ERP Course: Enterprise Application Integration
Readings: Chapter 3 from Gustavo Alonso et al

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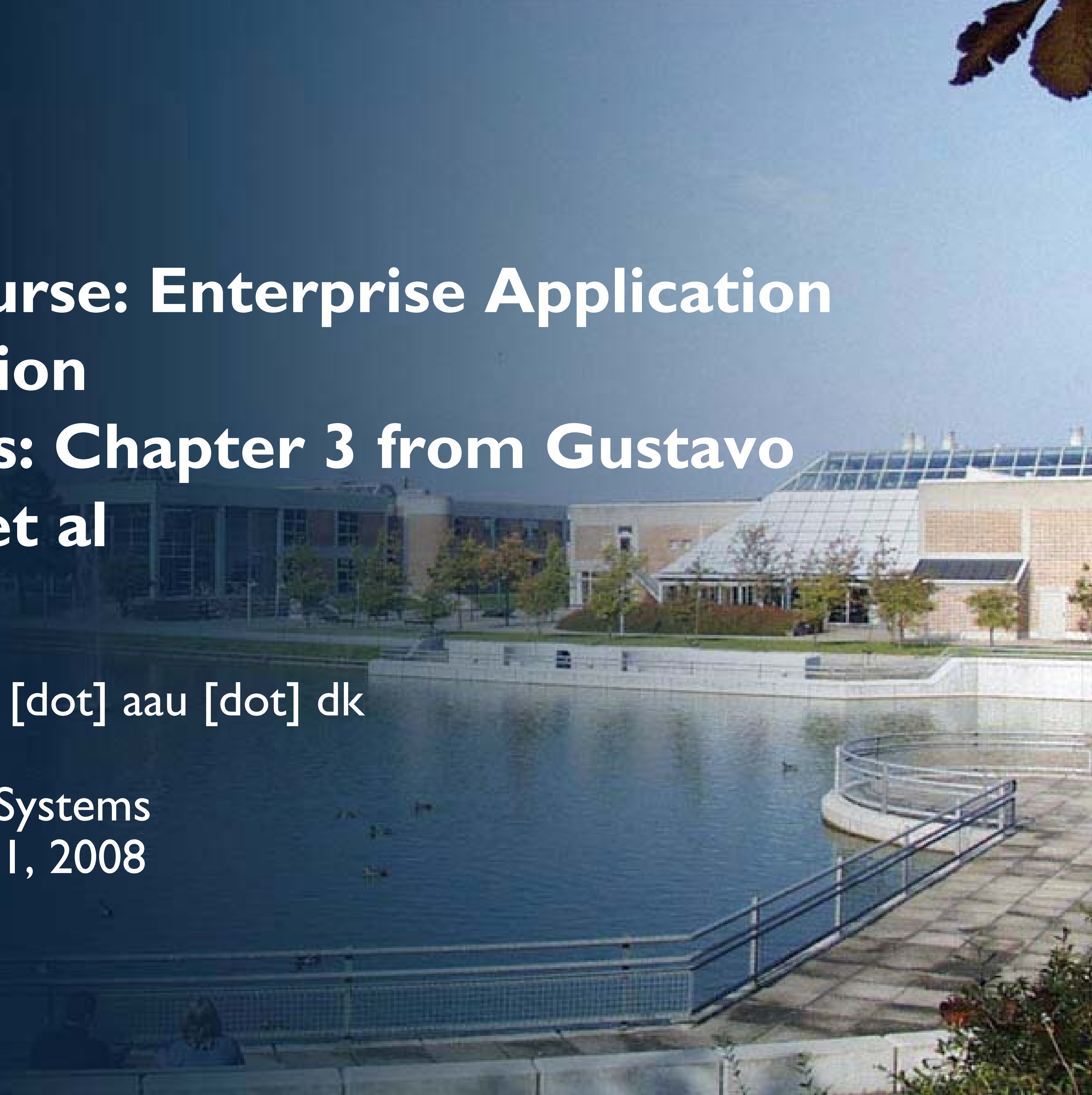
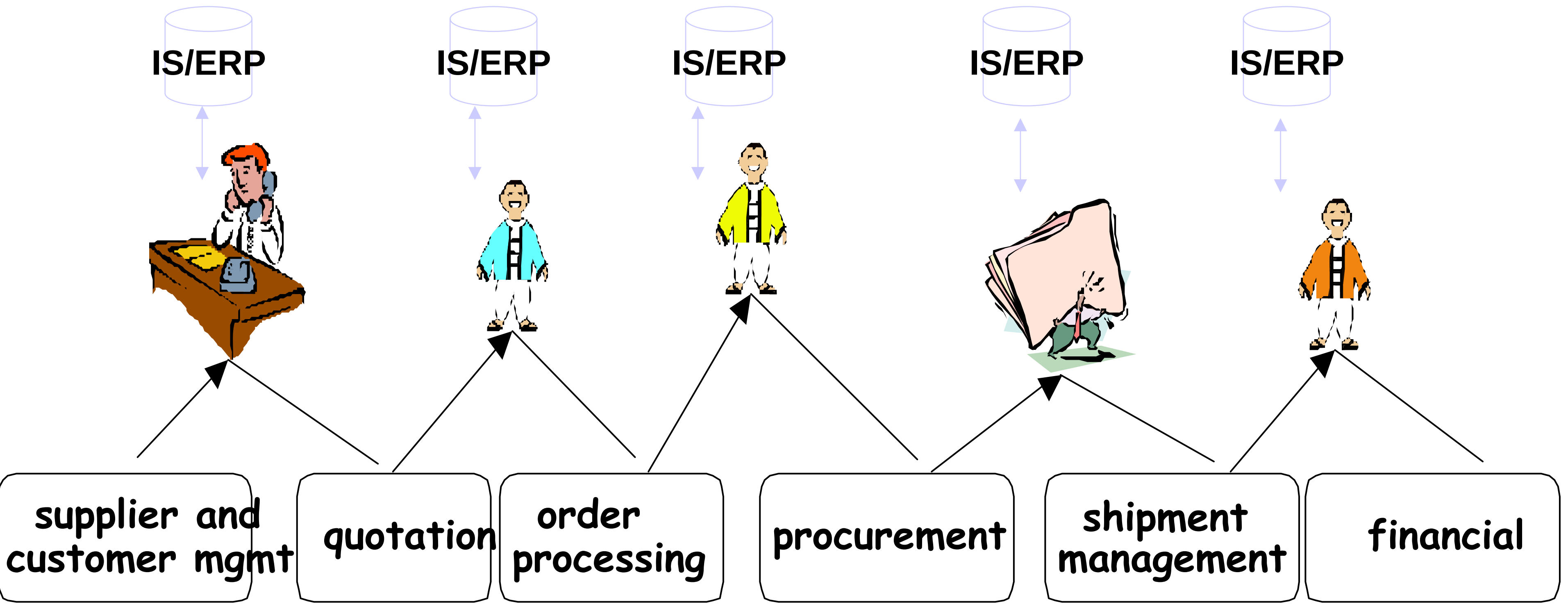
5.2.03
Information Systems
November 11, 2008




IS/ERP
IS/ERP
IS/ERP
IS/ERP
IS/ERP
supplier and customer mgmt
quotation
order processing
procurement
shipment management
financial

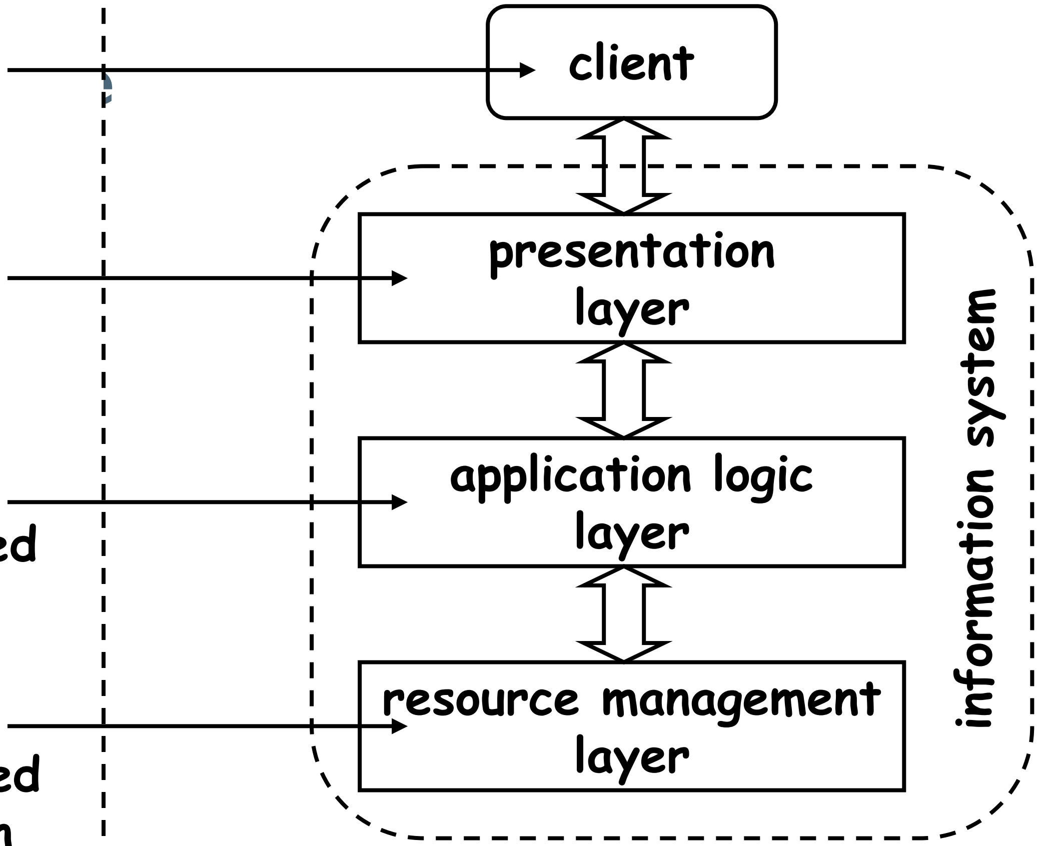
top-down design

1. define access channels and client platforms

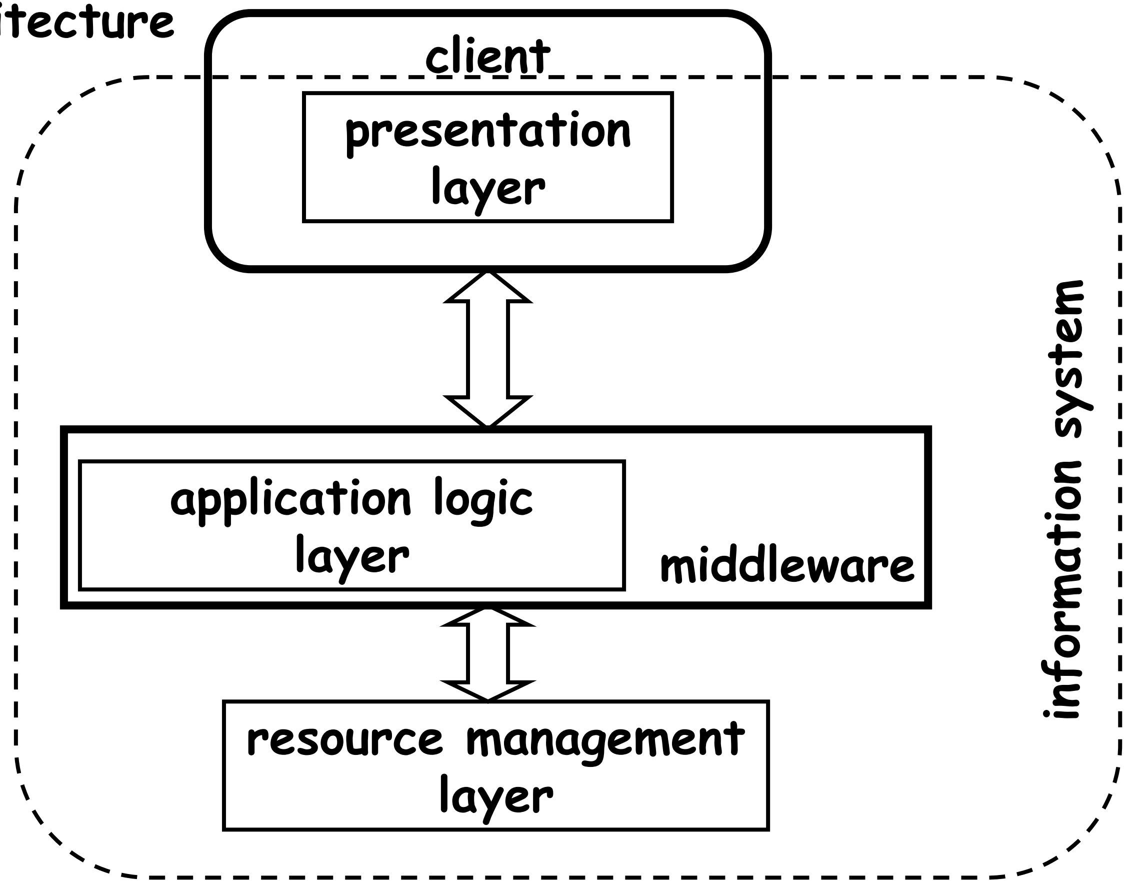
2. define presentation formats and protocols for the selected clients and protocols

3. define the functionality necessary to deliver the contents and formats needed at the presentation layer

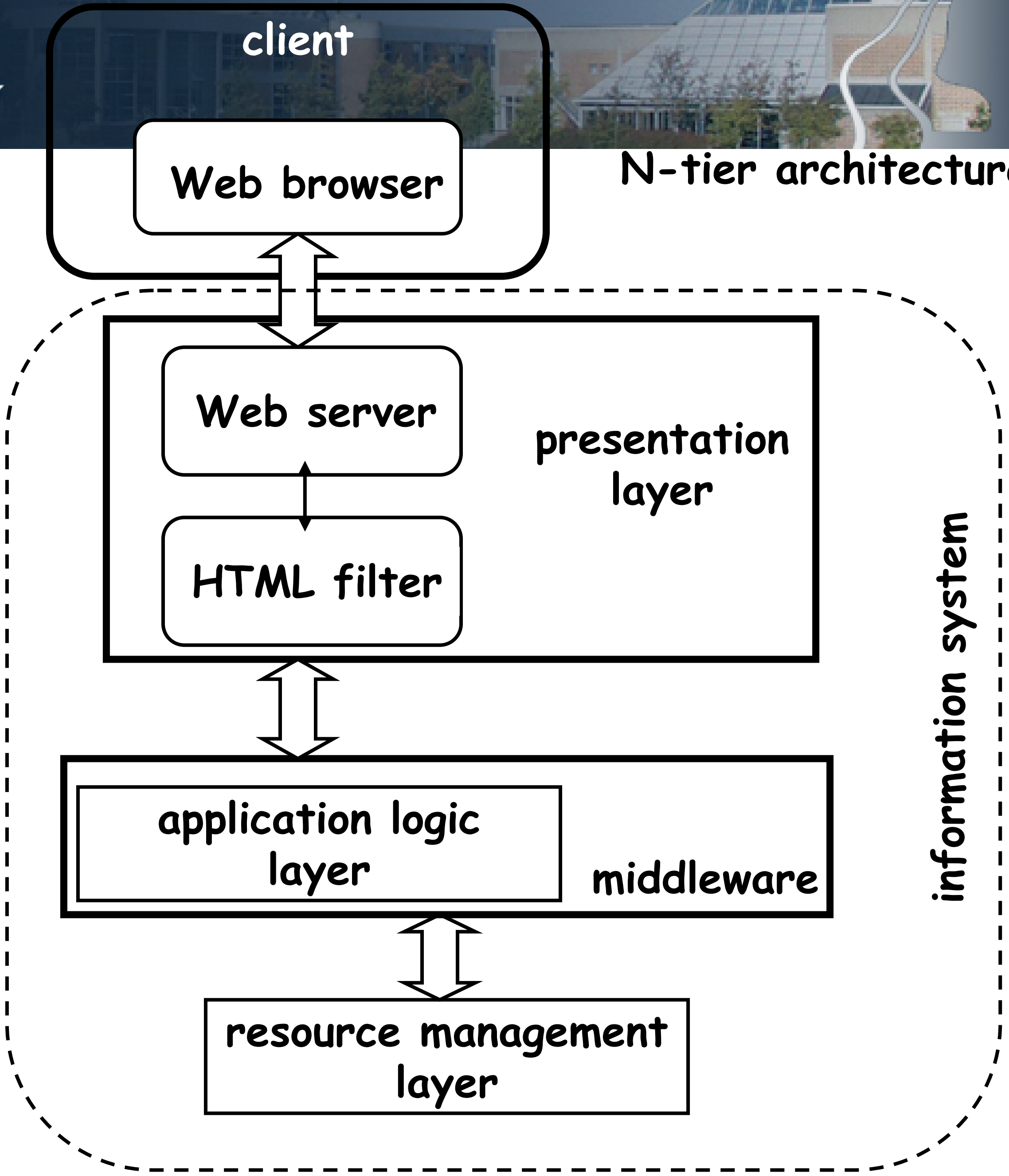
4. define the data sources and data organization needed to implement the application logic



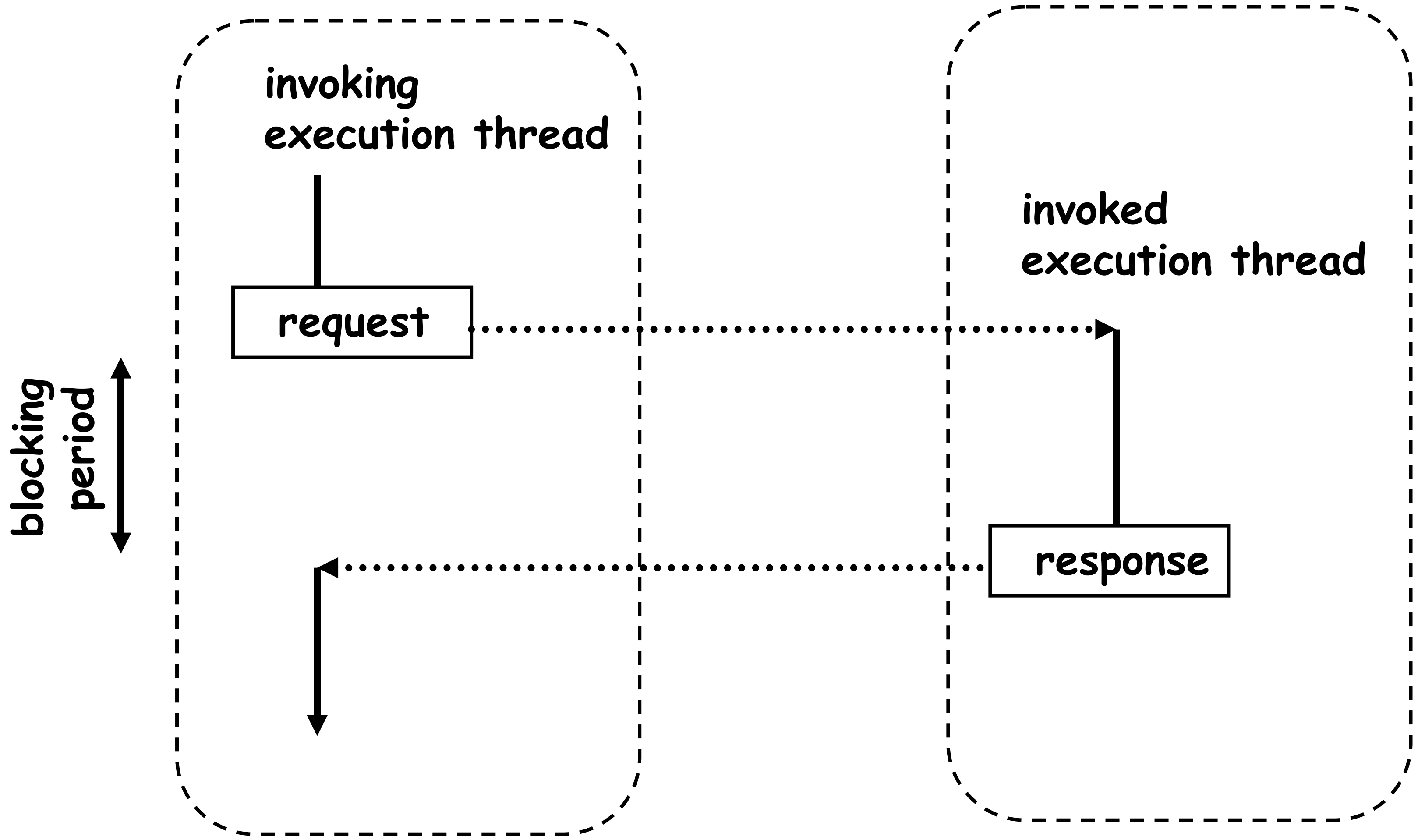
3-tier architecture



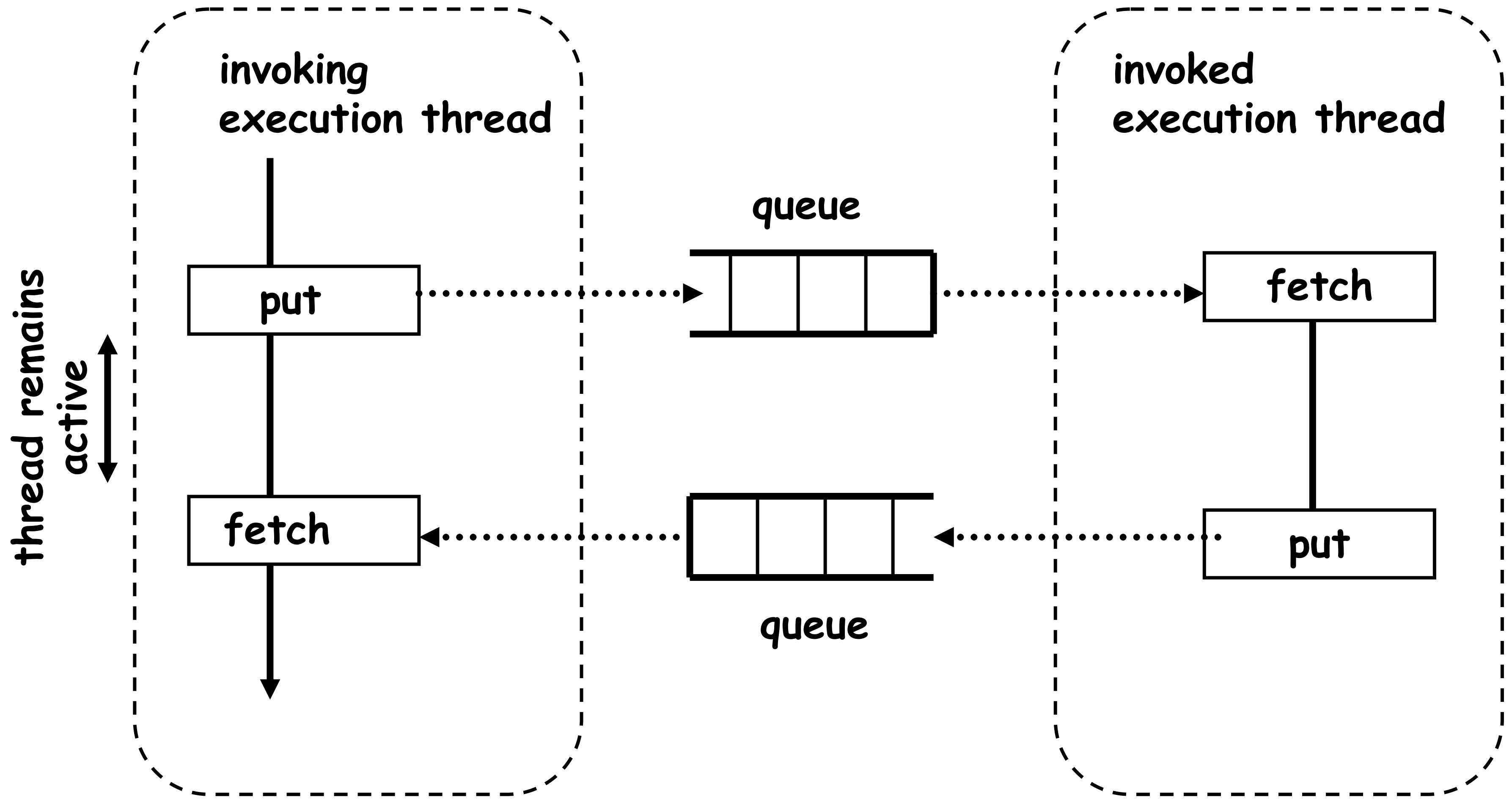
N-tier architecture



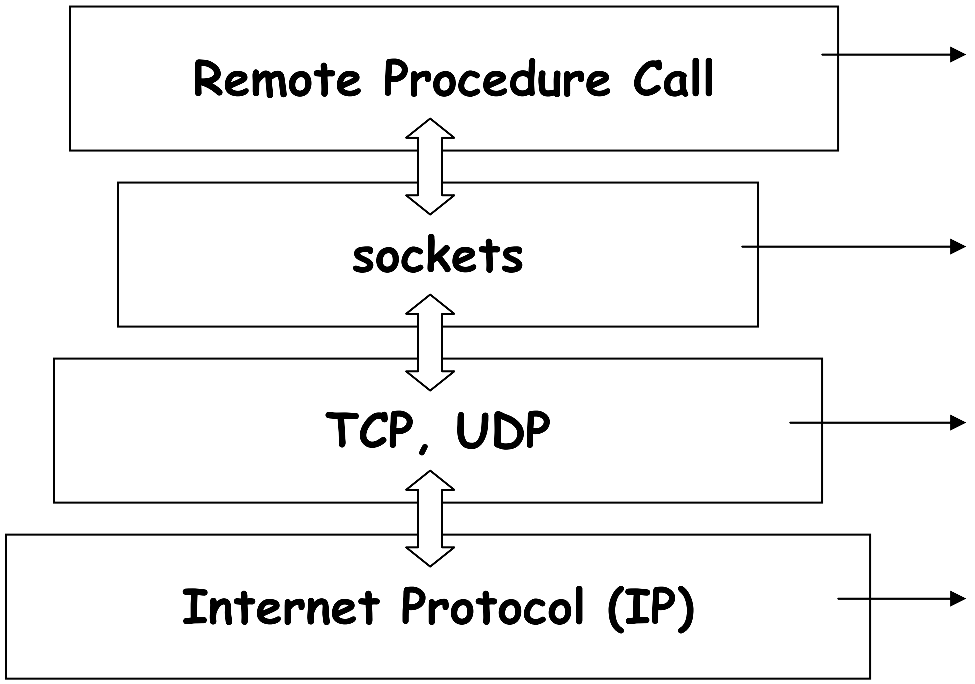
Blocking/Synchronous Communication



Nonblocking/Asynchronous Communication



RPC Abstraction



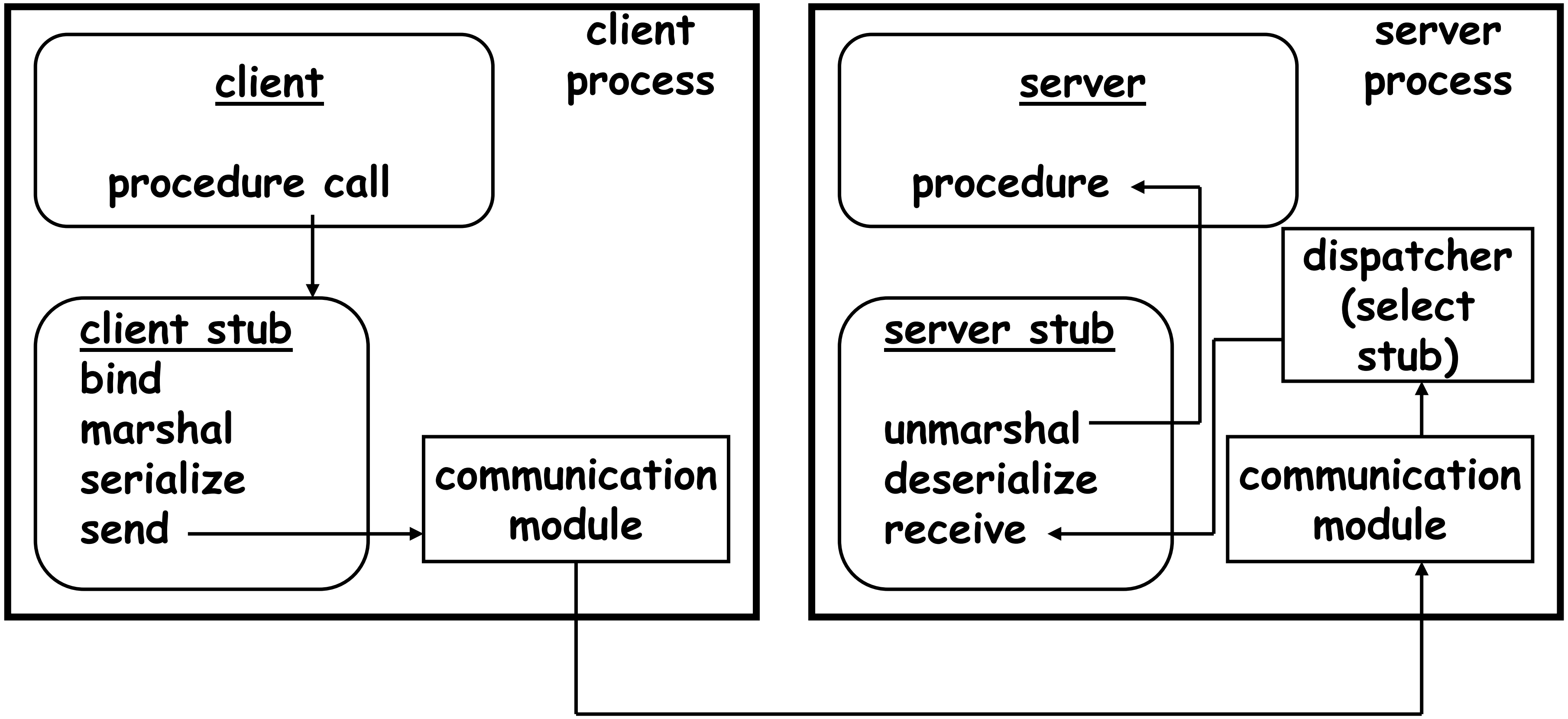
__Remote Procedure Call__:
hides communication details behind a procedure call and helps bridge heterogeneous platforms

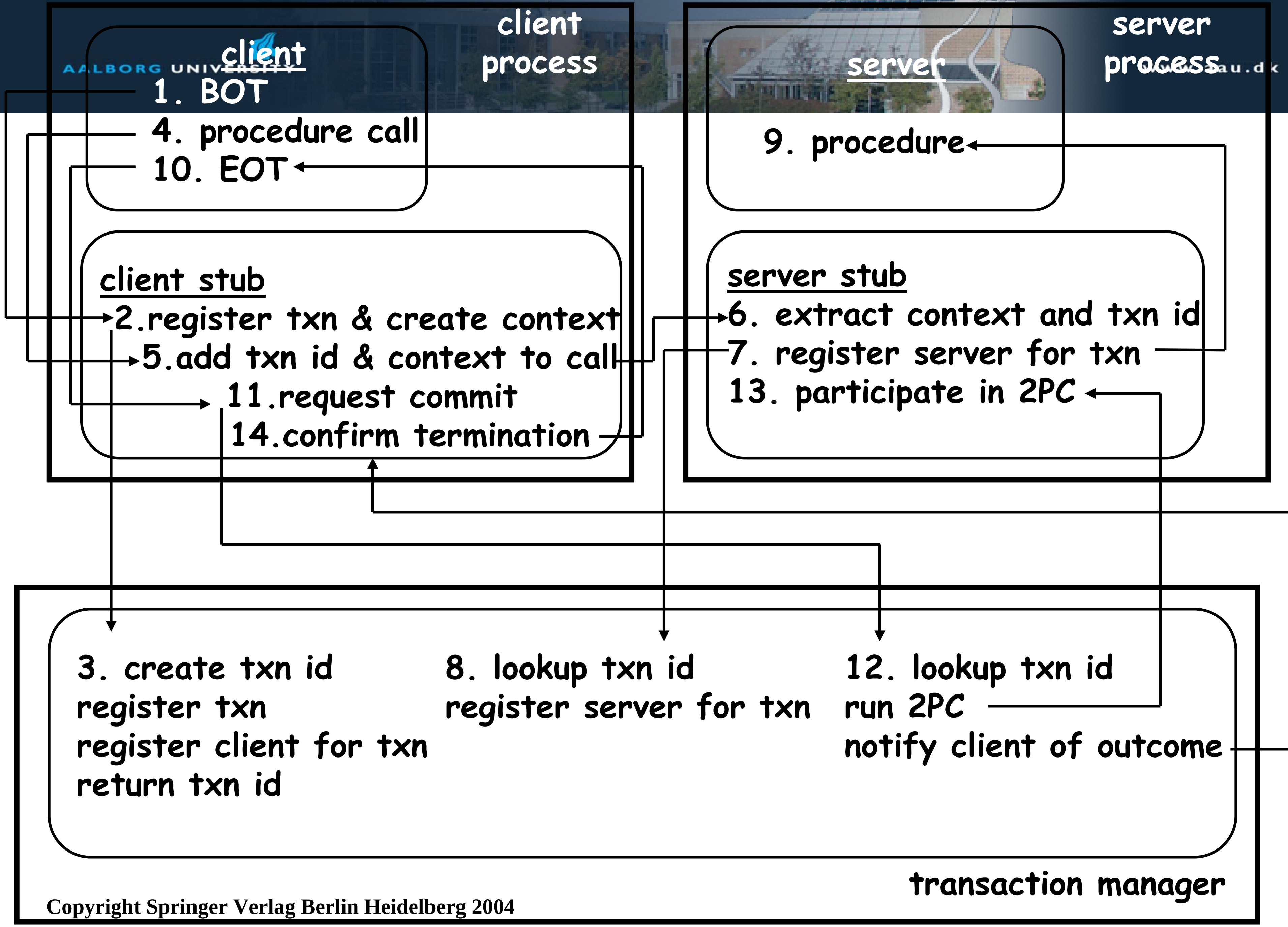
__sockets__:
operating system level interface to the underlying communication protocols

__TCP, UDP__:
User Datagram Protocol (UDP) transports data packets without guarantees
Transmission Control Protocol (TCP) verifies correct delivery of data streams

__Internet Protocol (IP)__:
moves a packet of data from one node to another

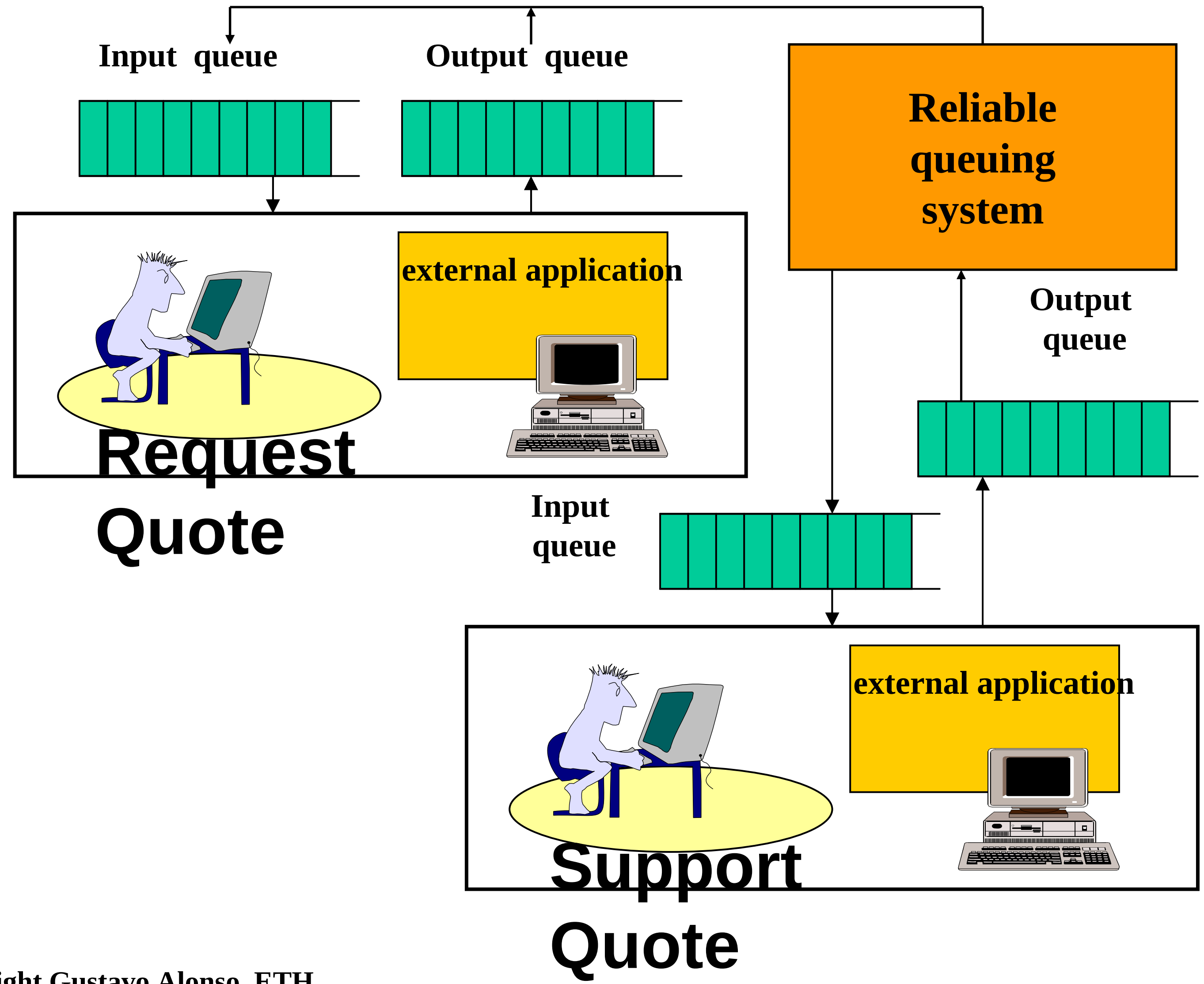
RPC

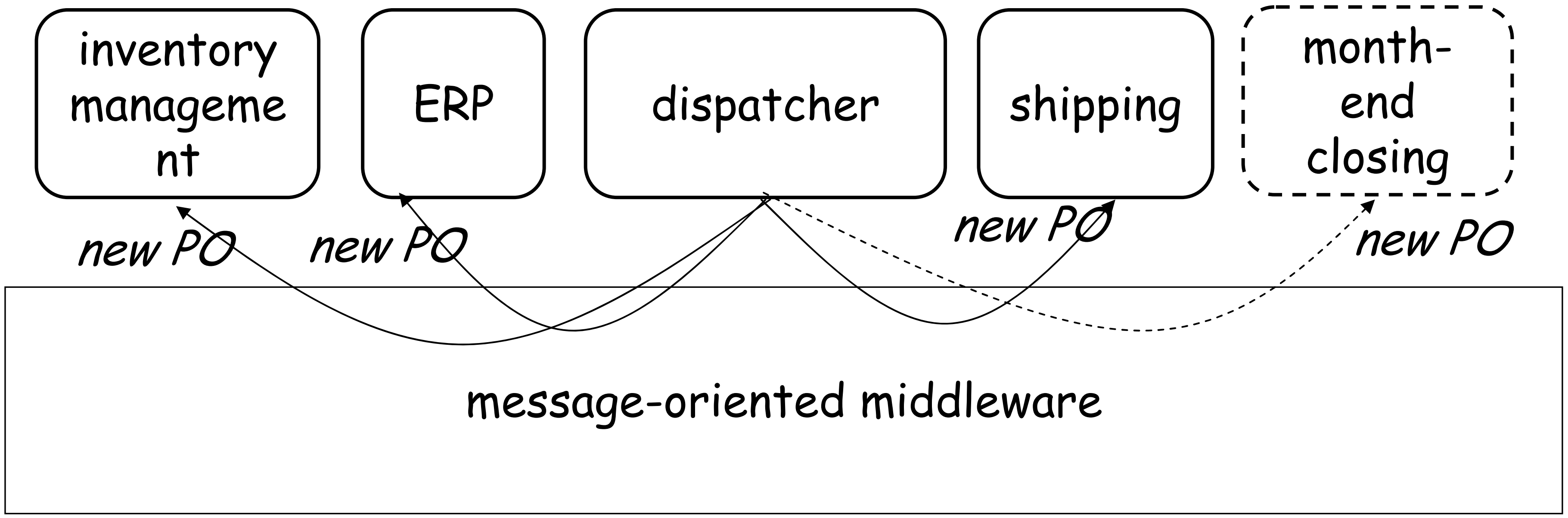

client process
client
procedure call
client stub
bind
marshal
serialize
send
communication module
server process
server
procedure
dispatcher (select stub)
server stub
unmarshal
deserialize
receive
communication module


client process
client
1. BOT
4. procedure call
10. EOT
client stub
2.register txn & create context
5.add txn id & context to call
11.request commit
14.confirm termination
server process
server
9. procedure
server stub
6. extract context and txn id
7. register server for txn
13. participate in 2PC
3. create txn id
register txn
register client for txn
return txn id
8. lookup txn id
register server for txn
12. lookup txn id
run 2PC
notify client of outcome
transaction manager

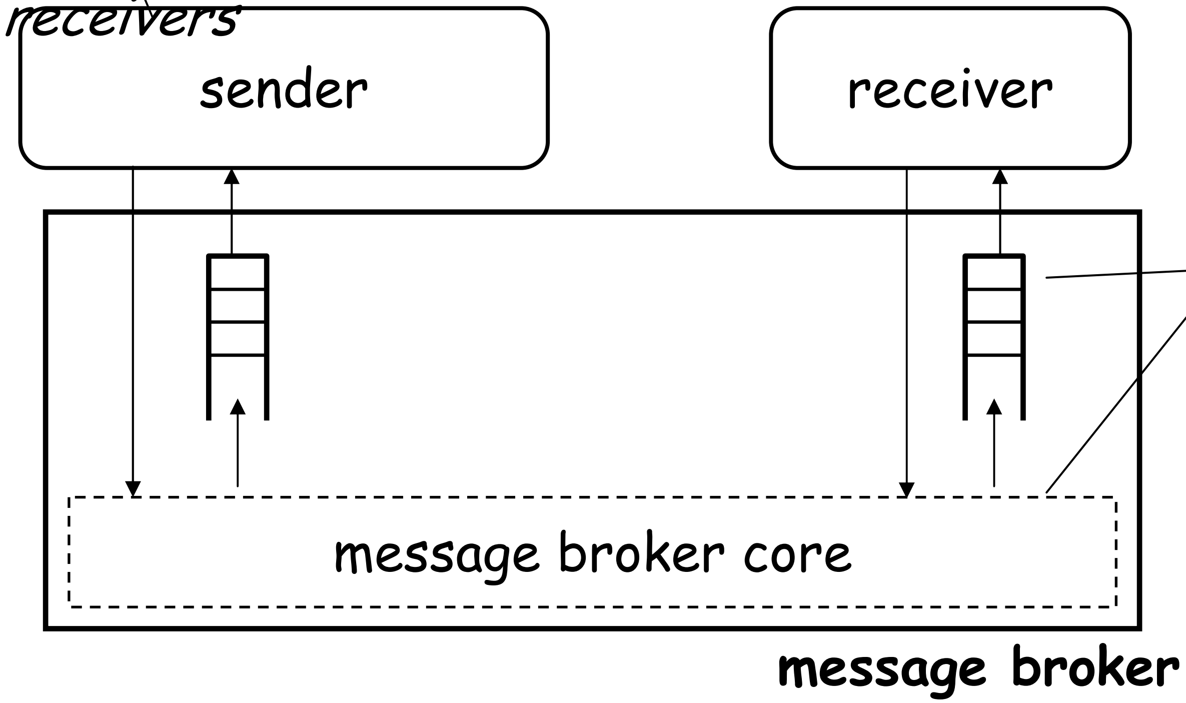
Other Middleware

Object brokers
Object monitors
Message-oriented middleware
Message brokers

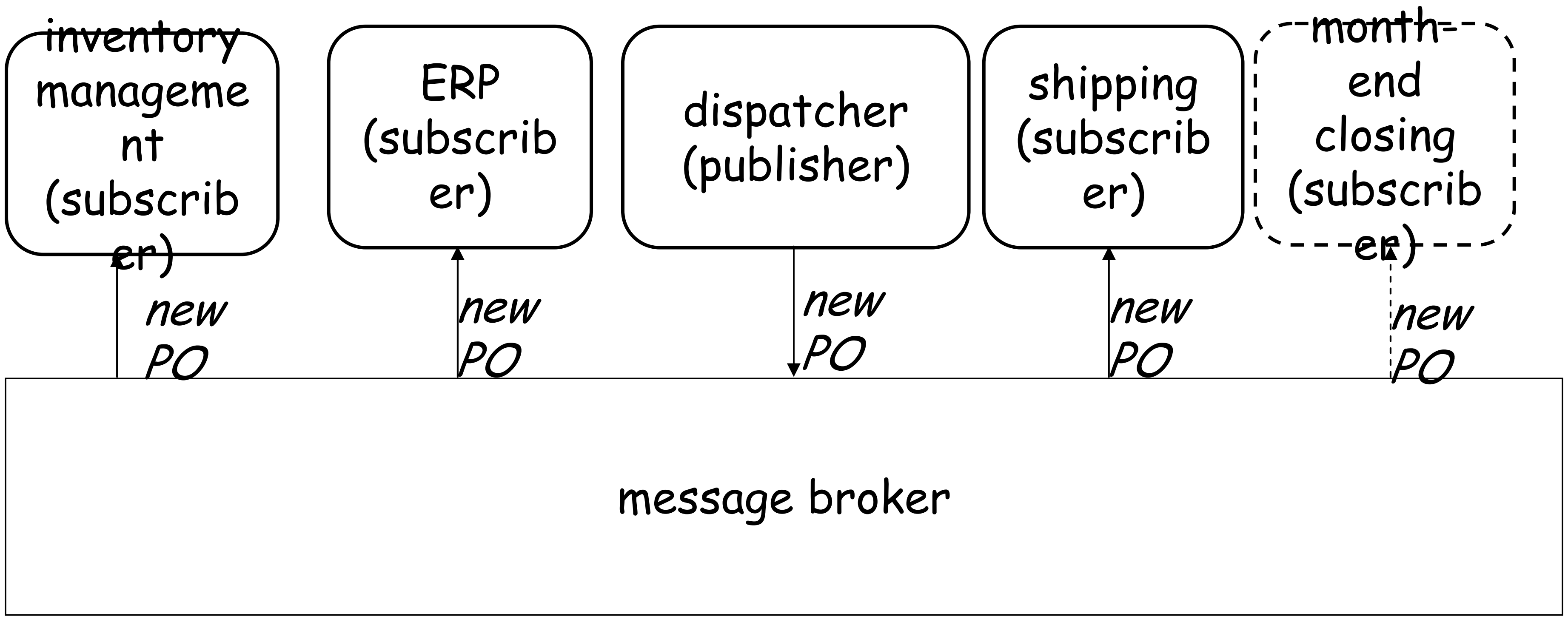

Input queue
Output queue
Reliable queuing system
external application
Request Quote
Output queue
Input queue
external application
Support Quote

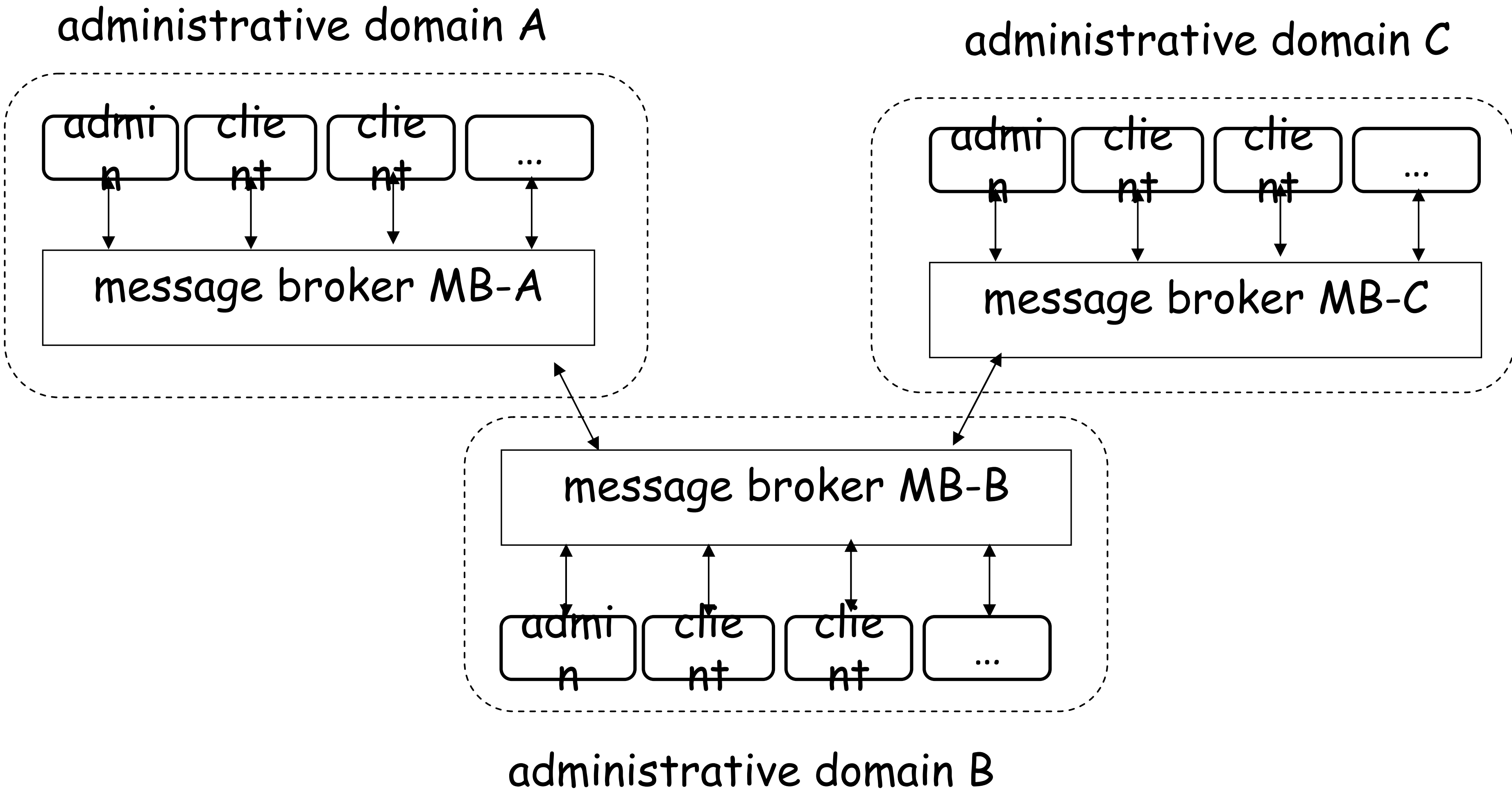

inventory manageme nt
ERP
dispatcher
shipping
month-end closing
new PO
new PO
new PO
new PO
message-oriented middleware

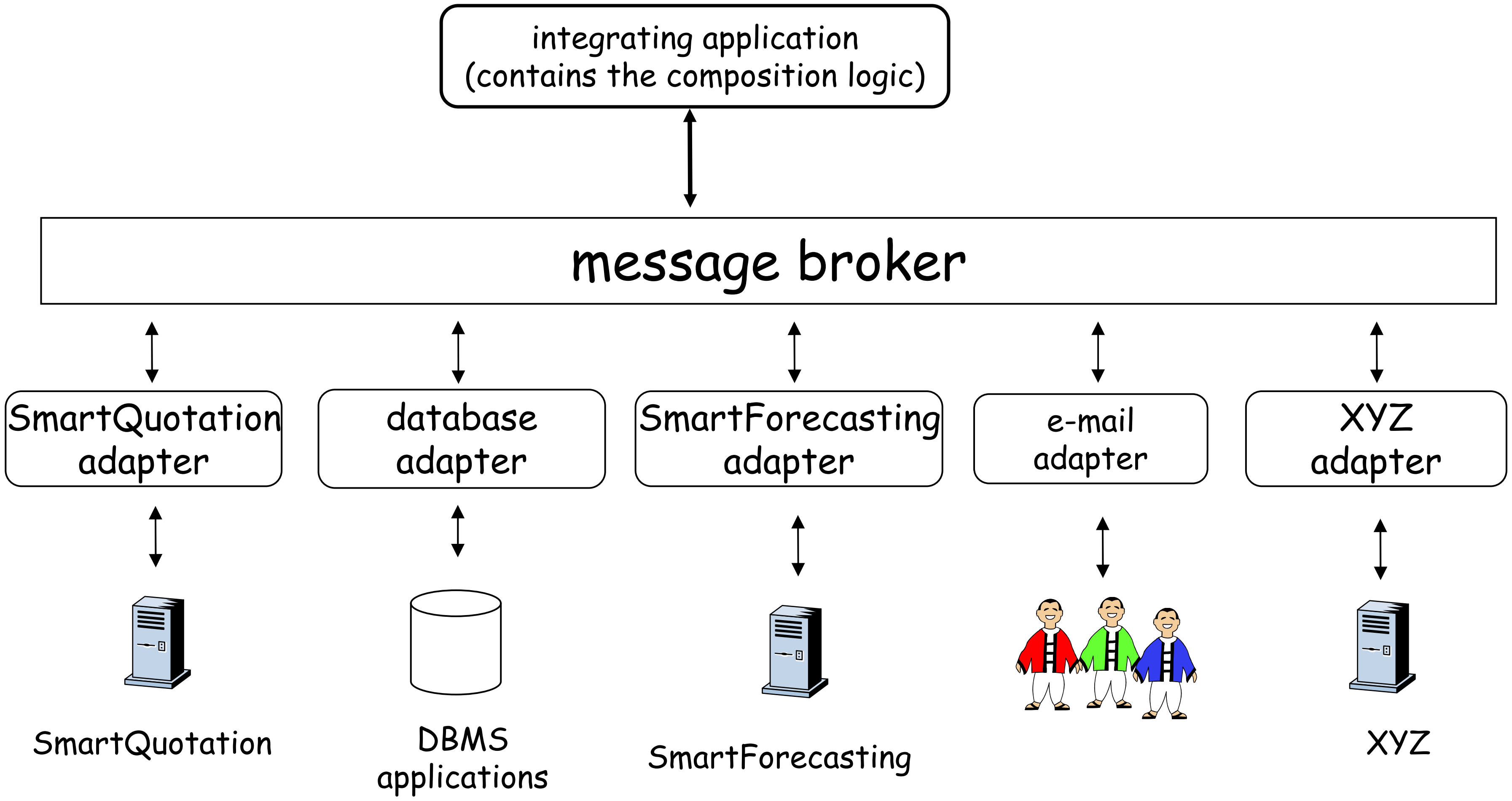
in basic MOM it is the sender who specifies the identity of the receivers

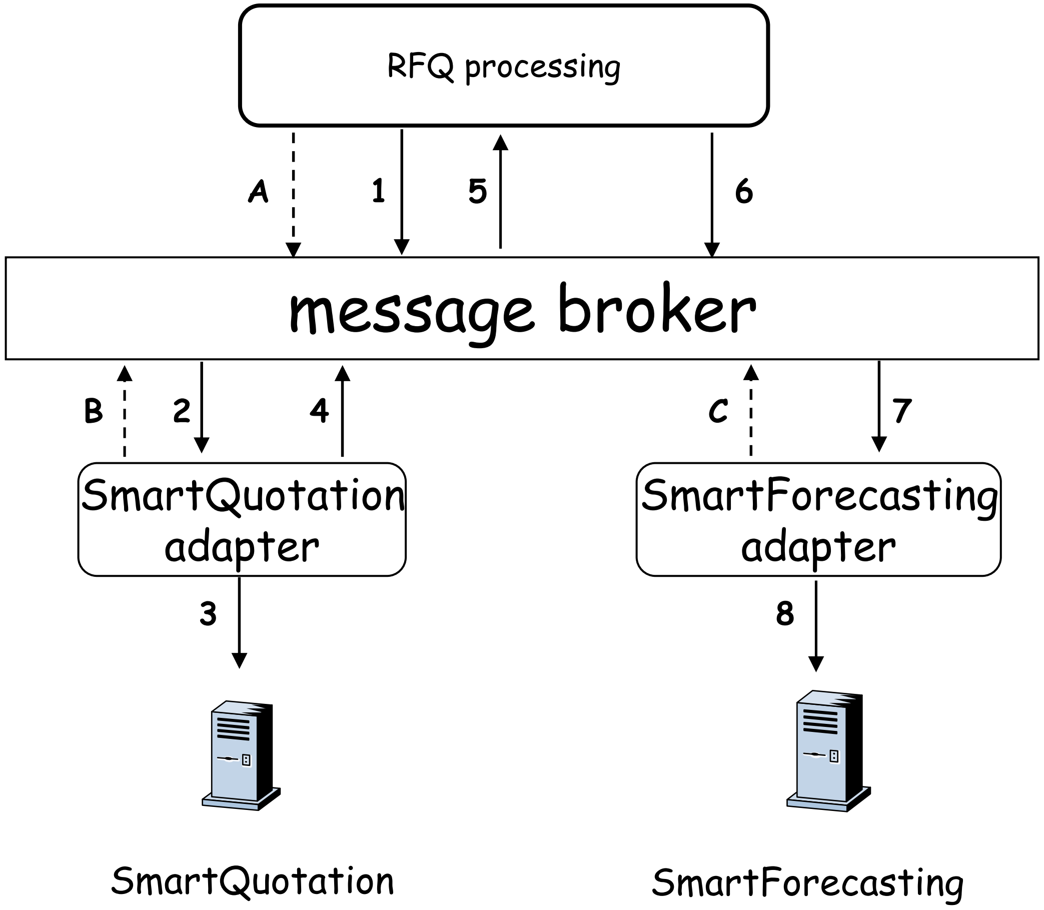


with message brokers, custom message routing logic can be defined at the message broker level or at the queue level


inventory manageme nt (subscrib er)
ERP (subscrib er)
dispatcher (publisher)
shipping (subscrib er)
month-end closing (subscrib er)
new PO
new PO
new PO
new PO
new PO
message broker


administrative domain A
admin
client
client
...
message broker MB-A
administrative domain C
admin
client
client
...
message broker MB-C
message broker MB-B
admin
client
client
...
administrative domain B


integrating application
(contains the composition logic)
message broker
SmartQuotation adapter
database adapter
SmartForecasting adapter
e-mail adapter
XYZ adapter
SmartQuotation
DBMS applications
SmartForecasting
XYZ



at systems startup time (can occur in any order, but all must occur before RFQs are executed)

A: subscription to message *quote*

B: subscription to message *quoteRequest*

C: subscription to message *newQuote*

at run time: processing of a request for quote.

1: publication of a *quoteRequest* message

2: delivery of message *quoteRequest*

3: synchronous invocation of the *getQuote* function

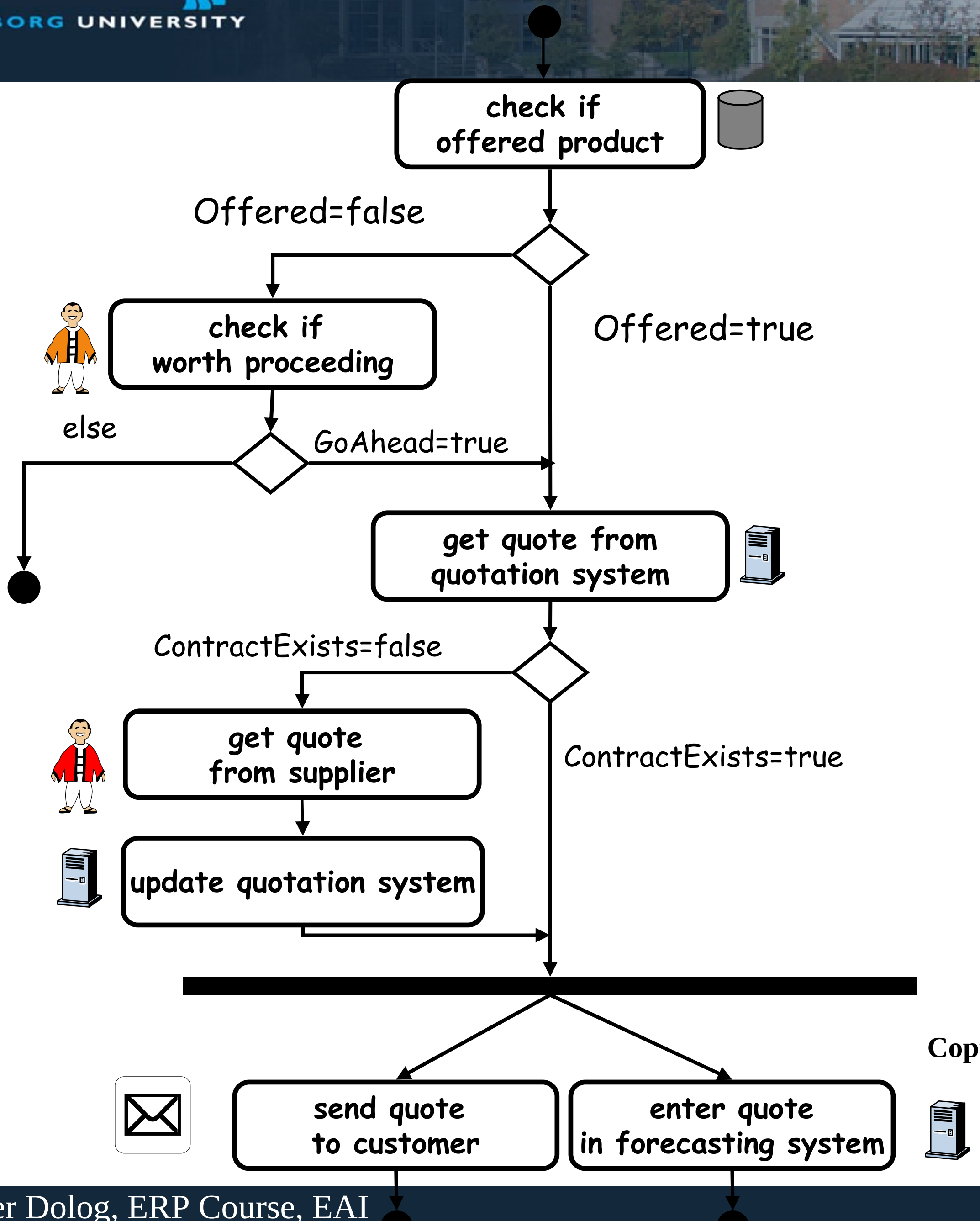
4: publication of a *quote* message

5: delivery of message *quote*

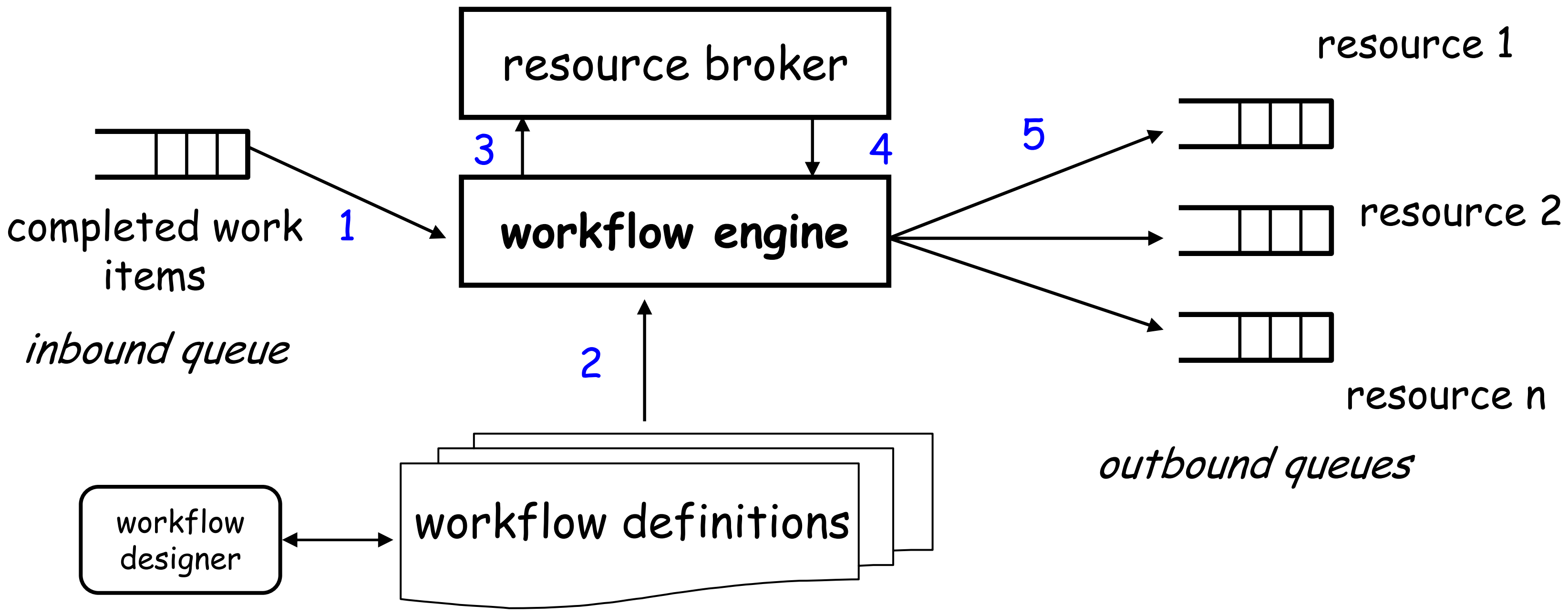
6: publication of a new*Quote* message

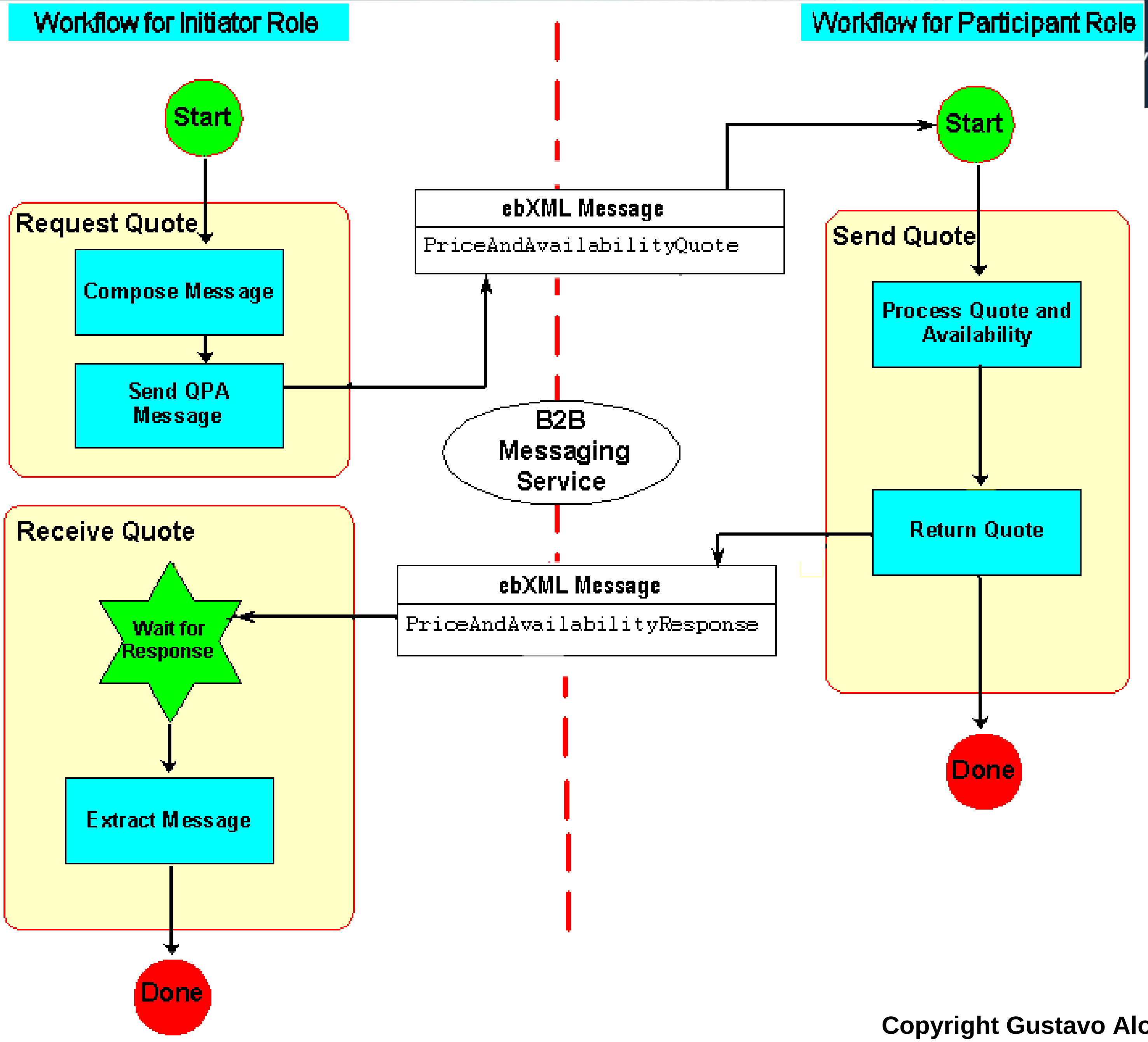
7: delivery of message *newQuote*

8: invocation of the *createForecastEntry* procedure



variables:
QuoteReferenceNumber: int
Customer: String
Item: String
Quantity: int
RequestedDeliveryDate: Date
DeliveryAddress: String
GoAhead: Bool
ContractExists: Bool
Offered: Bool


resource broker
3
4
5
workflow engine
completed work items
1
inbound queue
2
resource 1
resource 2
resource n
outbound queues
workflow designer
workflow definitions



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