

# CS5/7319- Software Architecture and Design

## Homework #4

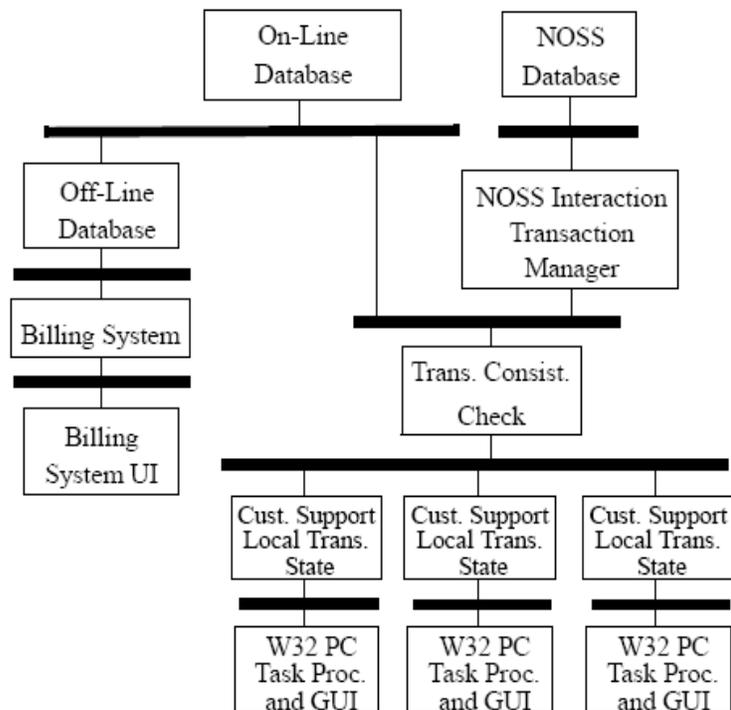
### (10 Points)

*On Campus Due Date: 11:59pm on April 18, 2024*

*Off Campus Due Date: 11:59pm on April 19, 2024*

In this assignment, you are required to provide an architectural description of a subset of the C4 system using the C2SADEL architecture description language (ADL) discussed in the class and in the addendum provided as part of this assignment. The ADL description should reflect the architectural breakdown and topology given in the figure below with the full specification of C4 system topology, component and connector types, as well as their instantiations and interconnections in the depicted configuration. Then you are asked to provide the full specifications of the components: On-Line Database, Off-Line Database and Billing System. The architecture must meet at least the following C4 system requirements:

- 1) Automatic daily updating of the Off-Line Database.
- 2) Support for concurrent tasks.
- 3) Support for long-lasting, interrupted sessions. You may make use of specialized operations and/or fields in the database. Additionally, incorporate a mechanism for generating reminders to assist the customer representatives (e.g., a popup at a time requested by the customer). Involved components will probably be W32 PC Task Processor and GUI, Local Transaction State, and the On-Line Database.



You can assume that the On-Line Database will include the following information:

1. Name
2. Date of birth
3. SSN
4. Address
5. Phone number(s)
6. Voice mail
7. Caller ID
8. Three-way calling
9. Numbers called or services accessed (e.g. Directory service)
10. Long distance provider
11. Numbers called and duration during the past three months

The On-Line Database can get user data, add/delete/update user, add/remove service, and add/remove calls.

The Off-Line Database will include the following information:

1. Phone number
2. Numbers called and duration during the past three months
3. Rates
4. Amounts charged per phone call

The Billing System can display the customer bill by the phone number. Bills are generated from the off-line records. Note that C4 does not interact with the Billing System, but it works against the same set of DBs. More specifically, C4 interacts with the on-line part of the corporate DBs, while the Billing Systems work with the batch copy of the on-line DBs. Monthly billing is done in a number of cycles. Each cycle processes billing information of a set of customers. All updates to the data of the current cycle are halted (applied only to the on-line data) until the end of the cycle. The updates (at the end of the cycle) are done in batch and are transparent C4.

Assume the message filtering mechanism of all connectors in this assignment is no-filtering.