process a trouble ticket as of March, was 6 days.)

Officials at Simplex, Incorporated, a certified VAN, stated that problems were often resolved too late, if ever. Requests for quotes placed on FACNET allow for responses to be made within 15 to 30 days; 29 of 130 transactions required more than 30 days for resolution. Also, 21 of 130 transactions or 16 percent of the transactions were lost, late and invalid transactions, which resulted in lost opportunities to bid. A delay of an average of 23 days for resolution of a lost or invalid transaction is not acceptable, and has resulted in lost business to vendors. Because of the delay in trouble ticket resolution and repeated problems, users have lost confidence in FACNET and are reluctant to use it.

Vendor Protests. At least three vendors have filed protests as a result of FACNET related problems. For example, one vendor protested the award of a contract to another vendor through FACNET by the Red River Army Depot. The vendor maintained that a bid was sent over FACNET in time for the bid to be considered, but the contracting office did not receive the transaction until after the award was made. The vendor who reported the trouble ticket problem was the low bidder. The bid was received late through FACNET, and the lowest bidder did not receive the award.

The Walter Reed Army Medical Center received two protests citing delayed receipt of bids. In a memorandum to the DoD Director, Electronic Commerce, the Deputy Assistant Secretary of the Army for Procurement cited 36 other instances in which transactions arrived too late to be considered for award. However, the Army successfully resolved these instances without protests being filed.

DISA Efforts to Resolve Recurring Problems

Problems will occur with the implementation of any complex electronic-based system. DISA established the trouble ticket process to identify specific problems with FACNET and resolve them. As discussed earlier, DISA has made progress in processing trouble tickets, and the backlog of trouble tickets has improved from November 1995 through March 1996. However, the number of trouble tickets reported per day, the time it takes to close a trouble ticket, and the recurring problems being reported have not decreased. In addition, followup phone calls indicated that vendors are not reporting trouble ticket problems, because they have lost faith in the trouble ticket process.

DISA Awareness of Issues. DISA is aware of the recurring problems identified by the trouble ticket process and is working to make long-term changes that should resolve some of the recurring problems identified in this report. However, DISA has not resolved recurring problems in the short-term.

System Redesign. DISA is redesigning the FACNET infrastructure and believes that the redesign should eliminate lost and late transactions, the inability to track transactions, and should provide functional acknowledgments for transactions. DISA officials stated, however, that the redesign may not resolve problems relating to invalid transactions because those problems seemed to be related to user errors and data translation problems that are outside the scope of DISA responsibility.

The FACNET redesign, referred to as the Electronic Commerce Processing Node, includes new equipment and software costing about $2.7 million. According to DISA officials, the Electronic Commerce Processing Node should include a transaction audit trail, a functional acknowledgment summary, and an automatic retransmission of messages when FACNET identifies a transmission error. These changes should facilitate more expeditious tracing and resolution of lost, late, or invalid transactions and should provide functional acknowledgments.

Implementation of the FACNET Redesign. We agree that the redesign, as proposed, should reduce the recurring problems related to lost and late transactions, the inability to track transactions, and the lack of functional acknowledgments for transactions. DISA is testing the new system; but has not established milestones for its implementation. Until the new system is in place, the recurring problems identified in the report will continue. To regain users' confidence DISA needs to establish when the new system will be implemented and functional. On August 5, 1996, DISA provided a report to the Director of DLA informing him of the results of the DoD test of the Electronic Commerce Processing Node. The report stated that The Electronic Commerce Processing Node delivered more than 650,000 transactions without any observed problems; demonstrated 100 percent accountability, and 99.5 percent transactions were completed. Average speed of service was 58 transactions per minute under a traffic load of 50,000 transactions per day. The final test results were briefed to Deputy Under Secretary of Defense (Acquisition Reform/Electronic Commerce) on August 20, 1996. DISA was determined not to implement the Electronic Commerce Processing Node capability on August 20, 1996, to ensure no disruption of service to the contracting users during year end close out.

In addition, DISA needs to identify how the recurring problems will be resolved in the interim. Such efforts should both reduce the trouble ticket work load and improve user confidence in FACNET.

Recommendations, and Management Comments

Redirected Recommendation. As a result of management comments requesting redirection of recommendations, we redirected Recommendation 3. to the Deputy Under Secretary of Defense (Acquisition Reform). DISA stated that the Deputy Under Secretary of Defense (Acquisition Reform) should mandate to the Services and agencies that functional acknowledgments are required for all transaction sets since the Services and agencies own the automated information systems at the user ends.

1. We recommend that the Director, Defense Information Systems Agency, establish milestones for implementation of the redesign of the Federal Acquisition Computer Network infrastructure to provide prompt capability to fix the recurring problems identified in this report.

Defense Information Systems Agency Comments. DISA concurred, stating that the Department tested the new Electronic Commerce Processing Node environment from April 23, 1996, to May 8, 1996, for Version 1.06 and from June 4, 1996, to June 7, 1996, for Version 1.06.2 and July 15, 1996, for version 1.07.1. Additional dates are available upon request.

2. We recommend that the Director, Defense Information Systems Agency, until the redesign is complete, implement interim procedures to resolve the problem identified in the report. At a minimum, the procedures should:

a. Provide an adequate transaction tracking system to identify the location of transactions in FACNET to ensure that transactions through FACNET are timely.

Defense Information Systems Agency Comments. DISA concurred, stating this tracking is accomplished using system logs at the Network Entry Points and Gateways. Logs are matched to ensure receipt and subsequent transmission of files.

b. Correct communications links between the Network Entry Points and the Value Added Networks to resolve lost and late transactions through FACNET.

Defense Information Systems Agency Comments. DISA concurred, stating that although the Agency does not own or control these supporting communications links, it has made the standards more stringent regarding the methodology that VANs use to communicate with the Network Entry Points/Electronic Commerce Processing Nodes.

3. We recommend that the Deputy Under Secretary of Defense (Acquisition Reform and Electronic Commerce) provide for functional acknowledgments to identify receipt of transactions upon arrival at their destination.

Management Comments. We request that the Deputy Under Secretary of Defense (Acquisition Reform) provide comments on the recommendation. No additional DISA comments on this recommendation are required.

Part II - Additional Information

Appendix A. Scope and Methodology

Audit Scope

Scope of Audit. We reviewed the procedures for recording and resolving trouble tickets at the Ogden Megacenter. Using the Internet, we retrieved a copy of a data base containing all 2,163 trouble tickets from the CSC. Using that data base, we developed summary statistics on DISA progress made in resolving the trouble tickets. We also selected a statistical sample of 130 trouble tickets for further review. We contacted the users who reported the problems that resulted in the 130 trouble tickets and surveyed their level of satisfaction with the trouble ticket process, the types of problems they had encountered, and their suggestions for improvement.

Use of Computer-Processed Data. We performed limited tests on the reliability of computer-processed data provided to us by the Ogden Megacenter. Because the data were sent electronically over the Internet, we tested record counts to determine file integrity. We also verified the accuracy of the data pertaining to our statistical sample. We did not find errors that would preclude use of the computer-processed data to meet the audit objectives or that would change conclusions in the report.

Audit Periods, Standards, and Locations. We performed this economy and efficiency audit from October 1995 through May 1996, in accordance with auditing standards issued by the Comptroller General of the United States, as implemented by the Inspector General, DoD. See Appendix D for organizations visited or contacted.

Audit Statistical Sampling Methodology

Sample Universe. The sample universe was composed of 2,163 trouble tickets generated by the Defense Megacenter, Ogden, Utah, from June 16, 1995, through November 13, 1995.

Sampling Plan. We drew a statistical sample of 130 trouble tickets from the universe of 2,163. We collected information about the 130 problems using a questionnaire to categorize and record user responses. We collected the information by telephone interviews and by questionnaires faxed to the organizations that reported problems that resulted in trouble tickets. We also followed up subsequent to the November 13, 1995, sample date to identify improvements or changes.

Sample Results. The sample results measured several characteristics of the trouble tickets as well as the number of days required to resolve the problem. We used the 90 percent confidence level in calculating our results.

All sample questions are attribute measures except question number 8, which asks, "how long did it take to resolve the problem?" There were 38 sample tickets that involved late or lost transactions; this projects to between 471 and 821 of the 2,163 trouble tickets, with 632 being the best single estimate. Among the 38, there were 16 we determined to be lost and 22 late. There were 43 sample tickets that involved invalid transactions; this projects to between 546 and 907 of the 2,163 trouble tickets, with 715 being the best single estimate. There were 49 sample tickets that involved other problems or characteristics; this projects to between 637 and 1,009 of the 2,163 trouble tickets, with 815 being the best single estimate. Among these 49 "other" reasons, 11 were modem problems, 4 status on receipt of transactions, 12 procedures, 13 registration, and 9 software. For question number 8, we have calculated the average number of days taken to resolve a trouble ticket. We project with 90 percent confidence that the average number of days taken to resolve the problem is between 18.3 and 27.2, with our best single estimate being 22.7. In using a 90 percent confidence level, we take a one in ten chance of having the population measure fall outside the confidence interval of our estimate.

Management Control Program

DoD Directive 5010.38, "Internal Management Control Program," April 14, 1987, requires DoD organizations to implement a comprehensive system of management controls that provides reasonable assurance that programs are operating as intended, and to evaluate the adequacy of the controls.

Scope of Review of the Management Control Program. We reviewed the adequacy of DISA management controls over the FACNET trouble ticket process. Specifically, we reviewed DISA management controls over trouble ticket reporting and resolution procedures. Because we did not identify a material weakness, we did not assess management's self-evaluation.

Adequacy of Management Controls. DISA management controls over trouble ticket reporting and resolution procedures were adequate as they applied to the audit objectives. We identified no material management control weakness.

Appendix B. Summary of Prior Audits and Other Reviews

The Office of the Inspector General, DoD, has issued four reports related to this audit.

Report No. 96-214, Inspector General, DoD, "Audit of Computer Security For The Federal Acquisition Computer Network" was issued August 22, 1996. The audit objective was to evaluate the procedures for data security, continuity of operations, transaction audit trails, personnel security, and compliance with network security requirements for the EC/EDI Program. The report recommends that DISA approve a plan and establish milestones for implementing digital signatures and data encryptions for the FACNET system and limit use of FACNET transactions that require signatures until DISA obtains digital signature capabilities, develops backup procedures for the FACNET gateways that include storage of critical data at an off-site location, and develops continuity-of-operations plans for the gateways. The report also recommends that DISA EC/EDI Program Management Office enhance network security by implementing a firewall protection mechanism and by ensuring that FACNET complies with controlled access protection requirements. DISA concurred with the draft recommendations but requested redirection of two recommendations to the Deputy Under Secretary of Defense (Acquisition Reform).

Report No. 96-172, Inspector General, DoD, "Certification and Management of Value-Added Networks," June 21, 1996. DISA did not establish an adequate Government VAN License Agreement to verify compliance with its provisions. As a result, 15 of the 25 VANs were certified, even though the adequacy of their financial resources was questionable, and the Government cannot ensure that control is exercised to prevent and resolve deficient services by the VANs. Also, the Government and vendors may be affected by the potential loss of business. The report recommends that the Director, DISA, issue policy for evaluating business qualifications, for monitoring VANs for compliance with the VAN License Agreement, and for expediting the completion and issuance of the new VAN License Agreement. DISA concurred with the recommendations for monitoring VANs for compliance with the VAN License Agreement and for expediting the completion and issuance of the new VAN License Agreement. DISA nonconcurred with the recommendation to issue policy for evaluating business qualifications. To address this problem, DISA issued a new VAN license agreement in August 1996. Under the new VAN license agreement, procedural changes should improve the certification process by requiring more stringent functional tests. DISA relies on the credibility of the VANs being demonstrated through the successful completion of extensive functional testing.

Report No. 96-129, Inspector General, "DoD Implementation of Electronic Commerce in Contracting for Small Purchases," May 24, 1996. The review identified a series of issues involved in the implementation of electronic commerce within DoD. The issues identified include: realization of the "single face to industry concept; adequacy of the transmission of data by the

DoD FACNET infrastructure; implementation of security controls; level of vendor participation; adequacy of management controls for FACNET transactions; and adequate development of FACNET implementation plans. This report contained no findings or recommendations.

Report No. 96-057, Inspector General, "DoD Use of Electronic Bulletin Boards in Contracting," January 8, 1996. DoD, procurement offices were not using bulletin boards to circumvent or impede FACNET implementations. Rather, procurement offices were using bulletin boards as an interim means to meet their procurement requirements until the Government-wide FACNET was fully operational. No recommendations were made; however, the Deputy Assistant Secretary of the Air Force (Contracting), Office of the Assistant Secretary of the Air Force (Acquisition), provided comments on the report. The Deputy Assistant Secretary concurred with the audit results and emphasized the need for a common set of goals and definitions to be used in implementing EC/EDI. The Deputy Assistant Secretary requested that the terms "full operational capability" and "single face to industry" be further defined.

Appendix C. Analysis of the Trouble Ticket Random Sample

We selected a statistical sample of 130 trouble tickets from the 2,163 trouble tickets that were generated as a result of reported problems or questions. Seventy-two of the trouble tickets in our sample were reported by VANs; 41 were reported by trading partners; 14 were reported by gateways; and 3 were reported by the Ogden NEP. We contacted the users that reported the problems and solicited responses on the nature of the problem and the level of satisfaction with the trouble ticket process. We obtained responses on all 130 sampled trouble tickets. Responses from that survey are shown below.

1. *Were you satisfied with the service you received*?

   Yes 83 No 47

2. *Was your problem resolved to your satisfaction*?

   Yes 84 No 46

3. *Were you notified of the status and the results of the trouble ticket*?

   Yes 103 No 27

4. *Were you provided a trouble ticket number for followup*?

   Yes 123 No 7

5. *If closed, did the help desk call to obtain permission to close the trouble ticket*?

   Yes 73 No 26 (Not Closed) 31

6. *Did you receive a 997 acknowledgment for the transaction identified on the trouble ticket*?

   Yes 15 No 115

7. *Do you have access to the trouble ticket resolution diary at Ogden NEP*?

   Yes 10 No 120

8. *How long did it take to resolve the problem*?

   Respondents indicated that the time to resolve problems reported on trouble tickets ranged from 1 to 153 days. The average was 23 days.

9. *Has the same problem occurred before?*

Yes 104 No 26

10. *What was the nature of the problem?*

16	Lost transactions
22	Late transactions
43	Invalid transactions
11	Modem problems
4	Status on receipt of transactions
12	Procedures
13	Registration
9	Software
130	

11. *Do you have any suggestions for improving the trouble ticket process?* Responses included the following.

o "Install validation error checking software at the procurement activities, gateways, and NEPs to identify transaction errors."

o "DISA should make the Remedy Corporation Action Request System software available to all users of the trouble ticket reporting system to keep informed of the current status of problem resolution."

o "DISA provide more trained personnel to process and resolve trouble tickets for faster resolution of reported problems."

o "Email should be used by all user organizations and customer service personnel for a permanent record of the trouble ticket problem resolution process."

o "DISA should issue instructions for EDI transaction processing to reduce the number of data input errors for problem resolution on trouble tickets."

o "DISA should issue instructions and procedures for reporting and processing trouble tickets to all user organizations reporting problems for trouble ticket resolution."

o "Users want points of contact at gateways to inform them of problem transactions in time to be corrected and resent in the system."

o "Track transactions by batch number, number of documents by date and time to verify the receipt of the mail bag and send error message if not received."

o "VANs should be informed of new sites registered with Central Contractor Registration to process transactions for organizations in the system."

o "Rejected transactions, such as invalid bids, should not be accepted for contract award."

o "Trouble tickets must be resolved timely to process requests for quote and bids in time to be considered for contract award."

o "The Ogden NEP customer service personnel need more training on trouble ticket processing procedures."

o "Procurement activities should review the 997 acknowledgment for receipt of bid and transmit the bid information in time to allow vendors time to respond to the request for quote from the procurement activity."

o "Sites should review 997 logs to identify problem transactions that can be corrected in time to be considered for contract award."

o "Buying activities need to allow more time for vendors to receive and respond to request for quotes."

o "The tracking system needs to be improved to identify the location of a transaction in the system. This will prevent lost and late transactions. Messages that have not been delivered date back to October 1995."

o "The contractor/vendor needs to be notified that the procurement activity received the bid."

o "Software needs to be improved because there are problems with software reissuing transactions."

Appendix D. Organizations Visited or Contacted

Office of the Secretary of Defense

Under Secretary of Defense for Acquisition and Technology, Washington, DC
Deputy Under Secretary of Defense (Acquisition Reform), Washington, DC

Department of the Army

Assistant Secretary of the Army (Research, Development, and Acquisition), Washington, DC
Headquarters, U.S. Army Medical Command, Fort Sam Houston, TX
Walter Reed Army Medical Center, Washington, DC

Department of the Navy

Assistant Secretary of the Navy (Financial Management and Comptroller) Washington, DC
Fleet and Industrial Supply Center, Norfolk, VA
Fleet and Industrial Supply Center, Puget Sound, WA
Fleet and Industrial Supply Center, San Diego, CA

Department of the Air Force

Assistant Secretary of the Air Force (Financial Management and Comptroller) Arlington, VA
Air Force Development Test Center, Eglin Air Force Base, FL
Maxwell Air Force Base-Gunter Annex, Montgomery, AL

Other Defense Organizations

Director, Defense Information Systems Agency, Arlington, VA
Defense Megacenter Columbus, OH
Defense Megacenter Mechanicsburg, PA
Defense Megacenter Ogden, UT

Non-Government Organizations

Advanced Communication Systems, North Olmsted, OH
Ail Corporation, Columbus, OH
Alpha Pacific, Lajolla, CA
American Telephone and Telegraph, Philadelphia, PA

Appendix D. Organizations Visited or Contracted

Carlsbad Export, Carlsbad, CA
Crane Company, Northshore, WI
Datamatix, Plymouth Meeting, PA
Design Furniture Company, Frederick, MD
Electra Medical Corporation, Flint, MI
Emery World, Atlanta, GA
Extended Service, Los Angeles, CA
General Electric Information Systems, Rockville, MD
Gulf Coast Systems, Crestview, FL
Gray Supply Company, East Chicago, IL
Harbinger EDI Services, Atlanta, GA
Miami Computer Supply, Miami, FL
Peterson Builders, Troy, MI
Rico Industrial Supply, Columbus, GA
Simplex, Troy, MI
Softshare Information Services, Santa Barbara, CA
Southwest Quality Supply Company, Albuquerque, NM
Technology Management Programs, Carlsbad, CA
Total Procurement Services, Novato, CA
TranSettlements, Incorporated, Atlanta, GA

Appendix E. Report Distribution

Office of the Secretary of Defense

Under Secretary of Defense for Acquisition and Technology
  Deputy Under Secretary of Defense (Acquisition Reform)
Under Secretary of Defense (Comptroller)
  Deputy Chief Financial Officer
  Deputy Comptroller (Program/Budget)
Assistant Secretary of Defense (Command, Control, Communications and Intelligence)
Assistant to the Secretary of Defense (Public Affairs)

Department of the Army

Assistant Secretary of the Army (Financial Management and Comptroller)
Auditor General, Department of the Army

Department of the Navy

Assistant Secretary of the Navy (Financial Management and Comptroller)
Auditor General, Department of the Navy

Department of the Air Force

Assistant Secretary of the Air Force (Financial Management and Comptroller)
Auditor General, Department of the Air Force

Other Defense Organizations

Director, Defense Contract Audit Agency
Director, Information Systems Agency
Director, Defense Logistics Agency
Director, National Security Agency
  Inspector General, National Security Agency
Director, Defense Logistics Studies Information Exchange
Inspector General, Defense Intelligence Agency

Non-Defense Federal Organizations

Federal Electronic Acquisition Program Management Office, General Services Administration
Office of Management and Budget
Technical Information Center, National Security and International Affairs Division, General Accounting Office

Chairman and ranking minority member of each of the following congressional committees and subcommittees:

- Senate Committee on Appropriations
- Senate Subcommittee on Defense, Committee on Appropriations
- Senate Committee on Armed Services
- Senate Subcommittee on Acquisition and Technology, Committee on Armed Services
- Senate Committee on Governmental Affairs
- House Committee on Appropriations
- House Subcommittee on National Security, Committee on Appropriations
- House Committee on Government Reform and Oversight
- House Subcommittee on National Security, International Affairs, and Criminal Justice, Committee on Government Reform and Oversight
- House Committee on National Security

Part III - Management Comments

Defense Information Systems Agency Comments

DEFENSE INFORMATION SYSTEMS AGENCY
701 S. COURTHOUSE ROAD
ARLINGTON, VIRGINIA 22204-2199

IN REPLY REFER TO Inspector General

23 Aug 96

MEMORANDUM FOR DEPARTMENT OF DEFENSE INSPECTOR GENERAL
ATTN: Director, Contract Management

SUBJECT: Comments to DODIG Draft Report on DISA's Management of Trouble Tickets for Electronic Commerce/Electronic Data Interchange (Project No. 5CA-3002.01)

Reference: DODIG Report, subject as above, 24 Jun 96

1. The Defense Information Systems Agency (DISA) has reviewed the subject draft report and generally concurs with the findings and recommendations. We partially concur with Recommendation 2c and recommend it be redirected to the Deputy Under Secretary of Defense for Acquisition and Reform and Electronic Commerce (DUSD(AR/EC) as they have the authority to implement the recommendation. Our detailed management comments are enclosed.

2. The point of contact for this action is Ms. Sandra J. Sinkavitch, Audit Liaison, on (703) 607-6316.

FOR THE DIRECTOR:

1 Enclosure a/s

RICHARD T. RACE
Inspector General

Quality Information for a Strong Defense

**COMMENTS TO DODIG DRAFT REPORT OF
DISA'S MANAGEMENT OF TROUBLE TICKETS FOR
ELECTRONIC COMMERCE/ELECTRONIC DATA INTERCHANGE
(PROJECT NO. 5CA-3002.01)**

RECOMMENDATION 1: Establish milestones for implementation of the redesign of the FACNET infrastructure to provide prompt capability to fix the systemic problems identified in the report.

COMMENTS: CONCUR. The Department tested the new Electronic Commerce Processing Node environment from 23 April 1996 to 8 May 1996 for Version 1.06 and from 4 to 7 June 1996 for Version 1.06.2. Testing consisted of various operational scenarios between the Joint Interoperability Test Center, Operational Support Facility, and production sites. The tests addressed several of the systemic problems identified in the draft report. Also, testing began on 15 July 1996 for Version 1.07.1 which offers even more operator tools. A more detailed listing of program schedules, to include which software build incorporates new operator/system management tools, along with test reports are available upon request.

RECOMMENDATION 2: Until the redesign is complete, implement interim procedures to resolve the problem identified in the report. At a minimum, the procedures should:

a. Provide an adequate transaction tracking system to identify the location of transactions in FACNET to ensure that transactions through FACNET are timely.

COMMENT: CONCUR. This tracking is accomplished using system logs at the Network Entry Points and Gateways. Logs are matched to ensure receipt and subsequent transmission of files. Also, we work closely with our connected Value Added Networks to ensure we know where transactions are within the system. This has greatly enhanced our ability to resolve issues that surface regarding a transactions located within the infrastructure. Currently, we rely on the Service/Agency/VAN systems administrators to provide and correlate these actions.

b. Correct communications links between the Network Entry Points and the Value Added Networks to resolve lost and late transactions through FACNET.

COMMENT: CONCUR. Although the Agency does not own or control these supporting communications links, we have made the standards more stringent regarding the methodology that VANs may communicate with the Network Entry Points/Electronic Commerce Processing Nodes. We have convinced several VANs to upgrade

Final Report Reference

their communications circuits from voice grade to data grade, establish dedicated 56 kBps service versus 9.6 kBps dial-up (1-800 type service), and convert from bisync to file transfer protocol/simple mail transfer protocol communications connectivity. We believe these changes will greatly reduce the numbers of lost/late transactions as demonstrated during the Department's test of the new operational environment.

Revised Recommendation 3.

RECOMMENDATION 2c: Provide for functional acknowledgments to identify receipt of transactions upon arrival at their destination.

COMMENT: CONCUR IN PART. The new operational environment, as well as the existing environment, is capable of this function. However, to make this truly viable, DOD will have to mandate to the Services and Agencies that functional acknowledgments are required for all transaction sets since the Services and Agencies own the automated information systems at the user ends. If this policy is implemented, then functional acknowlegements must be generated in accordance with agreed to implementation conventions and standards. The following paragraph has been inserted into the new Van License Agreement: "Para 1.2.4. ...For all public Government transactions, the VAN must acknowledge with a 997. The VAN must produce a single 997 to acknowledge public transactions; the VAN shall not forward 997s from/to individual TPs." The recommendation should be redirected to the Deputy Under Secretary of Defense for Acquisition Reform and Electronic Commerce.

Audit Team Members

This report was prepared by the Contract Management Directorate, Office of the Assistant Inspector General for Auditing, DoD.

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