



*Customer Account Data Engine 2
Performance and Capacity Is Sufficient, but
Actions Are Needed to Improve Testing*

May 16, 2012

Reference Number: 2012-20-051

This report has cleared the Treasury Inspector General for Tax Administration disclosure review process and information determined to be restricted from public release has been redacted from this document.

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HIGHLIGHTS

CUSTOMER ACCOUNT DATA ENGINE 2 PERFORMANCE AND CAPACITY IS SUFFICIENT, BUT ACTIONS ARE NEEDED TO IMPROVE TESTING

Highlights

Final Report issued on May 16, 2012

Highlights of Reference Number: 2012-20-051 to the Internal Revenue Service Chief Technology Officer.

IMPACT ON TAXPAYERS

Built on the foundations of the current Customer Account Data Engine (CADE), CADE 2 will allow the IRS to convert the existing weekly individual taxpayer account processing system to daily batch processing. Such an enhancement should improve the service provided to taxpayers by allowing the IRS to more effectively and efficiently update taxpayer accounts, support account settlement and maintenance, and process refunds on a daily basis. The ability of the IRS to accurately execute, monitor, and assess performance and capacity testing directly affects whether, after implementation, CADE 2 will be capable of processing the necessary quantity and types of information within required time frames. The untimely completion of information processing could result in delayed taxpayer refunds and reduced customer service.

WHY TIGTA DID THE AUDIT

The overall objective of this review was to determine whether the IRS is effectively testing the performance and capacity of CADE 2. This audit was included in our Fiscal Year 2011 Annual Audit Plan and addresses the major management challenge of Modernization of the IRS.

WHAT TIGTA FOUND

The IRS has successfully established a testing environment for CADE 2 that is representative of the production environment. This is allowing the IRS to obtain meaningful data from its pre-production tests. However, the IRS did not

follow procedures to ensure that performance requirements were completely tested during the Final Integration Test Phase I. As a result, the IRS may not have acquired all the necessary information to make a fully informed decision on the ability of the CADE 2 system to effectively process transactions under expected normal and peak workload conditions, within acceptable response time thresholds. TIGTA also found that the IRS needs to develop procedures for access to and retention and maintenance of testing artifacts for Final Integration Testing.

WHAT TIGTA RECOMMENDED

TIGTA recommended that the Associate Chief Information Officer, Applications Development, ensure internal controls for testing performance and capacity requirements are formally and effectively implemented to ensure the traceability of these requirements through the performance testing process. This should include the use of integrated automated tools, when warranted by program and project size, to improve the consistency and completeness of testing performance and capacity requirements. In addition, the IRS should develop procedures related to the access to and retention and maintenance of testing artifacts for performance testing.

In their response to the report, IRS management agreed with TIGTA's recommendations. The IRS plans to ensure internal controls for testing performance and capacity requirements are formally and effectively implemented to ensure the traceability of these requirements through the performance testing process. This will include the use of automated tools for testing, where appropriate. The IRS also plans to review and, as warranted, develop procedures related to the access to and retention and maintenance of testing artifacts across all test projects.



TREASURY INSPECTOR GENERAL
FOR TAX ADMINISTRATION

DEPARTMENT OF THE TREASURY

WASHINGTON, D.C. 20220

May 16, 2012

MEMORANDUM FOR CHIEF TECHNOLOGY OFFICER

FROM:

Michael R. Phillips

Michael R. Phillips

Deputy Inspector General for Audit

SUBJECT:

Final Audit Report – Customer Account Data Engine 2 Performance and Capacity Is Sufficient, but Actions Are Needed to Improve Testing (Audit # 201120026)

This report presents the results of our review to determine whether the Internal Revenue Service (IRS) is effectively testing the performance and capacity of the Customer Account Data Engine 2. This audit was included in our Fiscal Year 2011 Annual Audit Plan and addresses the major management challenge of Modernization of the IRS.

Management's complete response to the draft report is included as Appendix V.

Copies of this report are also being sent to the IRS managers affected by the report recommendations. Please contact me at (202) 622-6510 if you have questions or Alan R. Duncan, Assistant Inspector General for Audit (Security and Information Technology Services), at (202) 622-5894.



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Abbreviations

CADE	Customer Account Data Engine
FIT	Final Integration Testing
IRS	Internal Revenue Service
RTVM	Requirements Traceability Verification Matrix



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Background

The Internal Revenue Service (IRS) had two primary production systems that processed individual taxpayer account data, the Individual Master File¹ and current Customer Account Data Engine (CADE). In June 2011, current CADE tax processing was taken out of production in order to implement changes necessary for its integration with CADE 2. The IRS underwent a major development effort to deploy CADE 2 functionality in January 2012.

The IRS approach for delivery of CADE 2 is a functional and technical progression through two Transition States to a Target State. Transition State 1 has two main purposes: 1) to establish a database that will house all individual taxpayer accounts and provide the ability for IRS employees to view the updated account information online (Database Implementation); and 2) to provide individual taxpayer account information to select external systems on a daily basis as opposed to the current weekly basis (Daily Processing). Affected processes include the receipt and submission of tax returns; the processing and management of accounts, examinations, collections; and criminal investigation. The key IRS customer service system, the Integrated Data Retrieval System, would also realize the benefit of more timely posted data. Such an enhancement to these business processes and systems should improve the service provided to taxpayers by allowing the IRS to more effectively and efficiently update taxpayer accounts, support account settlement and maintenance, and process refunds on a daily basis. Transition State 1 Daily Processing went live, as planned, on January 17, 2012.

Transition State 2 will address financial material weaknesses and build or modify existing applications to directly interact with the CADE 2 database. Finally, the Target State will focus on completing the transition of all applications and achieving the business benefits that are enabled by the target solution. This final step is necessary to provide for the long-term viability of the CADE 2 platform.

As part of Transition State 1, the IRS performed Final Integration Testing (FIT), which is an end-to-end integration test of multiple systems which support the high-level business requirements. The FIT is planned from the perspective that all IRS application systems are subsystems to an overall tax processing system. The tax processing system consists of hundreds of subsystems operating on many unique hardware and software platforms. The FIT is designed to ensure that IRS systems work together correctly prior to production start up. CADE 2 Daily Processing started FIT Phase I on July 7, 2011, and concluded on October 7, 2011. The testing was completed after the planned end date which allowed the IRS to perform additional testing, analyze metrics, and revalidate failed tests.

¹ See Appendix IV for a glossary of terms.



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CADE 2 FIT Phase I was used to demonstrate the system's capability to execute daily processing jobs within allocated performance windows in a near production-like environment. In order to provide testing in a simulated production environment, FIT Phase I utilized a copy of production data to prepare test cases with predetermined results. Unique test cases created based on requirements were used to verify systemic interoperability. Data were processed and passed from system to system exercising all communication links to demonstrate that information was being correctly exchanged between applications.

We focused our review on performance and capacity requirements that were tested during CADE 2 FIT Phase I. Database Implementation was removed from FIT Phase I and will be tested separately in a future test outside of FIT Phase I. As a result of Database Implementation not being tested during FIT Phase I, it was removed from the scope of this audit.

This review was performed at the Modernization and Information Technology Services organization facility in New Carrollton, Maryland, during the period November 2011 through February 2012. We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objective. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective. Detailed information on our audit objective, scope, and methodology is presented in Appendix I. Major contributors to the report are listed in Appendix II.



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Results of Review

The Customer Account Data Engine 2 Test Environment Is Representative of the Production Environment

The IRS's Test Assurance Documentation Standards and Procedures detail the procedures and guidelines for establishing a test environment. The test environment should emulate the production environment to the greatest degree possible.

The FIT Phase I test was conducted on mainframe platforms located at the Enterprise Computing Centers in Martinsburg, West Virginia, and Memphis, Tennessee. At Martinsburg, the test environment consisted of International Business Machines Corporation z990 and z10 mainframe computers. At Memphis, the mainframe test environment consisted of a Unisys Corporation 780 Dorado mainframe computer and an International Business Machines Corporation z900 mainframe computer. The testing of tax processing that occurs on the IRS's server environment was conducted in the IRS Enterprise Systems function's Test Lab located in New Carrollton, Maryland.

To simulate production-like volumes for CADE 2 Daily Processing testing and test case development, the IRS used data from the submission processing sites and Master File for 2011 peak production cycles. These data represent the April 15th peak tax processing period and the weeks immediately before and after it. Data from these cycles are the closest representation of what daily processing will be like in a peak period in Processing Year 2012.

We compared the physical overview diagrams of the two environments and then validated the system specifications listed in capacity requirements. Our comparison indicated that the major infrastructure components are identical, but that there are slight differences in processing capability, storage capacity, and memory. Discussions with IRS subject matter experts and our review of IRS documentation indicated these slight differences were expected. The IRS reiterated that the CADE 2 test environment was designed to be representative of the production environment, not an exact replica of it.

Procedures Were Not Effectively Followed to Ensure Performance Requirements Were Completely Tested During Final Integration Test Phase I

The IRS Test Assurance Documentation Standards and Procedures detail the requirement analysis process. This analysis is the cornerstone of a systems acceptability test. A requirement, at its lowest decomposed level, provides specific information for a single function performed by a



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software application. A process exists whereby a person or machine can verify that the system built meets the requirement (that is, the requirement is testable). Taken collectively, requirements completely define all system capabilities.

These procedures also stress the importance of a Requirements Traceability Verification Matrix (RTVM), one of the key controls used to provide IRS management with evidence that requirements are sufficiently gathered prior to the development of test cases. An RTVM also helps to ensure all requirements are included in test cases and are tested. The absence of an RTVM increases the risk that not all requirements are tested to ensure the system works as intended.

To validate the core changes to the tax pipeline processing system as a whole, the IRS tested a subset of high-level CADE 2 requirements. The FIT Phase I End of Test Status Report stated that the requirements selected for testing were documented as scenarios, and that the IRS documented, tracked, and monitored these test scenarios in an automated tool.

We evaluated 227 performance and capacity requirements from a repository of CADE 2 requirements. All of these requirements were included in authorized and approved Database Implementation or Daily Processing internal design documents. These documents recognize the use of various requirements as the basis for the business solution design, development, integration, testing, and deployment of the CADE 2 system. We determined that 70 (31 percent) of these performance requirements were included in the RTVM and could be traced to 702 corresponding test cases. Figure 1 provides a detailed breakdown of the number of requirements that were or were not traced to test cases.

Figure 1: Performance and Capacity Requirements Traced to Test Cases

Requirements Traced to Test Cases	Number
Requirements With Test Cases	70 (31%)
Requirements With No Test Cases	
Environmental Design	66 (29%)
Database Implementation	68 (30%)
Daily Processing	23 (10%)
Total	227 (100%)

Source: Treasury Inspector General for Tax Administration analysis of IRS performance and capacity requirements.

The IRS indicated that 66 (29 percent) performance and capacity requirements were environmental design requirements. While these requirements were not supported with documented test cases, they were supported by Government equipment lists showing hardware



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purchases to meet the requirement capabilities. Eight of these 66 requirements specifically referenced hardware specifications such as number of terabytes or Millions of Instructions Per Second. For each of these eight requirements, we successfully traced the amount of storage, processing speed, or memory that was listed to the physical components shown in the FIT Plus Environment Physical Overview Diagram. We also reviewed an IRS comparison of the CADE 2 production environment to the CADE 2 FIT test environment. In addition, the IRS internally validated the addition of CADE 2 components into the existing FIT environment.

Sixty-eight (30 percent) of the requirements were categorized as Database Implementation requirements. As previously discussed, Database Implementation testing was removed from the scope of FIT Phase I. There were no test cases provided for these Database Implementation requirements. The remaining 23 (10 percent) Daily Processing requirements were not supported with test cases. One of these requirements was identified as a future test outside the scope of FIT Phase I. The remaining 22 requirements did not have documented test cases or were not traced to an alternative testing method. This lack of internal control in ensuring that all requirements are traced to an appropriate testing method increases the potential risk of future performance issues.

Test scripts establish the relationships between the requirements to be tested and the associated test cases. Each test script is run and marked as passed, failed, or incomplete/inconclusive. Figure 2 provides a detailed breakdown of the results for each category. Our review of the IRS testing results determined that 215 (31 percent) of 702 test scripts passed and 255 (36 percent) were incomplete or inconclusive due to processing issues. The IRS indicated that the processing issues included, but were not limited to, errors in programming language.

Figure 2: Performance Test Results

Test Script Results	Number
Failed	232 (33%)
Incomplete/Inconclusive	255 (36%)
Passed	215 (31%)
Total	702 (100%)

Source: Treasury Inspector General for Tax Administration analysis of IRS performance testing results.

The performance testing results in Figure 2 were only one of several factors considered in the decision to move forward from FIT Phase I testing and could not be considered alone in determining the production readiness of the system. An in-depth analysis of CADE 2 performance testing was conducted by IRS subject matter experts with the assistance of contractors. This analysis led to adjustments being made to several variables, including the processing time frame targets and the testing environment. These adjustments addressed the performance test failures, as well as incomplete and inconclusive test results, thereby resulting in



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CADE 2 performing within required time frames and providing management with confidence to move forward from FIT Phase I to further performance testing.

As a result of FIT Phase I testing and other analyses, the IRS made the determination that CADE 2 Daily Processing is capable of processing the required quantities and types of transactions within the specified predetermined time frames. However, we identified a lack of effective planning and compliance with established procedures in the development of an RTVM and ensuring that all requirements were tested.

The IRS did not effectively implement or consistently use two automated tools that could have provided improved traceability for requirements in the testing process. As a result, performance and capacity requirements could not be traced to testing results. The inconsistent use of these tools resulted in the IRS using a manual process to manage the test cases, potentially resulting in unnecessary complexity and inefficiency within the test management and reporting process.

By not ensuring that each requirement had a test case; documenting its traceability, including the results of testing; and identifying when requirements were to be tested, the IRS has increased the potential risk that the CADE 2 system will not perform in an acceptable manner. The risk exists that the IRS has not tested all requirements associated with system performance because test cases were not developed or were overlooked due to the lack of a documented schedule. Due to these risks, the potential exists that the IRS did not acquire all necessary information to make a fully informed decision on the capability of the CADE 2 system to effectively process transactions under expected normal and peak workload conditions, within acceptable response time thresholds.

Recommendation

Recommendation 1: The Associate Chief Information Officer, Applications Development, should ensure that internal controls for testing performance and capacity requirements are formally and effectively implemented to ensure the traceability of these requirements through the performance testing process. This should include the use of integrated automated tools, when warranted by program and project size, to improve the consistency and completeness of testing performance and capacity requirements.

Management's Response: The IRS agreed with the recommendation. The Associate Chief Information Officer, Applications Development, will ensure internal controls for testing performance and capacity requirements are formally and effectively implemented to ensure the traceability of these requirements through the performance testing process. This will include the use of automated tools for testing, where appropriate.



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Procedures Need to Be Developed for Access to and Retention and Maintenance of Testing Artifacts

According to the FIT Phase I Technical Test Plan, dated April 8, 2011, test artifacts should be saved in either hard copy or to electronic media and retained for one year. These artifacts include input and output data files, logs and matrices, and test documentation (e.g., project folders, scenarios, and test cases). The test plan also states that once the CADE 2 FIT Phase I was completed that these test artifacts were to be kept for an agreed-upon length of time, up to one year. Guidelines for the file backup and retention process can be found in IRS procedures entitled *Types of Records and their Life Cycle*.

System logs are the artifacts that support test case results for tests run during FIT Phase I performance testing. Logs are automatically created and stored for a predetermined amount of time. The information in these logs, specifically job start and end times, are used to determine whether a job completed in its allotted amount of time and, therefore, is the basis for whether a test has passed or failed.

During on-site observations, we presented the IRS with multiple test cases of differing results (*i.e.* pass, fail, incomplete) from the FIT Phase I performance RTVM. The process to identify test artifacts in support of these testing results was an informal process consisting of multiple steps. To identify the test artifacts using this process, IRS personnel used an online test case management tool to identify a test script within a test case, then referred to a detailed spreadsheet used to maintain artifact details, and finally accessed a separate application that interfaced with and pulled artifact data from the specific mainframe computer on which the testing was performed. The process for retaining and accessing testing artifacts for FIT Phase I performance testing was not documented or formalized. However, the IRS indicated that formal procedures are currently in development.

The IRS did not create formal procedures for the access to and retention of testing artifacts prior to initiating CADE 2 FIT Phase I testing, but relied on an informal process that was different for each system that maintained the artifact information. A lack of formal procedures regarding the access to and retention and maintenance of FIT Phase I performance testing artifacts increases the potential that artifacts may not be maintained in accordance with data retention procedures. The lack of standardization in maintenance of testing artifacts increases the risk that artifacts needed for future review or for use in other development projects may not be available.

Recommendation

Recommendation 2: The Associate Chief Information Officer, Applications Development, should develop procedures related to the access to and retention and maintenance of testing artifacts for performance testing.



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Management's Response: The IRS agreed with the recommendation. The Associate Chief Information Officer, Applications Development, will review and, as warranted, develop procedures related to the access to and retention and maintenance of testing artifacts across all test projects.



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Appendix I

Detailed Objective, Scope, and Methodology

The overall objective of this audit was to determine whether the IRS is effectively testing the performance and capacity of CADE 2. To accomplish this objective, we:

- I. Determined whether the performance and capacity requirements were authorized and test cases existed for the requirements.
 - A. For Database Implementation:
 1. Determined whether all performance requirements, as stated in *CADE 2 Database Implementation Transition State 1 Performance Measurement Plan - 09/02/2011*, were properly approved by management by determining if source documents (e.g., Database Implementation Business System Report and Database Implementation Design Specification Report) had been properly reviewed and approved by management.
 2. Determined whether changes to performance requirements were properly authorized and reflected in updated test scenarios.
 - B. For Daily Processing:
 1. Determined whether all performance and capacity requirements were properly approved by management by determining if source documents (e.g., Daily Processing Business System Report and Daily Processing Design Specification Report) had been properly reviewed and approved by management.
 2. Determined whether performance and capacity requirements in our sample had been included in the RTVM.
 3. Determined whether changes to performance and capacity requirements in our sample were appropriately authorized and updated.
- II. Determined whether the CADE 2 performance and capacity requirements were effectively tested.
 - A. Determined whether the environment used to conduct FIT was consistent with the production environment.
 - B. Determined whether CADE 2 Program tests were conducted, results analyzed, and defects adequately resolved.



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- III. Determined whether CADE 2 performance and capacity requirements that failed testing (*i.e.*, defects) were properly resolved.
 - A. Obtained and reviewed the End-of-Test Status Report which contains the final complete test results.
 - 1. Identified any performance/capacity issues identified during testing.
 - 2. Verified that all performance/capacity test cases passed, were waived, or deferred.
 - B. Verified that the RTVM was updated to include test results as passed, waived, or deferred.
 - C. Determined whether the CADE 2 executive handling of risks/issues identified during testing was appropriate.

Internal controls methodology

Internal controls relate to management's plans, methods, and procedures used to meet their mission, goals, and objectives. Internal controls include the processes and procedures for planning, organizing, directing, and controlling program operations. They include the systems for measuring, reporting, and monitoring program performance. We determined the following internal controls were relevant to our audit objective: the CADE 2 Project Management office's and the Enterprise System Testing organization's policies and procedures for effectively testing performance and capacity of developing systems. We evaluated these controls by interviewing management, reviewing the Project Management office's and the Enterprise System Testing organization's policies and procedures, as well as by reviewing test cases and other testing byproducts for tests run during FIT Phase I.



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Appendix II

Major Contributors to This Report

Alan R. Duncan, Assistant Inspector General for Audit (Security and Information Technology Services)
Danny Verneuille, Director
Carol Taylor, Audit Manager
Myron Gulley, Acting Audit Manager
Curtis Kirschner, Senior Auditor
Elton Jewell, Information Technology Specialist
Daniel Oakley, Information Technology Specialist



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Appendix III

Report Distribution List

Commissioner C
Office of the Commissioner – Attn: Chief of Staff C
Deputy Commissioner for Operations Support OS
Deputy Chief Information Officer for Operations OS:CTO
Associate Chief Information Officer, Applications Development OS:CTO:AD
Associate Chief Information Officer, Enterprise Operations OS:CTO:EO
Associate Chief Information Officer, Modernization - Program Management Office
OS:CTO:MP
Chief Counsel CC
National Taxpayer Advocate TA
Director, Office of Legislative Affairs CL:LA
Director, Office of Program Evaluation and Risk Analysis RAS:O
Office of Internal Controls OS:CFO:CPIC:IC
Audit Liaison: Director, Risk Management Division OS:CTO:SP:RM



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Appendix IV

Glossary of Terms

Term	Definition
Capacity Testing	A process of testing the program(s) under heavy load by putting a large number of inputs that are beyond the handling capacity of the application.
Computer Capacity	Capacity is interpreted in terms of system resources required to process peak workload demand, <i>i.e.</i> , Central Processing Unit, Input/Output, Memory, Disk space. Industry best practices indicate that modern mainframe systems are capable of running at high levels of system utilization and that it is the performance of higher priority workloads that should be managed, not the level of system utilization.
Computer Performance	Computer system performance relates to the response time of the system, <i>i.e.</i> , the amount of time it takes the system to perform a given unit of work. Typical units of work are transactions.
Enterprise Computing Center	Supports tax processing and information management through a data processing and telecommunications infrastructure.
Final Integration Testing	A system test consisting of integrated end-to-end testing of mainline tax processing systems to verify that new releases of interrelated systems and hardware platforms can collectively support the IRS business functions allocated to them.
Fiscal Year	A 12-consecutive-month period ending on the last day of any month, except December. The Federal Government's fiscal year begins on October 1 and ends on September 30.
Individual Master File	The IRS database that maintains transactions or records of individual tax accounts.
Integrated Data Retrieval System	IRS computer system capable of retrieving or updating stored information. It works in conjunction with a taxpayer's account records.



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Term	Definition
Mainframe	A powerful, multiuser computer capable of supporting many hundreds of thousands of users simultaneously.
Master File	The IRS database that stores various types of taxpayer account information. This database includes individual, business, and employee plans and exempt organizations data.
Performance Testing	Determines whether the system undergoing testing can effectively process transactions under expected normal and peak workload conditions, within acceptable response time thresholds. Performance testing will uncover any bottlenecks and capacity constraints that may not have occurred during normal functional testing.
Processing Year	The calendar year in which the tax return or document is processed by the IRS.
Requirements Traceability Verification Matrix	A tool showing the relationship between test requirements and test cases.
Scenario	Comprised of the event (<i>i.e.</i> , type of input data that results in an action), the entry point into the system (<i>e.g.</i> , Information Data Retrieval System, Integrated Submission and Remittance Processing, <i>etc.</i>), and the action.
Submission Processing Site	The data processing arm of the IRS. The sites process paper and electronic submissions, correct errors, and forward data to the Computing Centers for analysis and posting to taxpayer accounts.
Systems Acceptability Test	Testing performed by the Test, Assurance, and Documentation group to independently assess the quality of the application software by testing with controlled data to determine conformance of the system to customer requirements and to aid the customer and developer in determining the system's production readiness.
Test Case	A document specifying the test approach for a software feature or combination of features and the inputs, predicted results, and execution conditions for the associated tests.



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Term	Definition
Test Environment	The preliminary setup of hardware, resources, data, utilities, <i>etc.</i> , required to run a successful test.
Test Plan	A document that describes the objectives, scope, approach, and focus of a software testing effort.
Test Results	A documented summary or printed output resulting from the execution of the test plan.
Test Script	A set of instructions that is performed on a system under test to verify that the system performs as expected.



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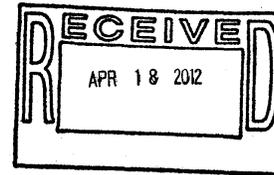
Appendix V

Management's Response to the Draft Report



CHIEF TECHNOLOGY OFFICER

DEPARTMENT OF THE TREASURY
INTERNAL REVENUE SERVICE
WASHINGTON, D.C. 20224



MEMORANDUM FOR DEPUTY INSPECTOR GENERAL FOR AUDIT

FROM: Terence V. Milholland *Terence V. Milholland*
Chief Technology Officer

SUBJECT: Draft Audit Report - Customer Account Data Engine 2 Performance and Capacity Is Sufficient, but Actions Are Needed to Improve Testing (audit #201120026) (e-trak #2012-30810)

Thank you for the opportunity to review your draft audit report and to discuss earlier draft report observations with the audit team.

I was pleased to read your comments and observations acknowledging that the IRS has successfully established a testing environment for CADE 2 representative of the production environment. Further, I appreciate your acknowledgement that establishing this testing environment allowed the Internal Revenue Service to obtain important data during the pre-production tests. These tests allowed us to fine tune our processes early and contributed to the successful launch of Daily Processing.

I agree with the two recommendations provided in the report, and the attachment details our planned actions to implement them. In the case of the first recommendation, however, it should be noted that the use of a specific product, such as an automated tool, does not ensure control over the execution of a test. I therefore appreciate TIGTA's flexibility in requiring the use of automated tools, only where appropriate.

We are committed to continuously improving our information technology systems and processes. We value your continued support and the assistance and guidance your team provides. If you have any questions, please contact me at (202) 622-6800 or Karen Mayr at (202) 283-0015.

Attachment



Customer Account Data Engine 2 Performance and Capacity Is Sufficient, but Actions Are Needed to Improve Testing

Draft Audit Report – The Customer Account Data Engine 2 Performance and Capacity Is Sufficient, but Actions Are Needed to Improve Testing (201120026)

RECOMMENDATION #1: The Associate Chief Information Officer, Applications Development, should ensure internal controls for testing performance and capacity requirements are formally and effectively implemented to ensure the traceability of these requirements through the performance testing process. This should include the use of integrated automated tools, when warranted by program and project size, to improve the consistency and completeness of testing performance and capacity requirements.

CORRECTIVE ACTION #1: The IRS agrees with this recommendation and will ensure internal controls for testing performance and capacity requirements are formally and effectively implemented to ensure the traceability of these requirements through the performance testing process. This will include the use of automated tools for testing, where appropriate.

IMPLEMENTATION DATE: December 31, 2012

RESPONSIBLE OFFICIAL: Associate Chief Information Officer, Applications Development

CORRECTIVE ACTION MONITORING PLAN: We enter accepted Corrective Actions into the Joint Audit Management Enterprise System (JAMES). These Corrective Actions are monitored on a monthly basis until completion.

RECOMMENDATION #2: The Associate Chief Information Officer, Applications Development, should develop procedures related to the access to and retention and maintenance of testing artifacts for performance testing.

CORRECTIVE ACTION #2: The IRS agrees with this recommendation and will review and, as warranted, develop procedures related to the access, retention, and maintenance of testing artifacts across all test projects.

IMPLEMENTATION DATE: December 31, 2012

RESPONSIBLE OFFICIAL: Associate Chief Information Officer, Applications Development

CORRECTIVE ACTION MONITORING PLAN: We entered accepted Corrective Actions into the Joint Audit Management Enterprise System (JAMES). These Corrective Actions are monitored on a monthly basis until completion.