

# ENGINEERING ONLINE

# Lecture Notes

**Course Number:** CSC 513

**Instructor:** Dr. Singh

**Lecture Number:** 8



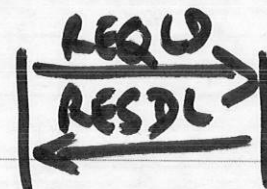
P

P ↔ L :



L

L ↔ D



PREPARE ("SELECT ...")  
OR DATA  
DATA

D

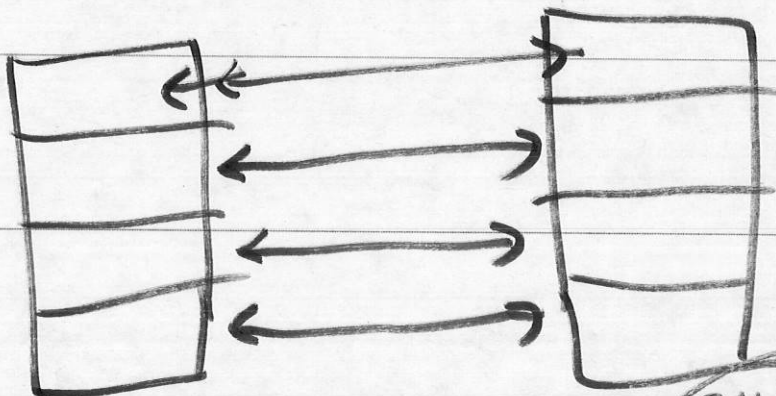
(DESIGN DECISIONS)

NEEDS (THINGS WE NEED TO DO TO EXPRESS A PROTOCOL)

DATA

FORMATTING  
UNDERLYING DATA MODEL

BROADLY INCLUDING PREPARE  
- COMMANDS <sup>SQL</sup>  
- PAYLOAD OF THE COMMANDS  
- ~~REQD~~ DOMAIN DATA (EG STUDENT ID)



NOT TALK ABOUT  
OTHER LAYERS

ENCRYPTION  
SIGNATURE  
AUTHENTICATION

DISREGARD UNLESS WE ARE  
TALKING ABOUT  
THEM



## DESIGN DECISIONS INVOLVING A PROTOCOL

→ DATA :

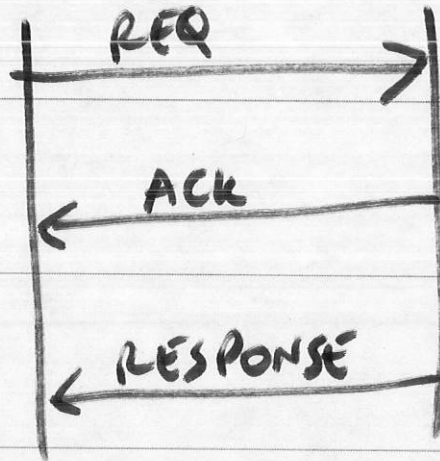
→ CONTROL

CHALLENGES FACED IN DESIGNING THE ABOVE  
ESP THE CONTROL

ACCOUNTING FOR  
DEALING WITH EXCEPTIONS

- DISCONNECTION
  - TIMEOUT
  - DATA ERRORS
- } LOWER LAYER  
EXCEPTIONS



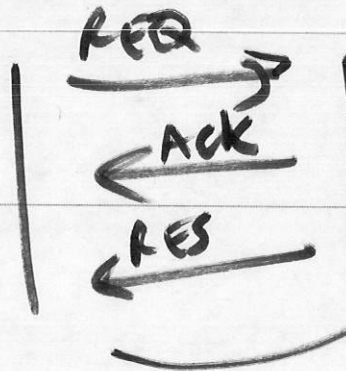


IF THIS IS A  
NETWORK LAYER THEN  
~~HENCE~~ NOT  
VISIBLE AT  
THE APPLICATION  
LAYER

IF  
AT THE APP LAYER TWO PROTOCOLS:



VS



HOW  
DO THESE DIFFER?

CONTROL STRUCTURE

SEEMS NOT  
TO FIT THE  
RPC OR THE  
CLIENT-SERVER  
PARADIGM



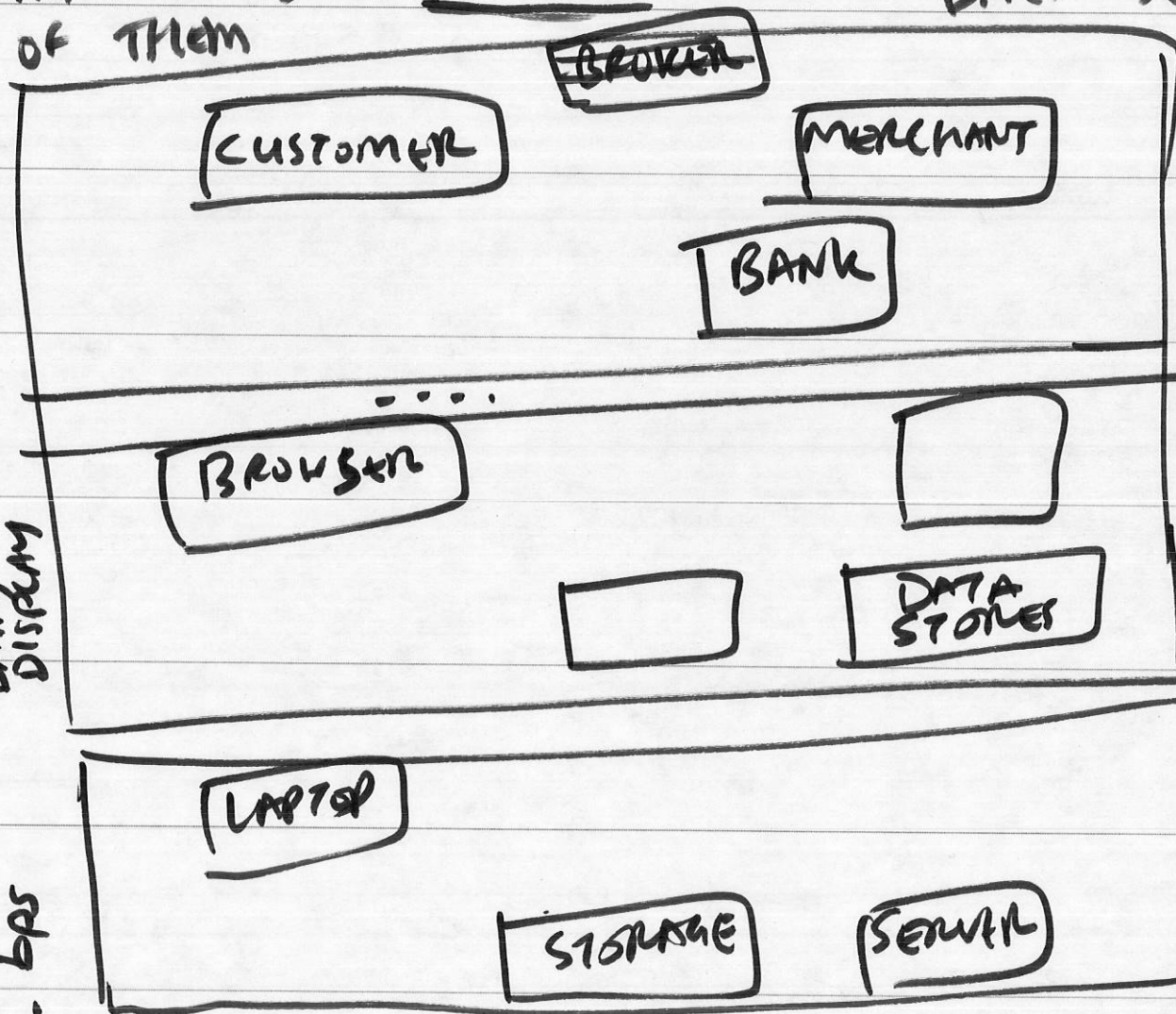


E-COMMERCE B2C

→ PRESUMING AN ARCHITECTURE

THINK OF SOME PROTOCOLS AND SOME BRIEF DESCRIPTIONS OF THEM

SEPARATION OF CONCERNS  
Buy, Sell  
DATA  
DISPLAY  
... bps



BUSINESS

TECHNICAL

IMPLEMENTATION



# A PURCHASE PROTOCOL

## ROLES

CUSTOMER

MERCHANT

INTERNAL

DECIDES TO BUY  
INTERNAL  
DECISION

ORDER ...

MERCHANT  
PROCESSES  
THE ORDER  
(ACCORDING TO  
MERCHANT'S  
POLICIES)

PRIVATE

AUTONOMY  
HETEROGENEITY

PUBLIC  
PROTOCOL  
INTERFACE

PRIVATE  
POLICY  
IMPLEMENTATION

1984 ON KINDLE



SHIPPER

CUST

MER

BANK

ORDER

REQUEST FOR  
APPROVAL

DETAILS

} AUTHENTICATE  
APPROVE

APPROVAL

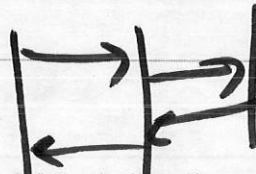
CONFIRMATION

?

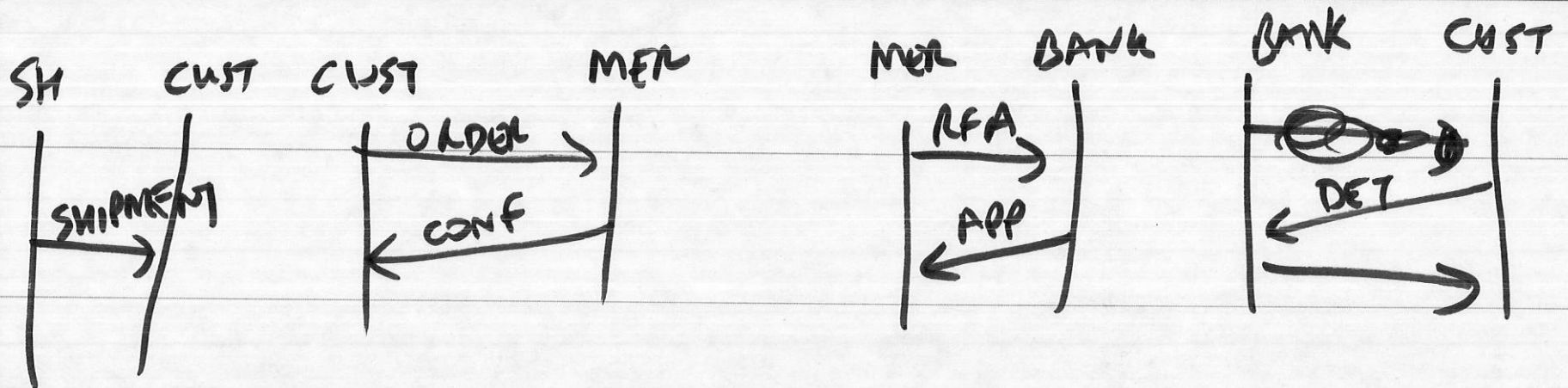
SHIPMENT

IS THIS MODULAR?

→ SMALLER UNITS  
OF INTERACTION  
→ PAIRWISE ?







NO CONSTRAINTS AMONG PROTOCOLS

GOOD: FLEXIBLE  
CONCURRENTLY

BAD: INVALID EXECUTIONS ARE  
POSSIBLE

MODULARITY IS FINE

- BUT WE NEED STRUCTURE TO ENSURE GOOD PROPERTIES

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