CFG Generator

Structured Analysis

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Environmental Model

- Statement of Purpose
- Software Requirement Specification
- System Context Diagram
- Event List

Statement of Purpose

Control Flow Graph Generator

Testing has two approaches. One is structural testing and the other is functional testing. In functional testing, experts conduct testing against project specifications. And in structural testing, experts conduct testing against structure of project. Structure of project is defined some models. In this project we use CFG (Control Flow Graph) which is one of model used in structure testing. When our program receives a c source code, the program converts the source code to CFG

Software Requirement Specification

1.External interface requirement
- 1.1 Report with a text (*.txt) file.
- 1.2 The report show all states and edges of CFG

2. Functional Requirement
- 2.1 Execution
  - 2.1.1 The program uses CUI
    - e.g.) ./CG Inputcode.c result.txt
  - 2.1.2 when a user inputted unpermitted command, the program shows 'help' (that includes command syntax.)
- 2.2 Report generating process
  - 2.2.1 Report shows execution order of c source code.
  - 2.2.2 when c source code inputted successfully, program shows "success" message. Or in error case, the program shows "error" and terminates the program
  - 2.2.3 Before the program converting CFG, shows "converting" message.

Software Requirement Specification

2.2.3 Before the program converting CFG, shows "converting" message.

2.2.4 After report generating process, the program shows the name of report file.

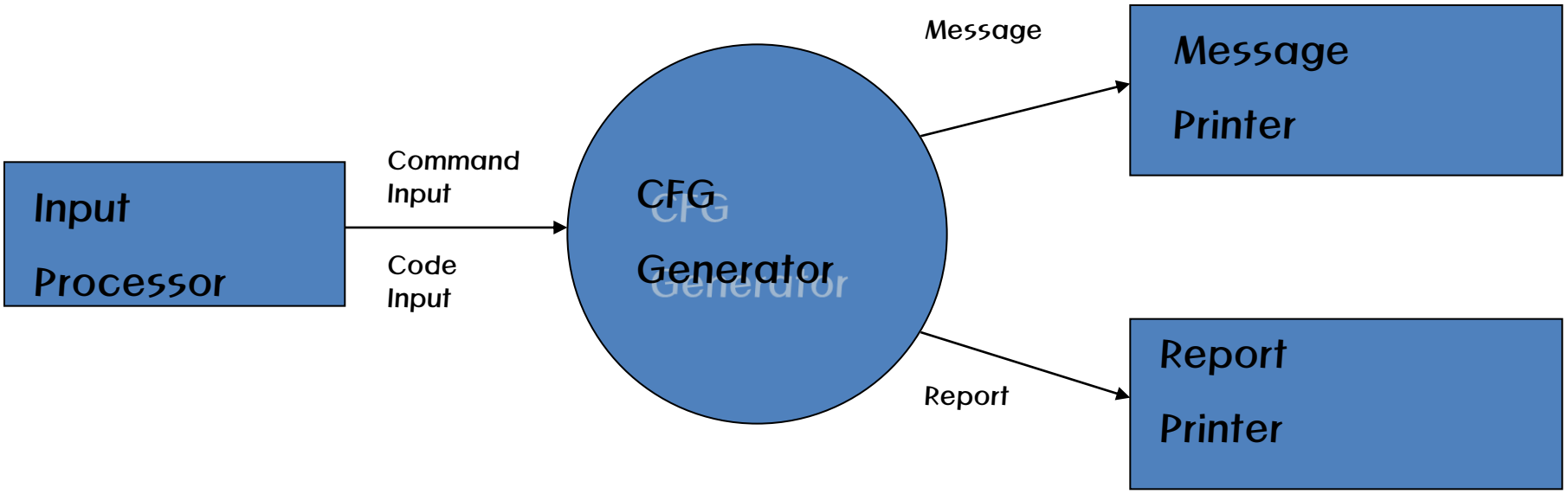
3. Performance Requirement

3.1 C source code has 100~200 lines. It includes main function.

3.2 The C source code doesn't have use defined header files.

3.3 The C source code doesn't include pointers.

System Context Diagram

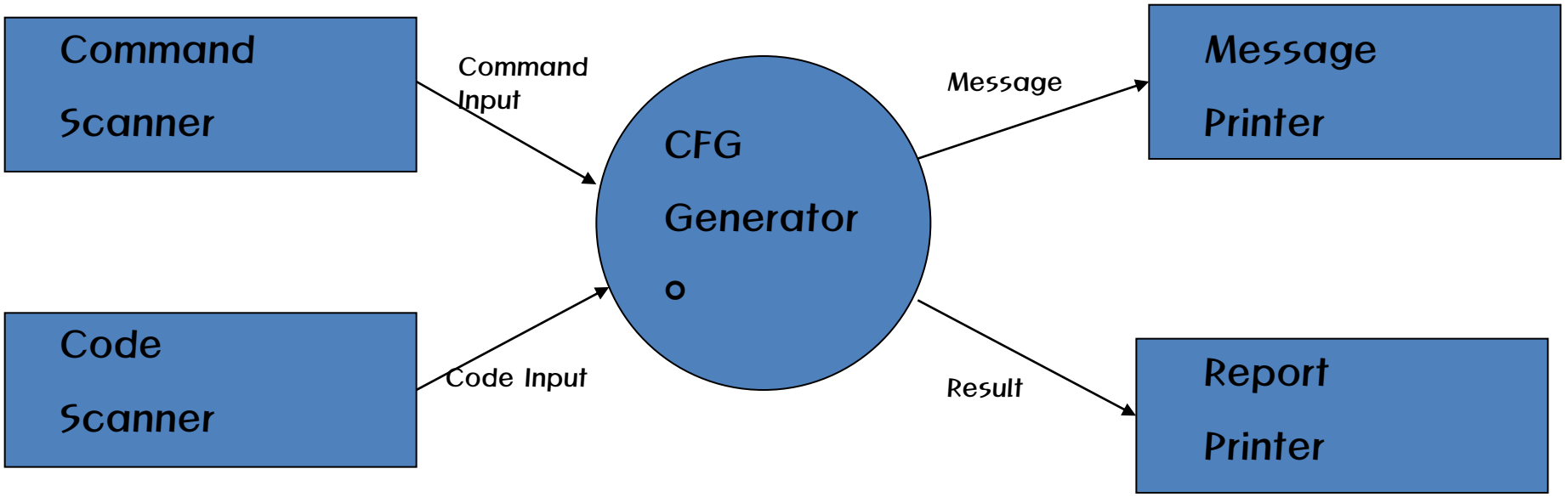


Input / Output Event	Description
Command Input	Receive the Command input from Input Processor.
Code Input	Receive the Code input from Input Processor.
Message	System message that should display on the Monitor.
Report	Informations that are converted into CFG.

Behavioral Model

- DFD
- Data Dictionary
- Process Specification

DFD level 0 – CFG Generator



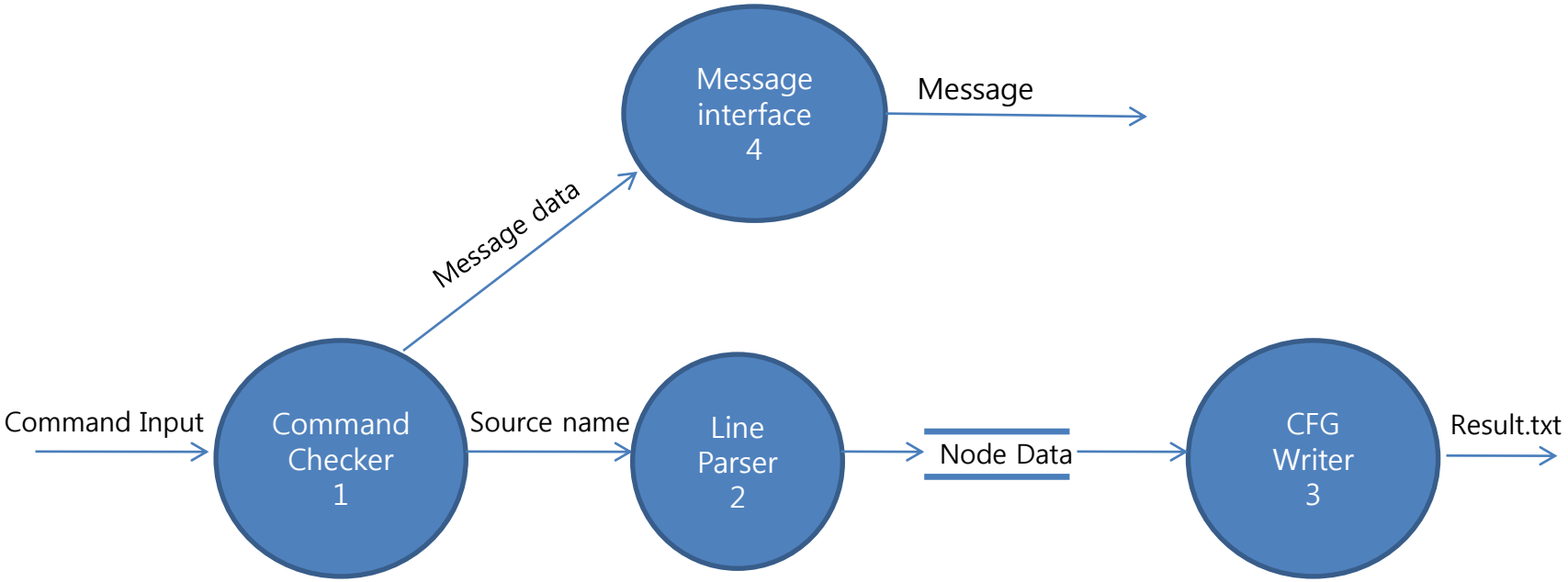
Data Dictionary – DFD level 0

Input / Output Event	Description	format
Command Input	Receive the Command input from Command Scanner.	String
Code Input	Receive the Code input from Code Scanner.	C file
Message	System message that should display on the Monitor.	String
Result	Informations that are converted into CFG.	Txt.file

Process Specification– DFD level 0

Reference NO.	0
Name	CFG Generator
Input	Command Input, Code Input
Output	Message, Report
Process Description	Receive the Command Input and Code Input and then, check or convert them into message and report output.

DFD level 1 – CFG Generator



Data Dictionary – DFD level 1

Input / Output Event	Description	Format
Line Data	String Data parsed from C code line in Source file	String

Process Specification– DFD level 1

Reference NO.	1
Name	Command Checker
Input	Command Input
Output	Message Data, Source name
Process Description	Receive Command Input. And analys the vaild of command input. After that, send a Message data to message interface and source name to line parser.

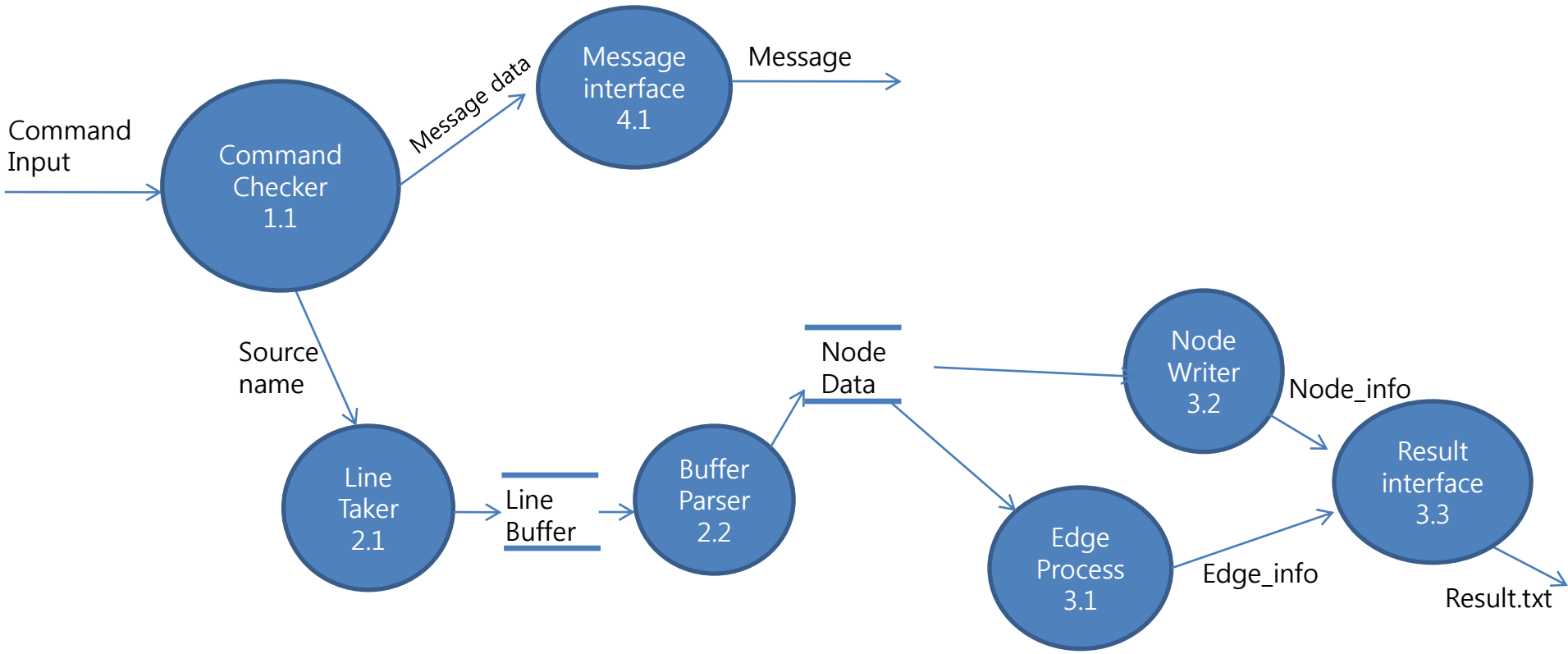
Reference NO.	2
Name	Line parser
Input	Source name
Output	Node data
Process Description	Get line by line in C source, parse data need to make CFG

Process Specification– DFD level 1

Reference NO.	3
Name	CFG writer
Input	Node data
Output	Result.txt
Process Description	Receive Node Data, draw CFG corresponding each case

Reference NO.	4
Name	Message interface
Input	Message Data
Output	Message
Process Description	Convert Message data into Message that can be send to Message printer.

DFD level 2 – CFG Generator



Data Dictionary – DFD level 2

Input / Output Event	Description	format
Command Input	String that inputed by Commander.	String
Source Name	Name that should be converted into CFG.	String
Message Data/Message	System message that should display on the Monitor.	String
Report	Informations that are converted into CFG.	Txt.file
Node Info	Include the node info for CFG	Struct Array
Edge Info	Include the node info for CFG	String Array
Result.txt	Informations that are converted into CFG.	Txt file

Process Specification– DFD level 2

Reference NO.	2.1
Name	Line Taker
Input	Source Name
Output	Line Data
Process Description	Get line by line in C source

Reference NO.	2.2
Name	Buffer Parser
Input	Line Buffer
Output	Line Data
Process Description	Get buffer data and parse data need to make CFG

Process Specification– DFD level 2

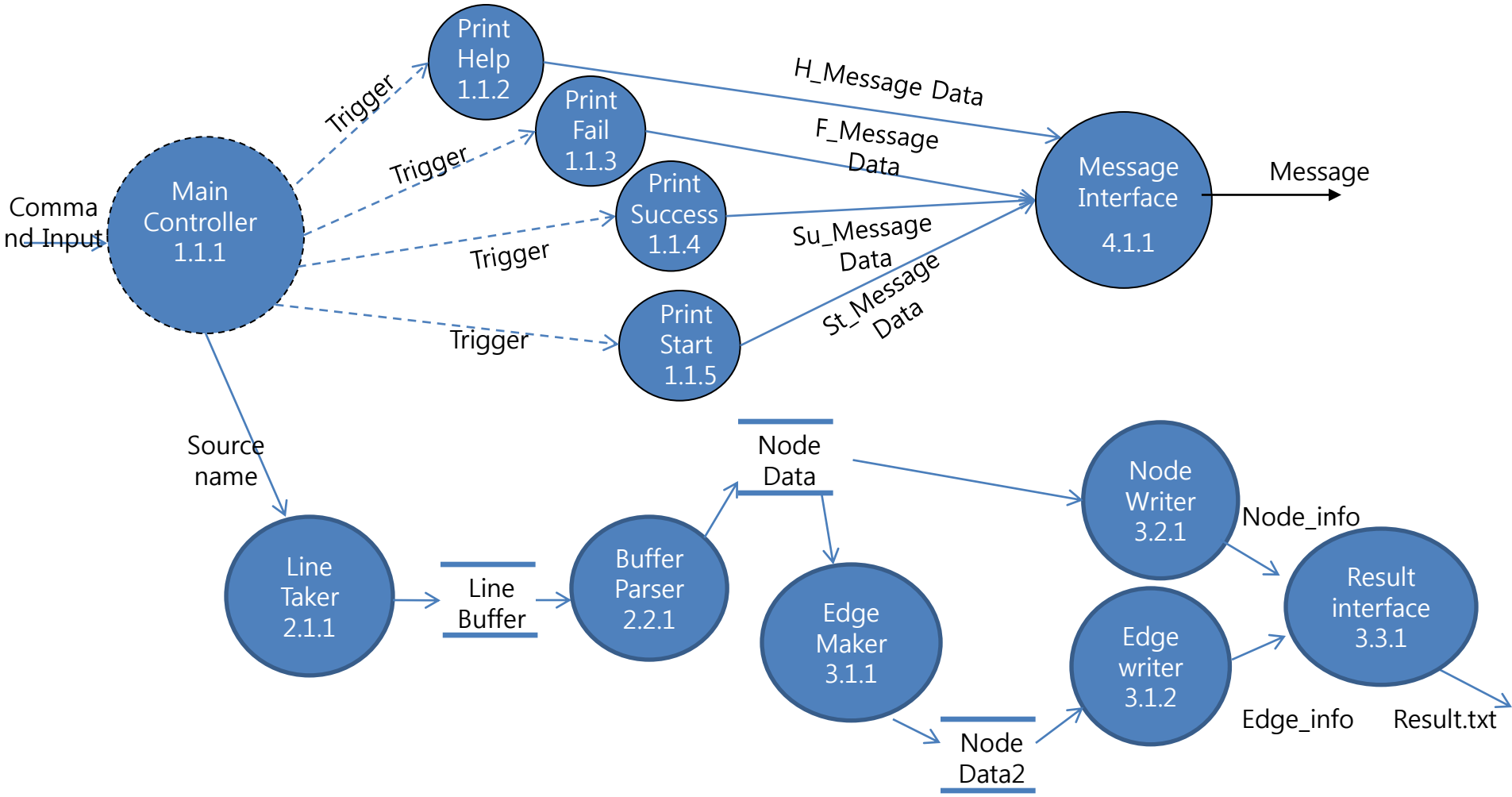
Reference NO.	3.1
Name	Edge Process
Input	Line Data
Output	Edge info
Process Description	Receive the line Data and covert it into Edge info. And then send the Edge info to result interface.

Reference NO.	3.2
Name	Node Writer
Input	line data
Output	Node info
Process Description	Draw node line to result file corresponding each case

Process Specification– DFD level 2

Reference NO.	3.3
Name	Result interface
Input	Node info, Edge info
Output	Result.txt
Process Description	Send the proper information that will be converted into CFG Report.txt

DFD level 3 – CFG Generator



Process Specification– DFD level 3

Reference NO.	1.1.1
Name	Main Controller
Input	Command Input
Output	Trigger
Process Description	Trigger proper Printer.

Reference NO.	1.1.2
Name	Print Help
Input	Trigger
Output	H_Message data
Process Description	Send H_Message data to Message Interface.

Process Specification– DFD level 3

Reference NO.	1.1.3
Name	Print fail
Input	Trigger
Output	F_Message data
Process Description	Send F_Message data to Message Interface.

Reference NO.	1.1.4
Name	Print Success
Input	Trigger
Output	Su_Message data
Process Description	Send Su_Message data to Message Interface.

Process Specification– DFD level 3

Reference NO.	1.1.5
Name	Print Start
Input	Trigger
Output	St_Message data
Process Description	Send St_Message data to Message Interface.

Reference NO.	4.1.1
Name	Message interface
Input	Message Data
Output	Message
Process Description	Convert Message data into Message that can be send to Message printer.

Process Specification– DFD level 2

Reference NO.	2.1.1
Name	Line Taker
Input	Source Name
Output	Node Data
Process Description	Get line by line in C source

Reference NO.	2.2.1
Name	Buffer Parser
Input	Line Buffer
Output	Node Data
Process Description	Get buffer data and parse data need to make CFG

Process Specification– DFD level 3

Reference NO.	3.1.1
Name	Edge Maker
Input	Node Data
Output	Node Data2
Process Description	Convert the Inputed line data into output Node data2 that is about Edge.

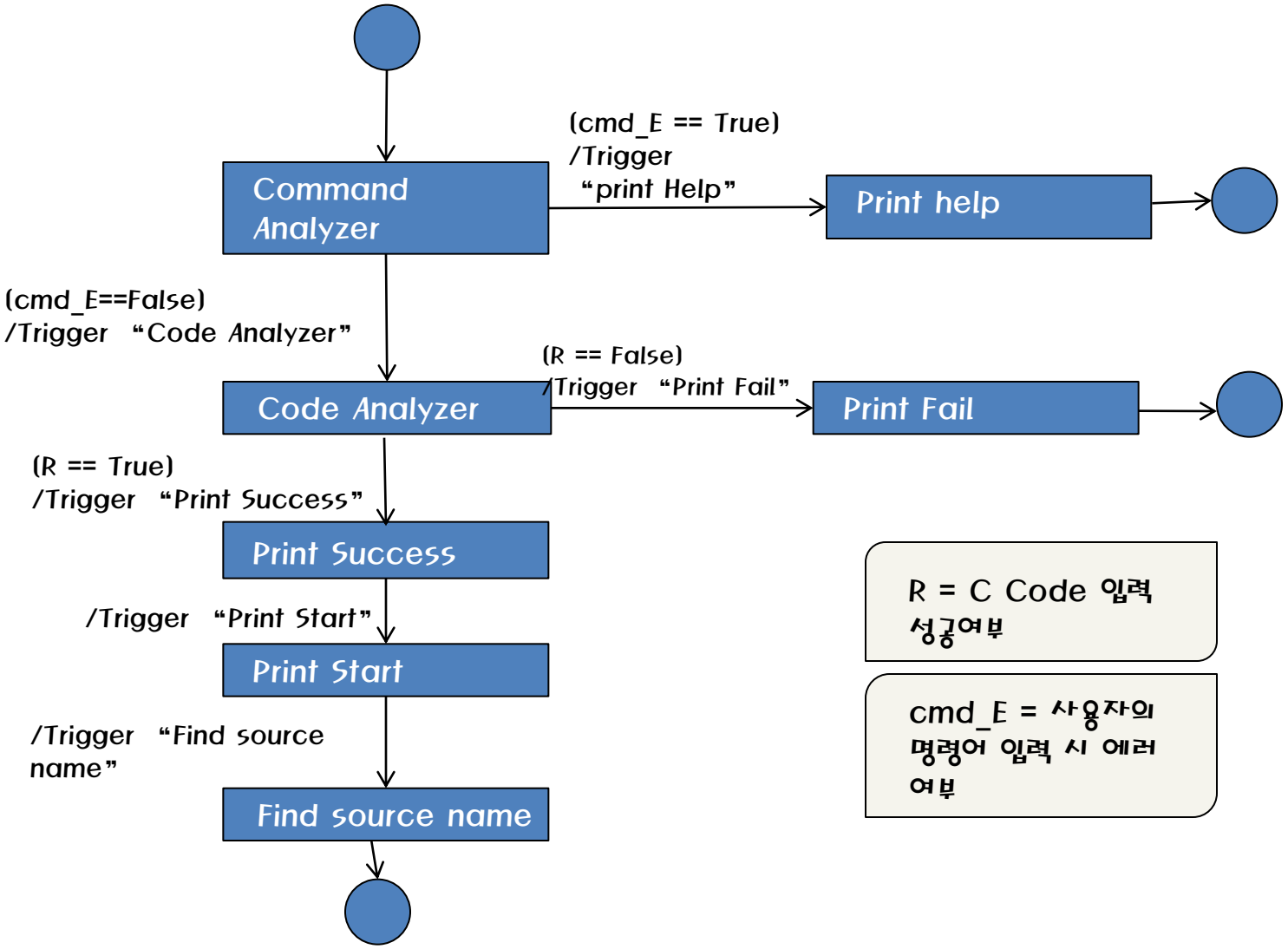
Reference NO.	3.1.2
Name	Edge writer
Input	Node Data2
Output	Edge_Info
Process Description	Receive the Node data2 and convert it into Edge_info.

Process Specification– DFD level 3

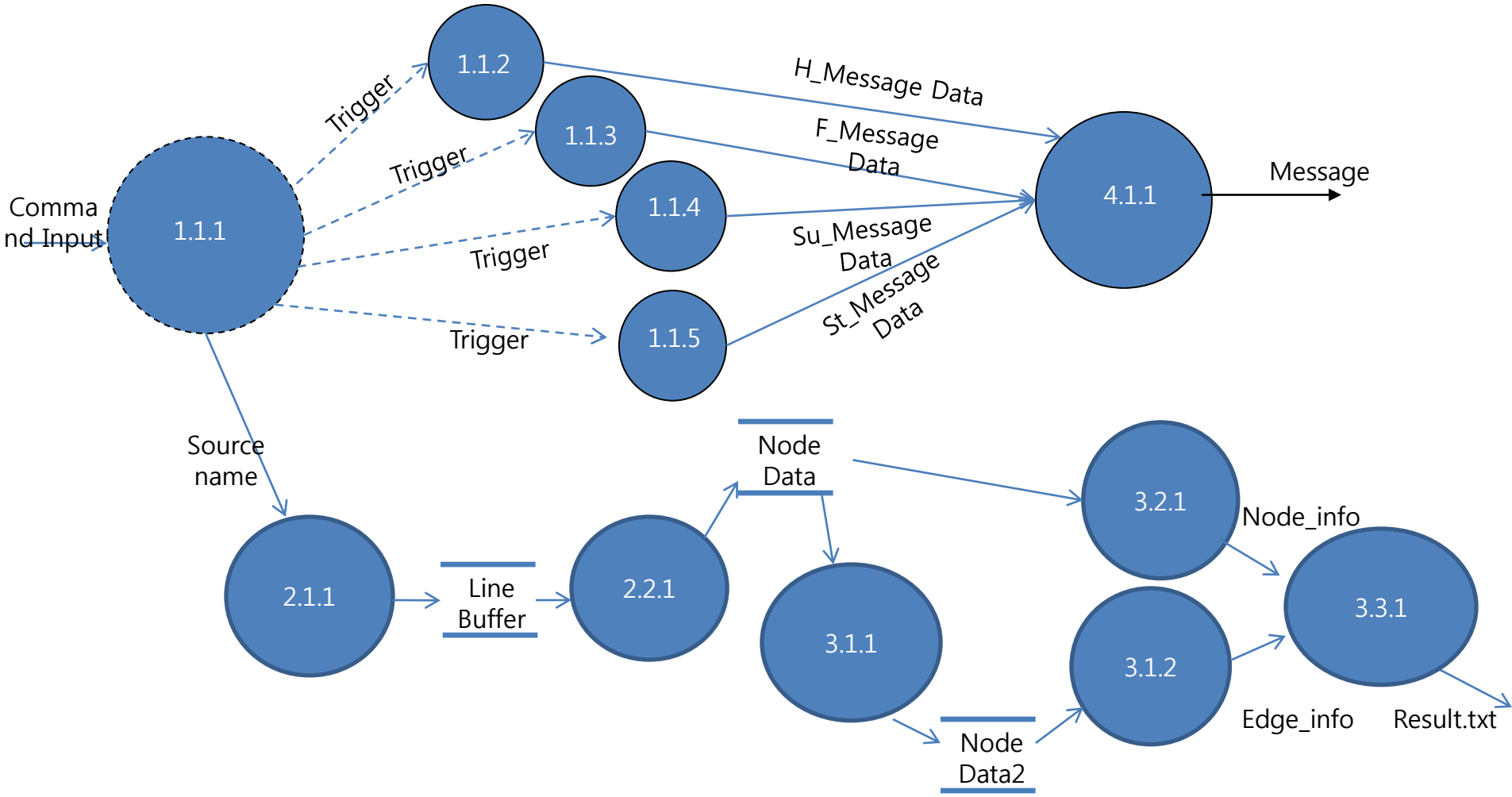
Reference NO.	3.2.1
Name	Node Writer
Input	Node data
Output	Node_info
Process Description	Draw node line to result file corresponding each case

Reference NO.	3.3.1
Name	Result interface
Input	Node_info, Edge_info
Output	Result.txt
Process Description	Send the proper information that will be converted into CFG Report.txt

DFD level 4 – CFG Generator



DFD Overview – CFG Generator



CFG Generator

Structured Design

Structured Charts (Advanced)