

AUTOMATED TELLER MACHINE

FIELD OF INVENTION

[001] The present invention relates broadly, but not exclusively, to automated teller machines (ATMs).

BACKGROUND

[002] Automated Teller Machines (hereinafter "ATMs") are well known. ATMs enable customers to perform banking transactions by interacting with a machine instead of a human bank teller. Examples of banking transactions that can be performed at ATMs include cash withdrawals, cash deposits, fund transfers between accounts, and account balance inquiries. During peak periods, it is common for long queues to form at ATMs as an ATM is currently only capable of serving one customer at a single point of time. A need therefore exists to provide a solution that seeks to address the problem of long waiting times at ATMs.

[003] Generally speaking, internal ATM architecture is fixed according to certain standards. Furthermore, ATMs are interconnected according to certain communication standards. An ATM network usually includes a centralized processor, a plurality of bank servers and a plurality of ATMs. Each ATM is connected to the centralized processor by a leased line or dial-up connection of an Internet Service Provider (ISP). Each ATM establishes one single connection with the centralized processor at a single point of time. The plurality of bank servers are connected to the centralized processor.

SUMMARY

[004] According to a first aspect, there is provided an automated teller machine (ATM) comprising: a modem module comprising a plurality of ports that are concurrently connected to a remote central processor module of an ATM network; and an ATM processor module comprising a plurality of network interface cards, wherein each network interface card is connected to a unique one of the plurality of ports such

that multiple concurrent ATM transaction commands can be routed between the ATM processor module and the remote central processor module.

[005] According to a second aspect, there is provided a method comprising: concurrently connecting a plurality of ports of a multi-port modem module of an automated teller machine (ATM) to a remote central processor module of an ATM network; and connecting each one of a plurality of network interface cards of an ATM processor module of the ATM to a unique one of the plurality of ports such that multiple concurrent ATM transaction commands can be routed between the ATM processor module and the remote central processor module

[006] According to a third aspect, there is provided a method for handling multiple requests at an automated teller machine (ATM), comprising the steps of: receiving, at substantially the same time: (i) a first request from a first user at a first input module of the ATM; and (ii) a second request from a second user at a second input module of the ATM; concurrently transmitting the first and second requests from an ATM processor module of the ATM to a remote central processor module of an ATM network via a modem module of the ATM, wherein the ATM modem module comprises a plurality of ports that are concurrently connected to the remote central processor module, and wherein the ATM processor module comprises a plurality of network interface cards that are each connected to a unique one of the plurality of ports; receiving, from the remote central processor module, a first and second response corresponding to the first and second request respectively; and processing the first and second responses using the ATM processor module.

BRIEF DESCRIPTION OF THE DRAWINGS

[007] Embodiments and implementations are provided by way of example only, and will be better understood and readily apparent to one of ordinary skill in the art from the following written description, read in conjunction with the drawings, in which:

[008] Figure 1 shows a schematic of an ATM network architecture, according to an example embodiment;

[009] Figure 2 shows a schematic of an internal structure of an ATM, according to an example embodiment;

[0010] Figure 3 shows a schematic of a multi-request model of an ATM, according to an example embodiment;

[0011] Figure 4 shows a schematic of a multi-response model of an ATM, according to an example embodiment; and

[0012] Figure 5 shows a flow chart illustrating a method for handling multiple requests at an automated teller machine (ATM), according to an example embodiment.

DETAILED DESCRIPTION

[0013] Embodiments will be described, by way of example only, with reference to the drawings. Like reference numerals and characters in the drawings refer to like elements or equivalents.

[0014] Some portions of the description which follows are explicitly or implicitly presented in terms of algorithms and functional or symbolic representations of operations on data within a computer memory. These algorithmic descriptions and functional or symbolic representations are the means used by those skilled in the data processing arts to convey most effectively the substance of their work to others skilled in the art. An algorithm is here, and generally, conceived to be a self-consistent sequence of steps leading to a desired result. The steps are those requiring physical manipulations of physical quantities, such as electrical, magnetic or optical signals capable of being stored, transferred, combined, compared, and otherwise manipulated.

[0015] Unless specifically stated otherwise, and as apparent from the following, it will be appreciated that throughout the present specification, discussions utilizing terms such as “receiving”, “scanning”, “calculating”, “determining”, “replacing”, “generating”, “initializing”, “outputting”, or the like, refer to the action and processes of a computer system, or similar electronic device, that manipulates and transforms data represented as physical quantities within the computer system into other data similarly represented as physical quantities within the computer system or other information storage, transmission or display devices.

[0016] The present specification also discloses apparatus for performing the operations of the methods. Such apparatus may be specially constructed for the required purposes, or may comprise a computer or other device selectively activated or reconfigured by a computer program stored in the computer. The algorithms and displays presented herein are not inherently related to any particular computer or other apparatus. Various machines may be used with programs in accordance with the teachings herein. Alternatively, the construction of more specialized apparatus to perform the required method steps may be appropriate. The structure of a computer suitable for executing the various methods / processes described herein will appear from the description below.

[0017] In addition, the present specification also implicitly discloses a computer program, in that it would be apparent to the person skilled in the art that the individual steps of the method described herein may be put into effect by computer code. The computer program is not intended to be limited to any particular programming language and implementation thereof. It will be appreciated that a variety of programming languages and coding thereof may be used to implement the teachings of the disclosure contained herein. Moreover, the computer program is not intended to be limited to any particular control flow. There are many other variants of the computer program, which can use different control flows without departing from the spirit or scope of the invention.

[0018] Furthermore, one or more of the steps of the computer program may be performed in parallel rather than sequentially. Such a computer program may be stored on any computer readable medium. The computer readable medium may include storage devices such as magnetic or optical disks, memory chips, or other storage devices suitable for interfacing with a computer. The computer readable medium may also include a hard-wired medium such as exemplified in the Internet system, or wireless medium such as exemplified in the GSM mobile telephone system. The computer program when loaded and executed on such a computer effectively results in an apparatus that implements the steps of the preferred method.

[0019] Embodiments relate to an automated teller machine (ATM) that is capable of performing multiple ATM functions for multiple users simultaneously. The ATM may include (i) a modem module having a plurality of ports that are concurrently connected to a remote central processor module of an ATM network and (ii) an ATM processor module including a plurality of network interface cards. Each network interface card is

connected to a unique one of the plurality of ports such that multiple concurrent (i.e. simultaneous) ATM transaction commands can be routed between the ATM processor module and the remote central processor module.

[0020] In an example scenario, User A places a request A for cash withdrawal using ATM card. Simultaneously, User B places a request B for balance enquiry and User C places a request C for cash withdrawal. The ATM processes requests A, B and C in parallel by, among other steps, transmitting and receiving multiple ATM transaction commands corresponding to the requests A, B and C between the ATM processor module and the remote central processor module. In this manner User A receives his/her requested amount of cash and at same time User B sees his/her account balance, and User C receives his/her requested amount of cash.

[0021] Embodiments seek to fully optimize the use of current ATM architecture by providing multiple ATM functions for multiple users simultaneously. Advantageously, ATMs according to embodiments are able to serve more than one customer at a single point of time to reduce waiting times at ATMs especially during peak periods.

[0022] Figure 1 shows a schematic of an automated teller machine (ATM) network architecture, according to an example embodiment. The ATM network 100 includes a centralized processor 102, a plurality of bank servers 104a, 104b, 104c ... 104n, and a plurality of ATMs 106a, 106b, 106c ... 106n. Unlike the prior art where each ATM establishes one single connection with the centralized processor at a single point of time, each ATM 106a, 106b, 106c ... 106n establishes multiple connections concurrently with the centralized processor 102. In Figure 1, each ATM 106a, 106b, 106c ... 106n establishes four simultaneous connections with the centralized processor 102. It will be appreciated that there can be less or more than four concurrent connections between each ATM and the centralized processor 102. The plurality of bank servers 104a, 104b, 104c ... 104n are each connected to the centralized processor 102 as per procedures known in the art. In the following description, the term “connect” can refer to a direct or indirect communication or data link.

[0023] Figure 2 shows a schematic of an internal structure of an ATM, according to an example embodiment. In the following description, the term “module” (e.g. ATM processor module, remote central processor module, transaction queue manager module, etc.) can refer to software, a hardware element, or a combination of both.

The ATM 200 includes an ATM processor module 202 and a multi-port modem 208. The ATM processor module 202 may have two logical processors per core, each of which has its own processor architectural state capable of executing multiple processes or threads concurrently (i.e. Hyper-Threading processor).

[0024] The modem module 208 includes a plurality of ports that are concurrently connected to a remote central processor module (such as centralized processor 102) of an ATM network. In one embodiment, each of the plurality of ports has a unique Internet Protocol address (IP address).

[0025] The ATM processor module 202 includes a plurality of network interface cards (not shown in Figure 2 but shown in Figure 3 as NIC1, NIC2, NIC3 and NIC4). Each network interface card is connected to a unique one of the plurality of ports such that multiple concurrent ATM transaction commands can be routed between the ATM processor module 202 and the remote central processor module.

[0026] The ATM 200 may further comprise a plurality of user interfaces, e.g. 206a, 206b, 206c and 206d. Each user interface includes one or more input/output modules (I/O modules) and each I/O module is connected to a unique one of the plurality of network interface cards of the ATM processor module 202. Examples of the I/O modules include, but are not limited to: an ATM card reader 212, an input keypad 214, a PIN pad 216 and a display module 220.

[0027] Each of the multiple concurrent ATM transaction commands includes a transaction request or a transaction response. Transaction requests are routed from the ATM processor module 202 to the remote central processor module, and transaction responses are routed from the remote central processor module to the ATM processor module 202. An example of a common transaction request is a cash dispense request. Typically, a cash dispense request has a corresponding timestamp (i.e. a time and date of the cash dispense request made at the ATM). Other transaction requests include, but are not limited to: cash deposits, fund transfers between accounts, and account balance inquiries.

[0028] The ATM 200 further includes a transaction queue manager module 204 that is connected to the ATM processor module 202. The transaction queue manager module 204 is configured to hold multiple cash dispense requests in association with their corresponding timestamps.

[0029] The ATM processor module 202 is configured to determine whether a transaction request includes an approved request and, in the affirmative, whether the approved request includes a cash dispense request. The ATM processor module 202 is further configured to transmit only approved cash dispense requests to the transaction queue manager module 204.

[0030] The ATM 200 may further comprise a vault module 210 that is connected to the transaction queue manager module 204. The transaction queue manager module 204 is configured to release each of the held multiple cash dispense requests to the vault module 210 based on the corresponding timestamp of each of the held multiple cash dispense requests. The vault module 210 includes a cash dispenser module 211 that is configured to dispense cash in response to receipt of the each of the held multiple cash dispense requests from the transaction queue manager module. There is physically only one cash dispenser module 211 in the ATM 200. However, as the ATM 200 is capable of serving multiple concurrent transaction requests (e.g. cash dispense/withdrawal requests), there are four virtual cash dispensers (shown in dashed boxes in Figure 2) in the ATM 200.

[0031] Figure 3 shows a schematic of a multi-request model 300 of an ATM, according to an example embodiment. Four customers (ACTOR1, ACTOR2, ACTOR3, ACTOR4) visit an ATM at substantially the same time. The ATM is capable of serving multiple concurrent transaction requests, e.g. cash dispense/withdrawal, cash deposits, fund transfers between accounts, and account balance inquiries.

[0032] The customers insert their respective ATM cards into their respective ATM card readers 306a, 306b, 306c and 306d (i.e. Actor 1 inserts his ATM card into card reader 306a, etc.). Each ATM card reader is connected to a unique one of a plurality of network interface cards (e.g. NIC1, NIC2, NIC3, NIC4) of ATM processor module 302 (i.e. Card reader 306a is connected to NIC1, Card reader 306b is connected to NIC2, Card reader 306c is connected to NIC3 and Card reader 306d is connected to NIC4). This connection arrangement is permanent in the sense that for example, card reader 306a is not disconnected from NIC1 and re-connected to NIC2, NIC3 or NIC4 at a later stage.

[0033] Each network interface card (e.g. NIC1, NIC2, NIC3, NIC4) is connected to a unique one of a plurality of ports (e.g. LAN1, LAN2, LAN3, LAN4) of a multi-port modem 308. As shown in Figure 3, NIC1 is connected to LAN1, NIC2 is connected to

LAN2, NIC3 is connected to LAN3 and NIC4 is connected to LAN4. This connection arrangement is permanent in the sense that for example, LAN1 is not disconnected from NIC1 and re-connected to LAN 2, LAN 3 or LAN 4 at a later stage. In this manner, multiple concurrent ATM transaction requests (e.g. REQUEST1, REQUEST2, REQUEST3, and REQUEST4) can be routed between the ATM processor module 302 and a remote central processor module 310.

[0034] The remote central processor module 310 in turn routes the ATM transaction requests (e.g. REQUEST1, REQUEST2, REQUEST3 and REQUEST4) to the respective bank servers (e.g. BANK1, BANK2, BANK3 and BANK4) as known in the art.

[0035] Figure 4 shows a schematic of a multi-response model 400 of an ATM, according to an example embodiment. In response to the multiple concurrent ATM transaction requests (e.g. REQUEST1, REQUEST2, REQUEST3, and REQUEST4), each bank server (e.g. 404a, 404b, 404c and 404d) may return a corresponding transaction response (e.g. RESPONSE1, RESPONSE2, RESPONSE3, RESPONSE4). For example, a response to a cash dispense request can be an approval response if there are sufficient funds in a customer's bank account. Remote central processor module 410 receives the transaction responses and routes the transaction responses to the corresponding port (e.g. LAN1, LAN2, LAN3, LAN4) of multi-port modem 408. As each network interface card (e.g. NIC1, NIC2, NIC3, NIC4) of ATM processor module 402 is connected to a unique one of a plurality of ports (i.e. LAN1, LAN2, LAN3, LAN4, respectively) of the multi-port modem 408, the corresponding transaction response is received at the associated network interface card. In other words, RESPONSE1 is received at NIC1, RESPONSE2 is received at NIC2, RESPONSE3 is received at NIC3 and RESPONSE4 is received at NIC4.

[0036] At step 412, the ATM processor module 402 is configured to determine whether the transaction request includes an approved request.

[0037] At step 414, the ATM processor module 402 is configured to determine whether the approved request includes a cash dispense request. In other words, the ATM processor module 402 is configured to determine whether, for example RESPONSE1 is an approval response to a cash dispense request. In the affirmative, the ATM processor module 402 is further configured to transmit the approved cash dispense request or the approval response to a transaction queue manager module 416.

[0038] The ATM may comprise a vault module 418 that is connected to the transaction queue manager module 416. The transaction queue manager module 416 is configured to release each of the held multiple cash dispense requests to the vault module 418 based on a corresponding timestamp of each of the held multiple cash dispense requests.

[0039] In an implementation, the transaction queue manager module 416 is configured to release each of the held multiple cash dispense requests to the vault module 418 using a first in, first out (FIFO) method based on the corresponding timestamp of each of the held multiple cash dispense requests. In other words, a first cash dispense request with an earlier timestamp is released to the vault module 418 before a subsequent cash dispense request with a later timestamp.

[0040] In an exemplary embodiment, there is provided a method including a step of concurrently connecting a plurality of ports of a multi-port modem module of an automated teller machine (ATM) to a remote central processor module of an ATM network; and another step of connecting each one of a plurality of network interface cards of an ATM processor module of the ATM to a unique one of the plurality of ports. In this manner, multiple concurrent ATM transaction commands can be routed between the ATM processor module and the remote central processor module. The two steps described above can be performed in any order. In this description, the term “connecting” can refer to directly or indirectly linking two elements to enable communication between the two elements. The method may further comprise the step of assigning a unique Internet Protocol address (IP address) to each of the plurality of ports.

[0041] The method may further comprise connecting each one of a plurality of input/output modules (I/O modules) of the ATM to a unique one of the plurality of network interface cards. Each of the plurality of I/O modules includes but is not limited to: an ATM card reader, an input keypad or a display module.

[0042] Each of the multiple concurrent ATM transaction commands includes but is not limited to a transaction request or a transaction response. The method may further comprise routing transaction requests from the ATM processor module to the remote central processor module, and routing transaction responses from the remote central processor module to the ATM processor module.

[0043] A transaction request may comprise a cash dispense request with a corresponding timestamp. Accordingly, the method may further comprise the steps of: (a) connecting a transaction queue manager module of the ATM to the ATM processor module, and (b) configuring the transaction queue manager module to hold multiple cash dispense requests in association with their corresponding timestamps.

[0044] The method may further comprise the step of configuring the ATM processor module to: (i) determine whether the transaction request includes an approved request (i.e. an approval response is received) and whether the approved request includes a cash dispense request, and (ii) transmit only an approved cash dispense request to the transaction queue manager module.

[0045] The method may further comprise the step of: (a) connecting a vault module of the ATM to the transaction queue manager module; and (b) configuring the transaction queue manager module to release each of the held multiple cash dispense requests to the vault module based on the corresponding timestamp of each of the held multiple cash dispense requests. The method may further comprise the step of configuring the transaction queue manager module to release each of the held multiple cash dispense requests to the vault module using a first in, first out (FIFO) method based on the corresponding timestamp of each of the held multiple cash dispense requests.

[0046] The method may further comprise the step of configuring a cash dispenser module of the vault module to dispense cash in response to receipt of the each of the held multiple cash dispense requests from the transaction queue manager module.

[0047] Figure 5 shows a flow chart illustrating a method 500 for handling multiple requests at an automated teller machine (ATM), according to an example embodiment. At step 502, a first request from a first user is received at a first input module of the ATM and, at substantially the same time, a second request is received from a second user at a second input module of the ATM.

[0048] At step 504, the first and second requests are concurrently transmitted from an ATM processor module of the ATM to a remote central processor module of an ATM network via a modem module of the ATM. The ATM modem module (similar to ATM modem module 208 described above) comprises a plurality of ports that are concurrently connected to the remote central processor module. The ATM processor module (similar to ATM processor module 202 described above) is communicatively

coupled to the first and second input modules and comprises a plurality of network interface cards that are each connected to a unique one of the plurality of ports.

[0049] At step 506, a first response corresponding to the first request and a second response corresponding to the second request are received from the remote central processor module. At step 508, the first and second responses are processed using the ATM processor module.

[0050] The first and second requests may be either: a cash dispense request or a non-dispense request. The non-dispense request may be a fund transfer request or an account balance inquiry.

[0051] In an implementation, the first and second responses are concurrently processed using the ATM processor module on a condition that the first request comprises the cash dispense request and the second request comprises the non-dispense request (or vice-versa).

[0052] On the other hand, the first and second responses are processed using the ATM processor module in an order that is based on a respective timestamp corresponding to the first and second request on a condition that both the first and second requests comprise the cash dispense request. In contrast to a scenario when there is only one cash dispense request, a scenario having multiple cash dispense requests has to be handled differently. Specifically, multiple cash dispense requests have to be processed sequentially as most ATMs only have a single vault and cash dispenser.

[0053] It will be appreciated by a person skilled in the art that numerous variations and/or modifications may be made to the present invention as shown in the specific embodiments without departing from the spirit or scope of the invention as broadly described. The present embodiments are, therefore, to be considered in all respects to be illustrative and not restrictive.

CLAIMS

1. An automated teller machine (ATM) comprising:
a modem module comprising a plurality of ports that are concurrently connected to a remote central processor module of an ATM network; and
an ATM processor module comprising a plurality of network interface cards, wherein each network interface card is connected to a unique one of the plurality of ports such that multiple concurrent ATM transaction commands can be routed between the ATM processor module and the remote central processor module.
2. The ATM as claimed in claim 1, further comprising a plurality of input/output modules (I/O modules), wherein each I/O module is connected to a unique one of the plurality of network interface cards.
3. The ATM as claimed in claim 2, wherein each of the plurality of I/O modules comprises: an ATM card reader, an input keypad or a display module.
4. The ATM as claimed in any one of the preceding claims, wherein each of the multiple concurrent ATM transaction commands comprises: a transaction request or a transaction response.
5. The ATM as claimed in claim 4, wherein the transaction request is routed from the ATM processor module to the remote central processor module, and wherein the transaction response is routed from the remote central processor module to the ATM processor module.
6. The ATM as claimed in claim 5, wherein the transaction request comprises a cash dispense request with a corresponding timestamp.
7. The ATM as claimed in claim 6, further comprising a transaction queue manager module that is connected to the ATM processor module and is configured to hold multiple cash dispense requests in association with their corresponding timestamps.
8. The ATM as claimed in claim 7, wherein the ATM processor module is configured to: (i) determine whether the transaction request comprises an approved request and whether the approved request comprises a cash dispense request, and (ii)

transmit only an approved cash dispense request to the transaction queue manager module.

9. The ATM as claimed in claim 7 or 8, further comprising a vault module that is connected to the transaction queue manager module, wherein the transaction queue manager module is configured to release each of the held multiple cash dispense requests to the vault module based on the corresponding timestamp of each of the held multiple cash dispense requests.

10. The ATM as claimed in claim 9, wherein the transaction queue manager module is configured to release each of the held multiple cash dispense requests to the vault module using a first in, first out (FIFO) method based on the corresponding timestamp of each of the held multiple cash dispense requests.

11. The ATM as claimed in claim 10, wherein the vault module comprises a cash dispenser module that is configured to dispense cash in response to receipt of the each of the held multiple cash dispense requests from the transaction queue manager module.

12. The ATM as claimed in any one of the preceding claims, wherein each of the plurality of ports has a unique Internet Protocol address (IP address).

13. A method comprising:

concurrently connecting a plurality of ports of a multi-port modem module of an automated teller machine (ATM) to a remote central processor module of an ATM network; and

connecting each one of a plurality of network interface cards of an ATM processor module of the ATM to a unique one of the plurality of ports such that multiple concurrent ATM transaction commands can be routed between the ATM processor module and the remote central processor module.

14. The method as claimed in claim 13, further comprising connecting each one of a plurality of input/output modules (I/O modules) of the ATM to a unique one of the plurality of network interface cards.

15. The method as claimed in claim 14, wherein each of the plurality of I/O modules comprises: an ATM card reader, an input keypad or a display module.

16. The method as claimed in any one of claims 13 to 15, wherein each of the multiple concurrent ATM transaction commands comprises: a transaction request or a transaction response.

17. The method as claimed in claim 16, further comprising routing the transaction request from the ATM processor module to the remote central processor module, and routing the transaction response from the remote central processor module to the ATM processor module.

18. The method as claimed in claim 17, wherein the transaction request comprises a cash dispense request with a corresponding timestamp.

19. The method as claimed in claim 18, further comprising: connecting a transaction queue manager module of the ATM to the ATM processor module, and configuring the transaction queue manager module to hold multiple cash dispense requests in association with their corresponding timestamps.

20. The method as claimed in claim 19, further comprising configuring the ATM processor module to: (i) determine whether the transaction request comprises an approved request and whether the approved request comprises a cash dispense request, and (ii) transmit only an approved cash dispense request to the transaction queue manager module.

21. The method as claimed in claim 19 or 20, further comprising:
connecting a vault module of the ATM to the transaction queue manager module; and
configuring the transaction queue manager module to release each of the held multiple cash dispense requests to the vault module based on the corresponding timestamp of each of the held multiple cash dispense requests.

22. The method as claimed in claim 21, further comprising configuring the transaction queue manager module to release each of the held multiple cash dispense requests to the vault module using a first in, first out (FIFO) method based on the corresponding timestamp of each of the held multiple cash dispense requests.

23. The method as claimed in claim 22, configuring a cash dispenser module of the

vault module to dispense cash in response to receipt of the each of the held multiple cash dispense requests from the transaction queue manager module.

24. The method as claimed in any one of claims 13 to 23, further comprising assigning a unique Internet Protocol address (IP address) to each of the plurality of ports.

25. A method for handling multiple requests at an automated teller machine (ATM), comprising the steps of:

receiving, at substantially the same time:

a first request from a first user at a first input module of the ATM; and

a second request from a second user at a second input module of the ATM;

concurrently transmitting the first and second requests from an ATM processor module of the ATM to a remote central processor module of an ATM network via a modem module of the ATM, wherein the ATM modem module comprises a plurality of ports that are concurrently connected to the remote central processor module, and wherein the ATM processor module comprises a plurality of network interface cards that are each connected to a unique one of the plurality of ports;

receiving, from the remote central processor module, a first and second response corresponding to the first and second request respectively; and

processing the first and second responses using the ATM processor module.

26. The method as claimed in claim 25, wherein the first and second requests comprise either: a cash dispense request or a non-dispense request.

27. The method as claimed in claim 26, wherein the non-dispense request comprises either: a fund transfer request or an account balance inquiry.

28. The method as claimed in claim 26, wherein the first and second responses are concurrently processed using the ATM processor module on a condition that the first request comprises the cash dispense request and the second request comprises the non-dispense request.

29. The method as claimed in claim 26, wherein the first and second responses are processed using the ATM processor module in an order that is based on a respective

timestamp corresponding to the first and second request on a condition that both the first and second requests comprise the cash dispense request.