• Final: take-home (like prelim)
  • Available: 13 May
  • Due: 20 May firm

• Project presentations:
  • 10:00, 1:00, 3:00 weekdays
    • between 3:00 6 May and 3:00 19 May
  • Signup sheet Kathy, 4115 Upson
Failures

• How detect them?
• Recovery at the client?
Client View of Server Failure

• A synchronous call will timeout and raise an exception immediately

• MOM-managed messages will put messages in a queue and retry delivery to receiving server(s)
  • Multiple delivery failures => error log?
  • Failure to process correctly => compensate (app’s responsibility)
Shipping and Billing Again ...

Billing  Web Site  Shipping

Schedule

Visa Charge  Ready to Ship

Delivered

Forget  Forget

This part could fail back to user

Failures here require compensation and user notification
Async Failure

Failure at Web or Billing sites raises exception at Shipping site

Could not do compensating rollback at this point!

Site needs long-term retry mechanism
Retry

- The fact that a business op is retrying must be persistent (ACID txn required)
- Retries should respect original order if app is at all sensitive to this!
- Failure at this level => unrecoverable error
- Error log for manual recovery
• Even “real” e-Business sites notify customers of exceptions by email
• But eMail is not transactional!
• Oh, well ...
Manual Queue

- Queue is a relational table in DB
- Queue items timestamped
- Daemon process to drain queue
- Daemon uses SQL for dequeue
  - rely on server for txn behavior and dup suppression
- Cannot preserve queue ordering if concurrent calls allowed
Bulk Queue Transfer

- Queue is a relational table in each DB
- Queue propagation uses distributed txns if available to avoid duplication of queue items
  - not critical if dup elimination is done
- Apply process entirely on server side
- Preserve queue ordering in apply?
Async User Request

Web Site  Shipping

What if the messages cross?

Care required to avoid deadlock

Care required for consistent resolution of conflict at both sides