



A Higher Education Business Solution Provider

UNIT TEST PLAN

FOR

POSCONNECT

DEFERRED PROCESSING

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2. GENERAL INFORMATION

Testers: Mahir Aydin, Mike Clark

Date: October 2011

Process to be tested: All POSConnect deferred processing functionality

3. PROJECT INFORMATION

Project: POSConnect Deferred Processing

Client: Sinclair Community College/Premiere Systems Support

4. BUSINESS REQUIREMENTS

The purpose of POSConnect deferred processing is to separate the funds verification wait time from the transaction processing wait time. It accomplishes this by sending a success response back to the cashier as soon as funds are determined to be available and pushing the actual transaction to a background listener. The background listener is started using a Colleague screen and it monitors the transaction log.

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5. TESTING OVERVIEW

The overall testing of POSConnect Deferred Processing is as follows:

5.1. Test Deferred Purchase Listener functionality

The starting/stopping/restarting of the deferred purchase listener is evaluated, it's logging functionality and ability to execute transactions in the background are tested.

5.2. Test Performance of Deferred vs. Non-Deferred processing

The performance of deferred processing will be compared with the performance of non-deferred processing. This will be done for a single transaction, and then followed up by a stress test scenario with multiple transactions.

5.3. Test Error Handling

The response from the deferred processing in times of failure will be tested. The deferred processing mode should not allow invalid transactions to go through.

6. DEFERRED PURCHASE LISTENER FUNCTIONALITY TESTS ON GENERIC SERVER

6.1. Starting the Listener

Test: Go to Colleague ST Application and then to the XDSP1 screen to start the listener. Enter Y on the "Start Deferred Process Phantom Field" to start the phantom listener.

Observation: From the UNIX prompt, check for running processes using `ps -ef` and look for `"/usr/ud71/bin/udt PHANTOM XTCSPS.START.DEFERRED.LISTENER"`. Also check to see if the UNIX process ID for this process matches the "Process ID" column in the XDSP1 screen.

Result: **Success.**

6.2. Stopping the Listener

Test: Go to Colleague ST Application and then to the XDSP1 screen to stop the listener. Enter Y on the "Stop Deferred Process Phantom Field" to stop the phantom listener.

Observation: From the UNIX prompt, check for running processes using `ps -ef` and look for `"/usr/ud71/bin/udt PHANTOM XTCSPS.START.DEFERRED.LISTENER"`. It should not exist. Also search by the process ID that was in the XDSP screen.

Result: **Success.**

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6.3. Starting a Second Listener

Test: Go to Colleague ST application, and then to the XSDP1 screen to start the listener, when it's already running. Enter Y on the "Start Deferred Process Phantom Field" to start the phantom listener for a second time. This should not be possible.

Observation: From the UNIX prompt, check for running processes using `ps -ef` and look for `"/usr/ud71/bin/udt PHANTOM XTCSPS.START.DEFERRED.LISTENER."` Then, also check to see if the Unix process ID for this process matches the "Process ID" column in the XSDP1 screen.

Result: **Success. It's impossible to start multiple listeners from the XSDP1 screen.**

6.4. Stopping Multiple Running Listeners

Test: Go to Colleague ST Application and then to the XSDP1 screen to stop the listener, when there are multiple listeners running. Enter Y on the "Stop Deferred Process Phantom Field" to stop the phantom listener.

Observation: From the Unix prompt, check for running processes using `ps -ef` and look for `"/usr/ud71/bin/udt PHANTOM XTCSPS.START.DEFERRED.LISTENER"` It should not exist. Also search by the process ID that was in the XSDP1 screen.

Result: **Success. It's impossible to start multiple listeners from the XSDP1 screen, so only the sole running listener will be stopped.**

6.5. Valid Deferred Purchase Through the Listener

Test: Send an INQ request to a test account, followed by a PURCH (deferred), and then followed by another INQ. The account ID used was 0000791 for this and all subsequent tests.

Observation: Check for the customer balance between the two INQ commands. The balance should change after a valid transaction. Then go to the XDPR screen and create the transaction report. The transaction should exist in the report, and the POSConnect listener should also receive a success message.

Result: **Success.**

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6.6. Deferred Purchase With Insufficient Funds

Test: Send an INQ request to a test account, followed by a PURCH (deferred), and then followed by another INQ. The PURCH amount must be greater than the available funds reported by INQ.

Observation: Check for the customer balance between the two INQ commands. The balance should stay the same, and the transaction should receive a failure “Insufficient Funds” message in POSConnect. Then go to the XDPR screen and create the transaction report. The transaction should not be in the report.

Result: **Success.**

6.7. Deferred Purchase With Previously Used Invoice Number

Test: Send an INQ request to a test account, followed by a PURCH (deferred), and then followed by another INQ. The PURCH invoice number must be the same as an earlier invoice.

Observation: Check for the customer balance between the two INQ commands. The balance should stay the same, and the transaction should receive a failure message in POSConnect. Then go to the XDPR screen and create the transaction report. The transaction should not be in the report.

Result: **Failure.** The response back to POSConnect listener is successful but the transaction does not go through due to the duplicate invoice number.

6.8. Deferred Purchase With Previously Used Alphanumeric Invoice String

Test: Send an INQ request to a test account, followed by a PURCH (deferred), and then followed by another INQ. The PURCH invoice number must be alphanumeric and it must be the same as an earlier invoice.

Observation: Check for the customer balance between the two INQ commands. The balance should stay the same, and the transaction should receive a failure message in POSConnect. Then go to the XDPR screen and create the transaction report. The transaction should not be in the report.

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Result: Failure. Unrelated to Deferred Processing. The transaction will process successfully with duplicate alphanumeric invoice strings whether the deferred processing option is turned on or off.

6.9. Deferred Purchase With Invalid Fund Source ID

Test: Send an INQ request to a test account, followed by a PURCH (deferred), and then followed by another INQ. The PURCH should use an invalid fund source

Observation: Check for the customer balance between the two INQ commands. The balance should stay the same, and the transaction should receive a failure message “Invalid Fund Source” in POSConnect. Then go to the XDPR screen and create the transaction report. The transaction should not be in the report.

Result: Success.

6.10. Deferred Purchase With Invalid AR Category

Test: Send an INQ request to a test account, followed by a PURCH (deferred), and then followed by another INQ. The PURCH should use an invalid AR category

Observation: Check for the customer balance between the two INQ commands. The balance should stay the same, and the transaction should receive a failure message “Invalid AR Category” in POSConnect. Then go to the XDPR screen and create the transaction report. The transaction should not be in the report.

Result: Success.

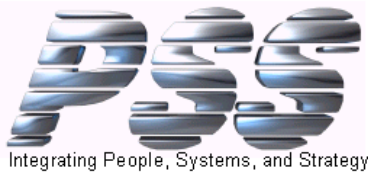
6.11. Deferred Refund

Test: Send an INQ request to a test account, followed by a PURCH (deferred), and then followed by another INQ. The amount should be negative, indicating a refund.

Observation: Check for the customer balance between the two INQ commands. The balance should increase by the refund amount.

Result: Success.

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6.12. Deferred Duplicate Transaction

Test: Send an INQ request to a test account, followed by a PURCH (deferred), and then send the exact same PURCH request again.

Observation: The second PURCH request should fail, with a status message saying that the transaction was successfully completed.

Result: **Success.**

6.13. Duplicate Pending Transaction

Test: Stop the deferred processing listener through XSDP1, and then send two identical PURCH requests.

Observation: The second PURCH request should fail, with a status message saying that the transaction is pending.

Result: **Success.**

6.14. Transaction with Unauthorized Date

Test: Send a PURCH request with a non-authorized invoice date. In the PSS test environment, student 791 is only authorized up to 2009.

Observation: The PURCH transaction should fail.

Result: **Failure.** The POSConnect listener reports success, however student balance is unchanged and the XDPR log indicates that the year is not authorized.

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7. DEFERRED PURCHASE LISTENER FUNCTIONALITY TESTS ON ISIS.SINCLAIR.EDU

7.1. Starting the Listener

Test: Go to Colleague ST Application and then to the XSDP1 screen to start the listener. Enter Y on the “Start Deferred Process Phantom Field” to start the phantom listener.

Observation: From the UNIX prompt, check for running processes using `ps -ef` and look for `“/usr/ud72/bin/udt PHANTOM XTCSP0S.START.DEFERRED.LISTENER”`. Also check to see if the UNIX process ID for this process matches the “Process ID” column in the XSDP1 screen.

Result: **Success.**

7.2. Stopping the Listener

Test: Go to Colleague ST Application and then to the XSDP1 screen to stop the listener. Enter Y on the “Stop Deferred Process Phantom Field” to stop the phantom listener.

Observation: From the UNIX prompt, check for running processes using `ps -ef` and look for `“/usr/ud72/bin/udt PHANTOM XTCSP0S.START.DEFERRED.LISTENER”`. It should not exist. Also search by the process ID that was in the XSD screen.

Result: **Success.**

7.3. Starting a Second Listener

Test: Go to Colleague ST application, and then to the XSDP1 screen to start the listener, when it’s already running. Enter Y on the “Start Deferred Process Phantom Field” to start the phantom listener for a second time. This should not be possible.

Observation: From the UNIX prompt, check for running processes using `ps -ef` and look for `“/usr/ud72/bin/udt PHANTOM XTCSP0S.START.DEFERRED.LISTENER.”` Then, also check to see if the UNIX process ID for this process matches the “Process ID” column in the XSDP1 screen.

Result: **Success. It’s impossible to start multiple listeners from the XSDP1 screen.**

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7.4. **Stopping Multiple Running Listeners**

Test: Go to Colleague ST Application and then to the XSDP1 screen to stop the listener, when there are multiple listeners running. Enter Y on the “Stop Deferred Process Phantom Field” to stop the phantom listener.

Observation: From the Unix prompt, check for running processes using `ps -ef` and look for “/usr/ud72/bin/udt PHANTOM XTCSPS.START.DEFERRED.LISTENER” It should not exist. Also search by the process ID that was in the XSDP1 screen.

Result: Success. It’s impossible to start multiple listeners from the XSDP1 screen, so only the sole running listener will be stopped.

7.5. **Valid Deferred Purchase Through the Listener**

Test: Send an INQ request to a test account, followed by a PURCH (deferred), and then followed by another INQ. The account ID used in this and all subsequent tests was 0715053.

Observation: Check for the customer balance between the two INQ commands. The balance should change after a valid transaction. Then go to the XDPR screen and create the transaction report. The transaction should exist in the report, and the POSConnect listener should also receive a success message.

Result: Success.

7.6. **Deferred Purchase With Insufficient Funds**

Test: Send an INQ request to a test account, followed by a PURCH (deferred), and then followed by another INQ. The PURCH amount must be greater than the available funds reported by INQ.

Observation: Check for the customer balance between the two INQ commands. The balance should stay the same, and the transaction should receive a failure “Insufficient Funds” message in POSConnect. Then go to the XDPR screen and create the transaction report. The transaction should not be in the report.

Result: Success.

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7.7. Deferred Purchase With Previously Used Invoice Number

Test: Send an INQ request to a test account, followed by a PURCH (deferred), and then followed by another INQ. The PURCH invoice number must be the same as an earlier invoice.

Observation: Check for the customer balance between the two INQ commands. The balance should stay the same, and the transaction should receive a failure message in POSConnect. Then go to the XDPR screen and create the transaction report. The transaction should not be in the report.

Result: Failure. The response back to POSConnect listener is successful but the transaction does not go through due to the duplicate invoice number.

7.8. Deferred Purchase With Previously Used Alphanumeric Invoice String

Test: Send an INQ request to a test account, followed by a PURCH (deferred), and then followed by another INQ. The PURCH invoice number must be alphanumeric and it must be the same as an earlier invoice.

Observation: Check for the customer balance between the two INQ commands. The balance should stay the same, and the transaction should receive a failure message in POSConnect. Then go to the XDPR screen and create the transaction report. The transaction should not be in the report.

Result: Failure. Unrelated to Deferred Processing. The transaction will process successfully with duplicate alphanumeric invoice strings whether the deferred processing option is turned on or off.

7.9. Deferred Purchase With Invalid Fund Source ID

Test: Send an INQ request to a test account, followed by a PURCH (deferred), and then followed by another INQ. The PURCH should use an invalid fund source

Observation: Check for the customer balance between the two INQ commands. The balance should stay the same, and the transaction should receive a failure message “Invalid Fund Source” in POSConnect. Then go to the XDPR screen and create the transaction report. The transaction should not be in the report.

Result: Success.

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7.10. Deferred Purchase With Invalid AR Category

Test: Send an INQ request to a test account, followed by a PURCH (deferred), and then followed by another INQ. The PURCH should use an invalid AR category

Observation: Check for the customer balance between the two INQ commands. The balance should stay the same, and the transaction should receive a failure message “Invalid AR Category” in POSConnect. Then go to the XDPR screen and create the transaction report. The transaction should not be in the report.

Result: **Success.**

7.11. Deferred Refund

Test: Send an INQ request to a test account, followed by a PURCH (deferred), and then followed by another INQ. The amount should be negative, indicating a refund.

Observation: Check for the customer balance between the two INQ commands. The balance should increase by the refund amount.

Result: **Success.**

7.12. Duplicate Pending Transaction

Test: Stop the deferred processing listener through XSDP1, and then send two identical PURCH requests.

Observation: The second PURCH request should fail, with a status message saying that the transaction is pending.

Result: **Success.**

7.13. Duplicate Insufficient Transactions

Test: Send two duplicate PURCH request with Transaction Amount Greater than available fund in a row.

Observation: Both PURCH request should fail, with a status message “Insufficient Funds”.

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Result: First transaction returns “Insufficient Funds” the second returns “This Transaction is deferred and Pending”

7.14. Duplicate Available Funds Transactions

Test: Send two duplicate PURCH request with Transaction Amount less than or equal available fund in a row.

Observation: First PURCH request should return “Success”, the second should fail with status “This transaction was previously COMPLETED”.

Result: **Success.**

7.15. Duplicate Insufficient Funds Followed by Available Funds Transactions

Test: Send two duplicate PURCH request with Transaction in a row. Send the first PUCRH with amount greater than the available fund. Then increase Student Balance to equal or greater than the amount of PURCH using Colleague FA application. Re-send the PURCH without changing any data.

Observation: First PURCH request should fail and return “Insufficient Funds”, the second should return with status “Success”.

Result: **Success.**

7.16. Transaction with Unauthorized Date

Test: Send a PURCH request with a non-authorized invoice date. In the Isis test environment, student 0715053 is not authorized for year 2014. An invoice date of 01012014 will not go through for this student.

Observation: The PURCH transaction should fail.

Result: **Failure.** The POSConnect listener reports success, however student balance is unchanged and the XDPR log indicates that the year is not authorized.

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7.17. Deferred Transaction Performance

Test: Send 5 valid PURCH valid requests for student 0715053 for a single item totaling \$1.00 when deferred processing is turned on. Repeat the same requests with deferred processing turned off.

Observation: Deferred processing transactions should take less time.

Results: As seen in the table below, deferred processing shaved off 10.42 seconds from the total transaction time, with all the savings coming from reduced FA duration enabled by the deferred processing option.

Non-deferred Processing				Deferred Processing			
Connect	Init	FA	Total	Connect	Init	FA	Total
0.20	0.76	13.13	14.98	0.16	0.74	2.37	3.27
0.23	0.72	13.61	14.58	0.16	0.74	2.42	3.32
0.16	0.71	13.75	14.63	0.15	0.73	2.44	3.31
0.18	0.72	14.07	14.97	0.16	0.78	2.82	3.76
0.17	0.72	14.63	15.53	0.17	0.72	2.55	3.45
Averages							
0.19	0.73	13.84	14.94	0.16	0.74	2.52	3.42

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