Material Transport System

IH JEONG / KOREA
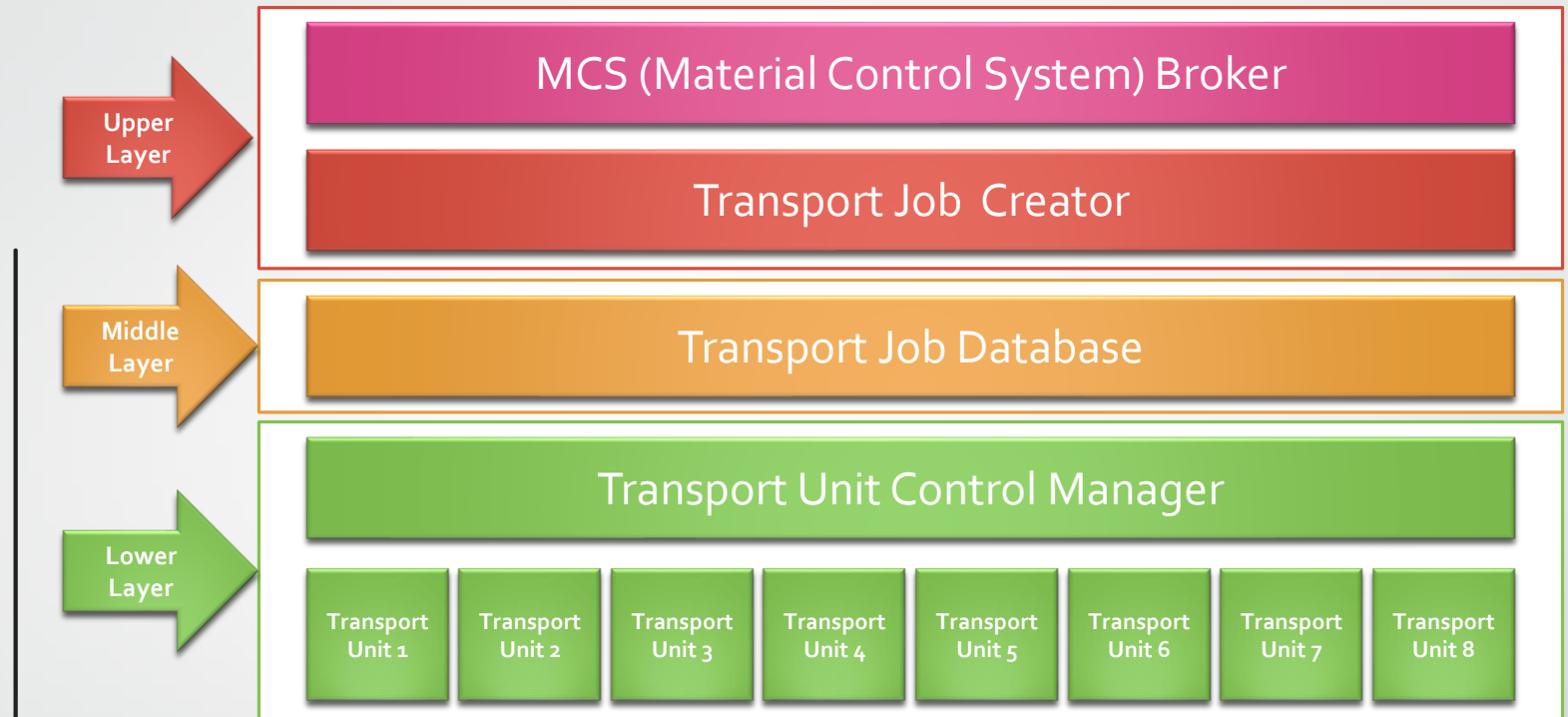
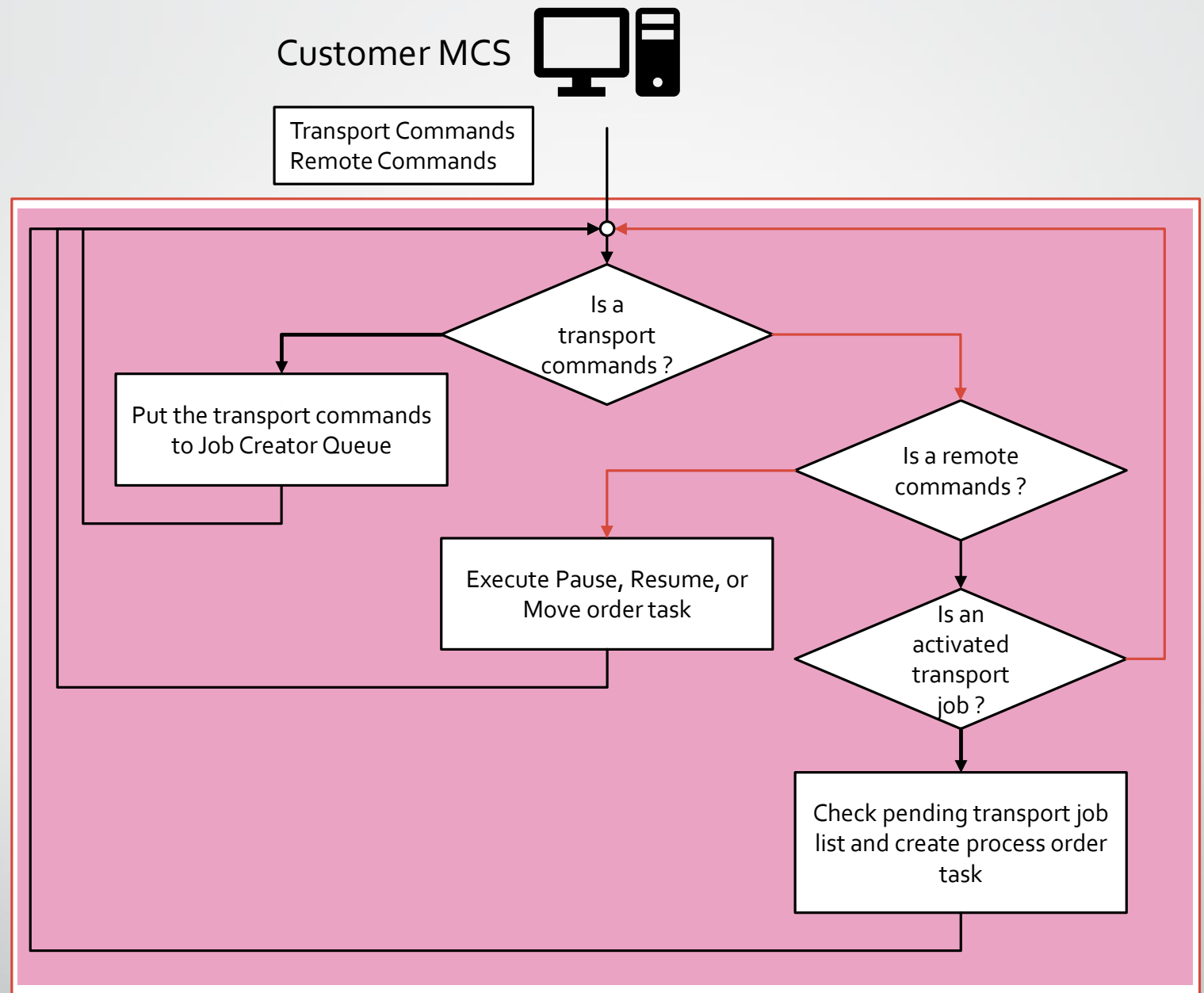Provide Scalable Management Solution

Revision 1.0.0.0

Agendas

- Structure of MTS
- Structure of MCS (Material Control System) Broker
- Structure of Transport Job Creator
- Structure of Transport Job Database
- Structure of Transport Unit Control Manager
- Goals of MTS
- Applied design concepts

Structure of MTS

| Upper Layer | MCS (Material Control System) Broker |
| | Transport Job Creator |

| Middle Layer | Transport Job Database |

| Lower Layer | Transport Unit Control Manager |

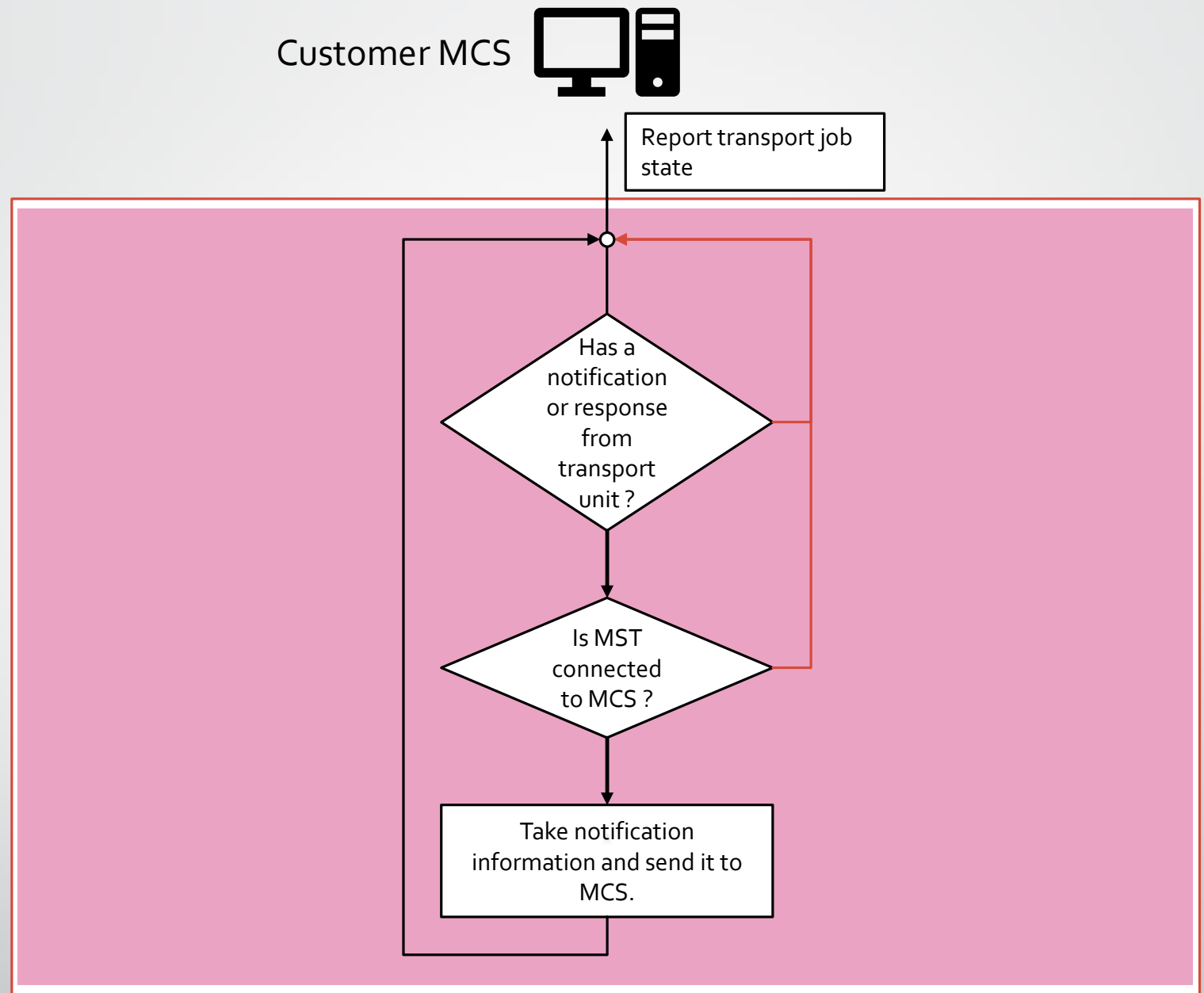| Transport Unit 1 | Transport Unit 2 | Transport Unit 3 | Transport Unit 4 | Transport Unit 5 | Transport Unit 6 | Transport Unit 7 | Transport Unit 8 |

- MTS (Material Transport System) 은 역할에 따라서 3 개의 층으로 나눈다.
- 상위 (MCS Broker Layer)
  고객사 MCS (Material Control System) Broker 와 Transport Job Creator 로 구성된다.
- 중간 (Transport Job Database Layer)
  Transport Job 을 유지하고, 상태를 관리한다.
- 하위 (Transport Unit Control Manager Layer)
  Transport Job 을 수행하는 Unit (최대 8대 반송 로봇) 들의 Transport Job 을 제 및 관리한다.
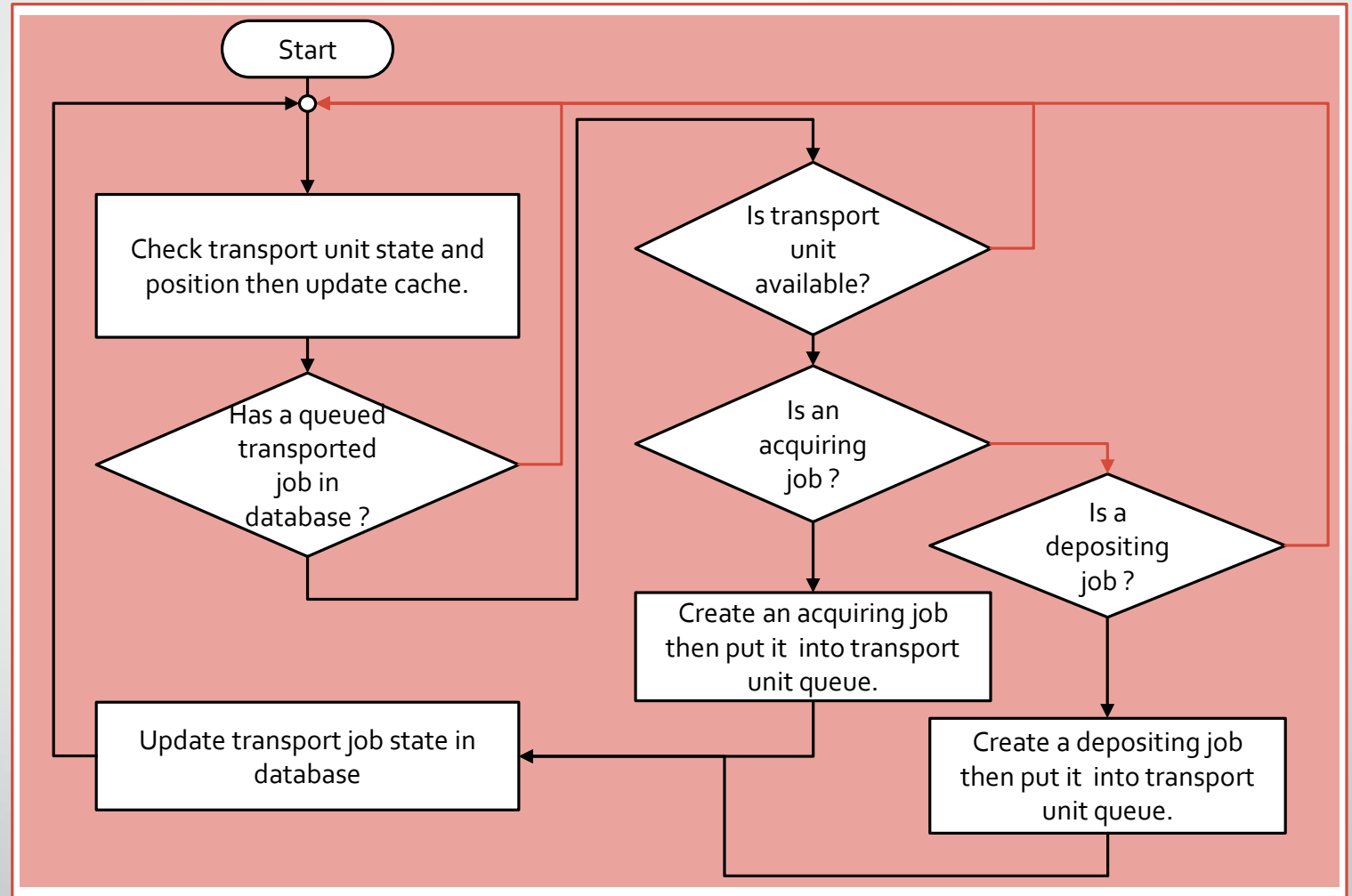
Structure of MCS Broker

Customer MCS

Transport Commands
Remote Commands

Is a transport commands ?

Put the transport commands to Job Creator Queue

Execute Pause, Resume, or Move order task

Is a remote commands ?

Is an activated transport job ?

Check pending transport job list and create process order task

- MCS Broker 의 Remote Commands 별 Task 호출

Structure of MCS Broker (Contd.)

Customer MCS

Report transport job state

Has a notification or response from transport unit ?

Is MST connected to MCS ?

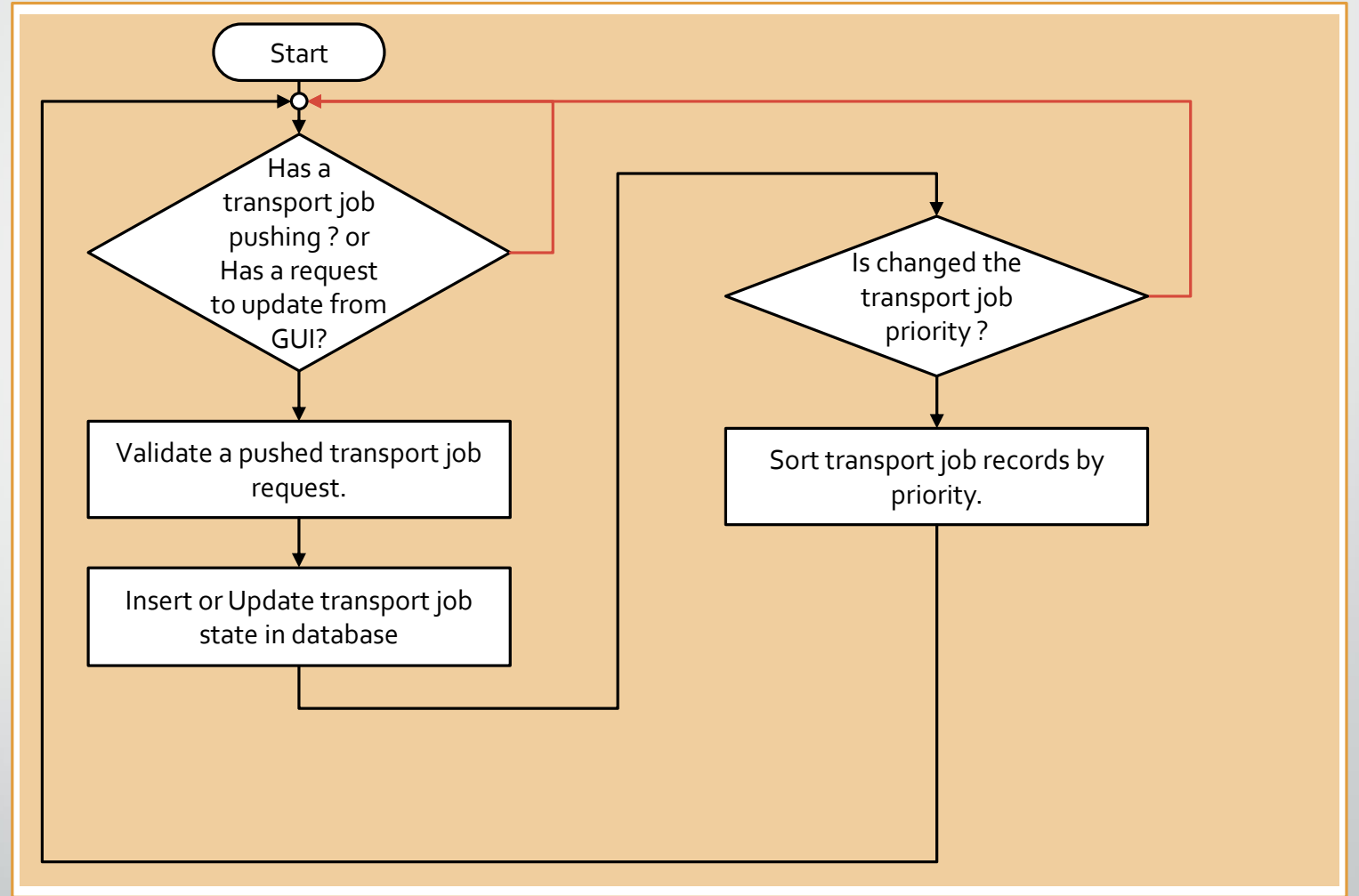Take notification information and send it to MCS.

- Transport unit 의 응답과 이벤트를 MCS 로 전송.
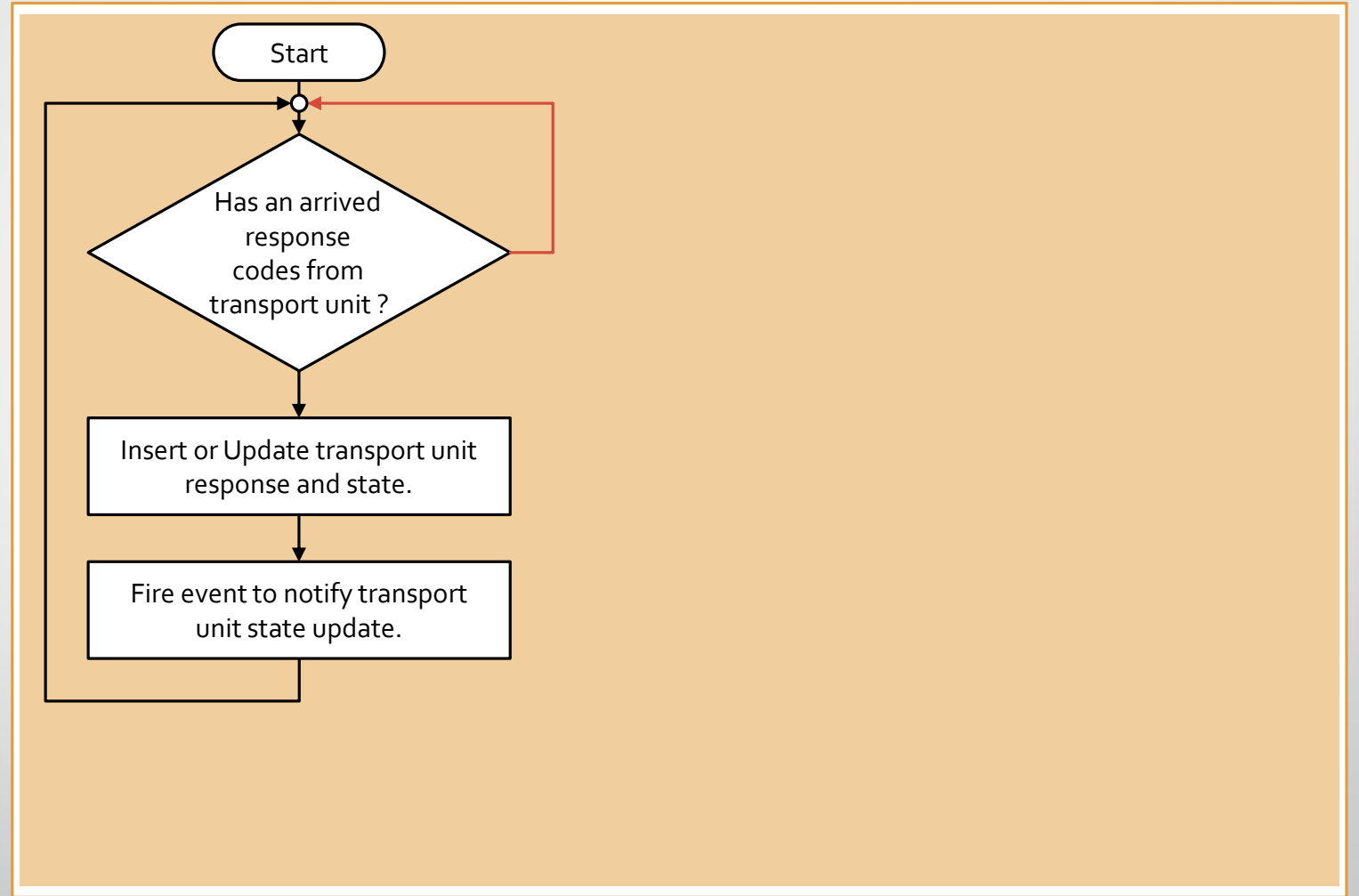
Structure of Transport Job Creator

- Transport Job Creator 는 Transport Unit 상태와 Transport Job pending 여부에 따라서, RUN 상태일 경우 항시 Transport Job 을 생성 배정한다.
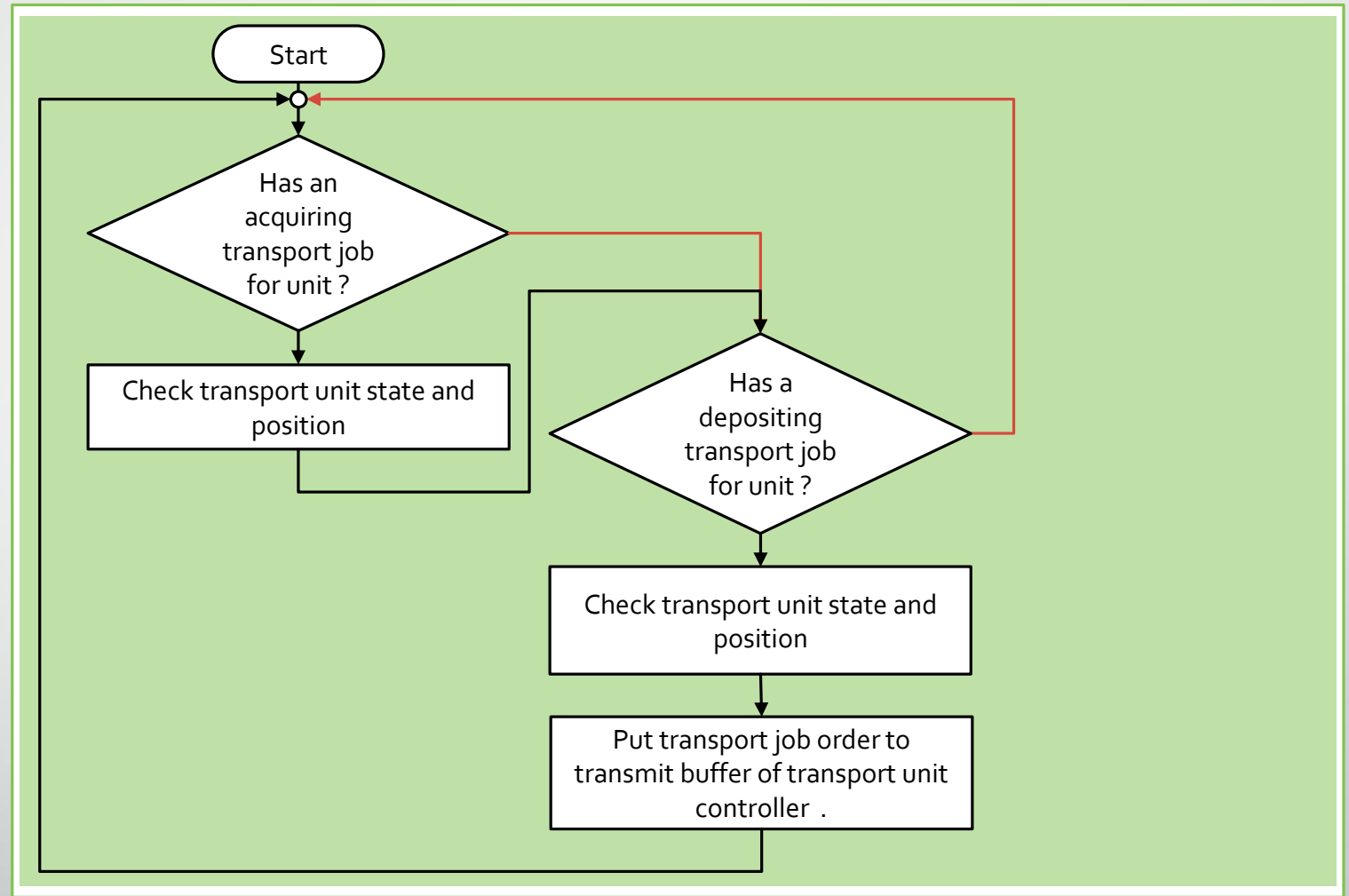
Structure of Transport Job Database

- Transport Job Database 는 transport job pushing 이 있을 경우, transport job 을 등록하며, 관리자의 transport job 우선 순위 변경에 pending 순서를 변경한다.

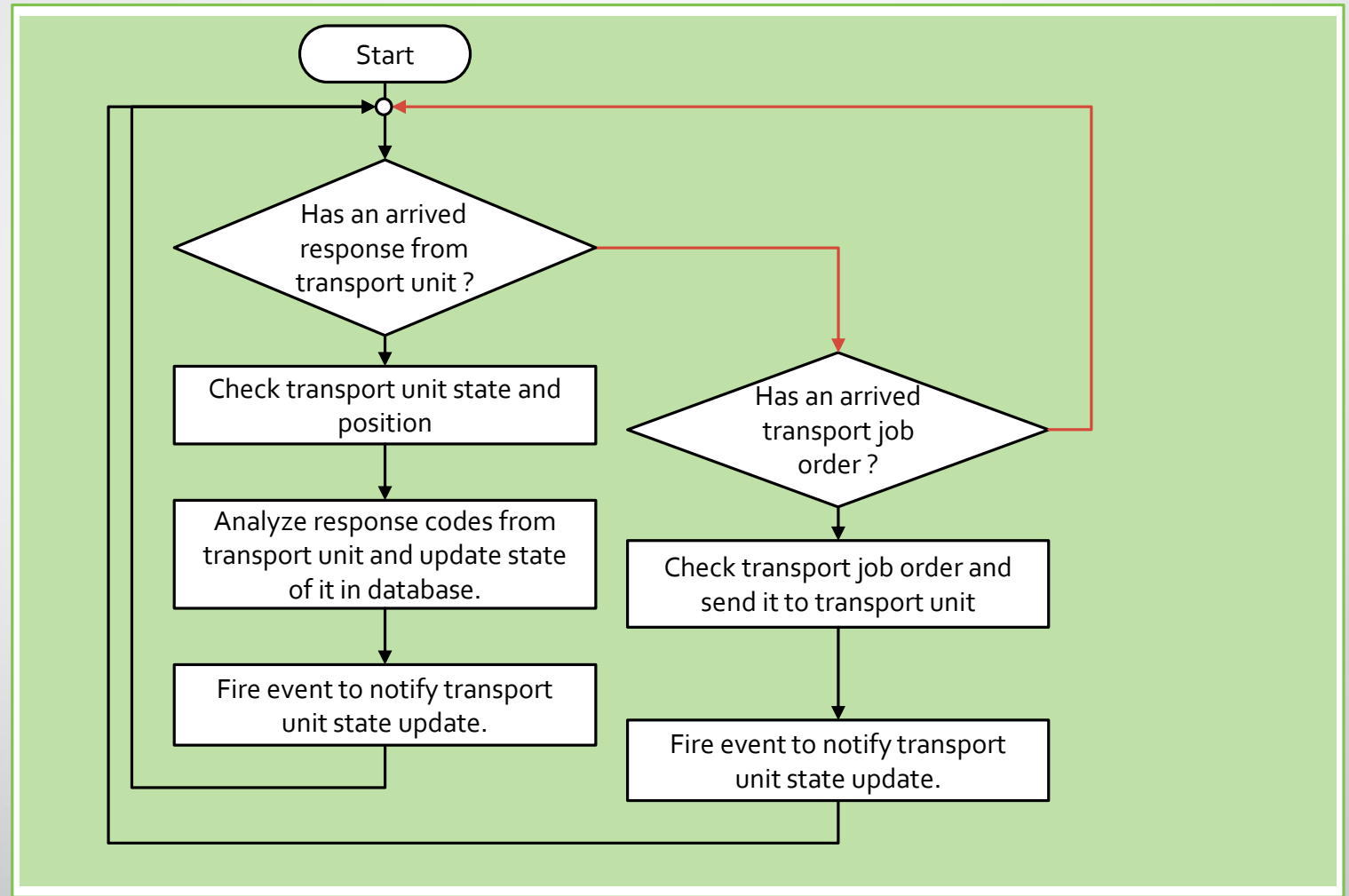# Structure of Transport Job Database (Contd.)

- Transport Job Database 는 transport unit state 가 변경되면, 이를 update 하고, MCS Broker 에게 이를 통지한다.

Structure of Transport Unit Control Manager

- Transport Unit Control Manager 는 Transport Job Creator 에 의해 생성된 transport job 을 transport unit controller 에게 전달하고, transport unit controller thread 에 반송 명령을 전달한다.

Structure of Transport Unit Control Manager (Contd.)

- Transport Unit Controller 의 응답은 transport job database 에 각 transport unit state 테이블에 update 된다.

Goals of MTS

- Provides distributed process task by process modules.

- Provides stable server modules.

- Provides runtime monitoring and service restart features.

- Provides extendable transport unit control manager to manage 8 vehicles. (One license supports to control 8 vehicles.)

- Provides database server divide from MTS to support heavy transaction.

- Provides external schema synchronizing.

- Provides transport job Creator and customizing of job creation by option.

- Provides MCS Broker interface and customizing.

Notice: The 1st phase goals are Marked items by red color.

Applied Design Concepts

- This project contained general mediator device concept. The detail system structure and implementation plan notes will be added with below technical information.
  - MSMQ (Microsoft Message Queue)
  - MSSQL Server (Microsoft Database Server Express)
  - SECS/GEM specification for AMHS-AGV (Samsung V1.8)