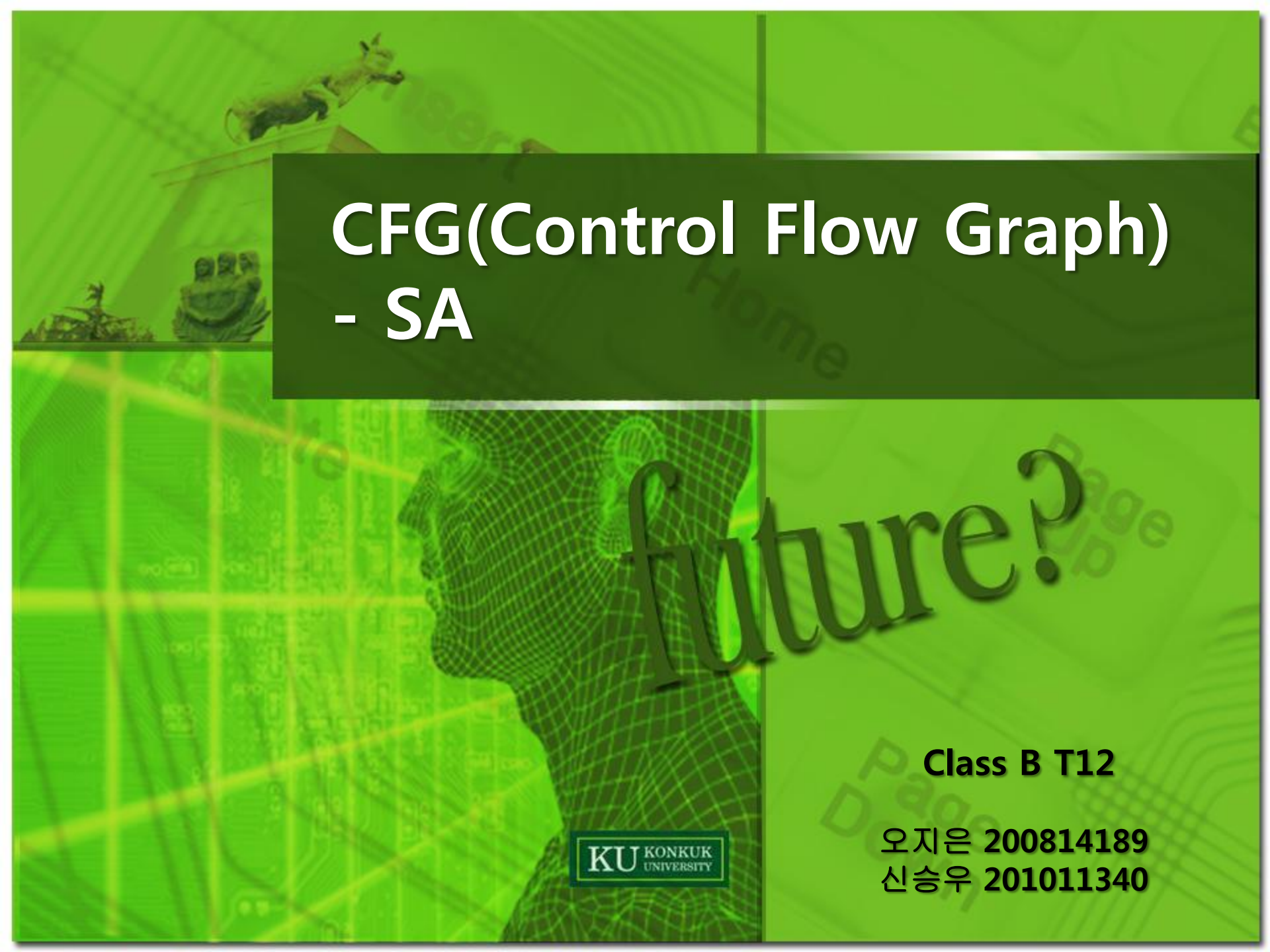
CFG(Control Flow Graph) - SA



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Class B T12

오지은 200814189
신승우 201011340

Contents

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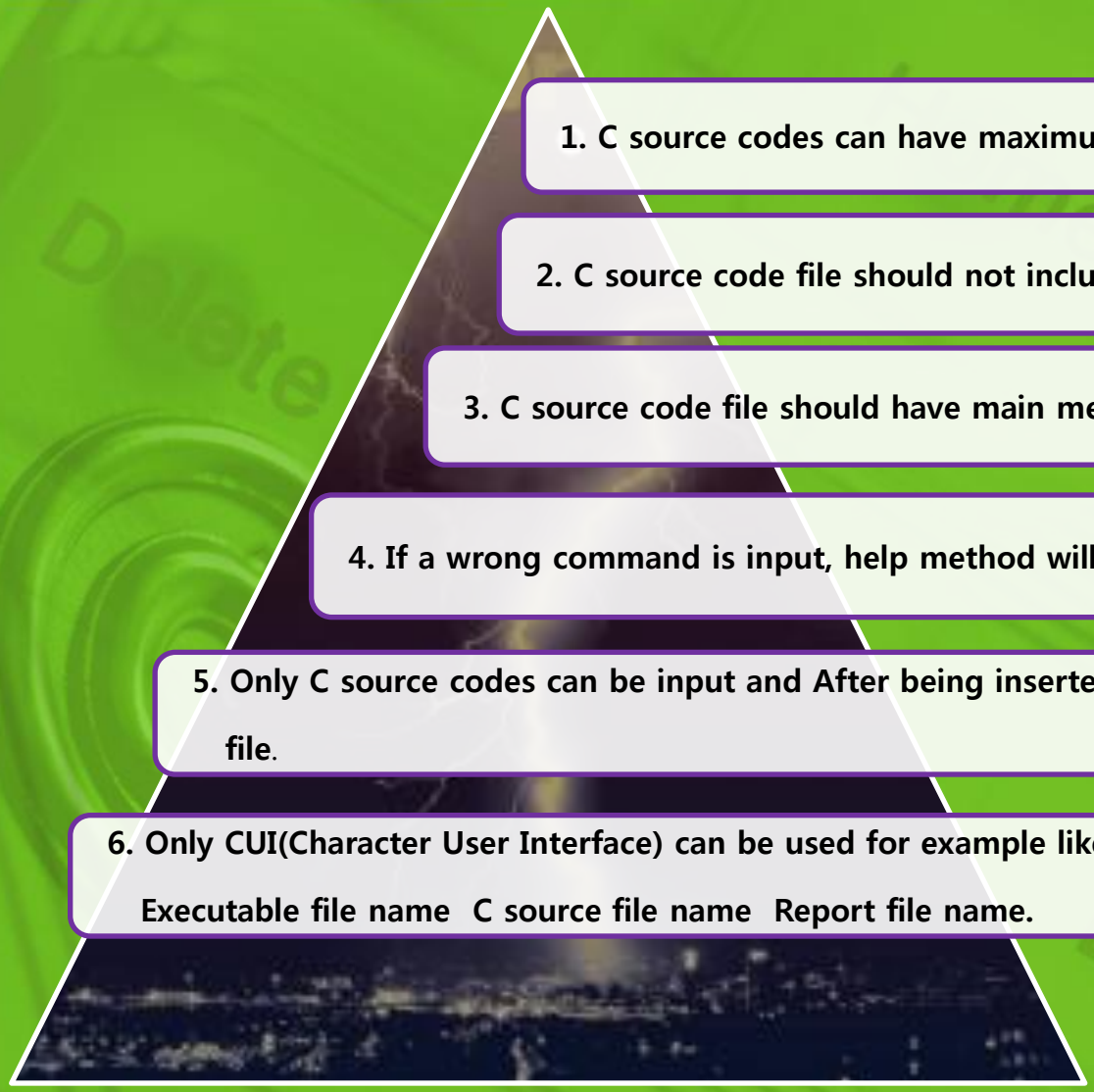
Statement of Purpose

Statement of Purpose



1. C source codes can have maximum 200 lines.
2. C source code file should not include pointers.
3. C source code file should have main method.
4. If a wrong command is input, help method will be printed.
5. Only C source codes can be input and After being inserted, it will be converted CFG with a text file.
6. Only CUI(Character User Interface) can be used for example like this. /CG Inputcode.c result.txt
   Executable file name C source file name Report file name.

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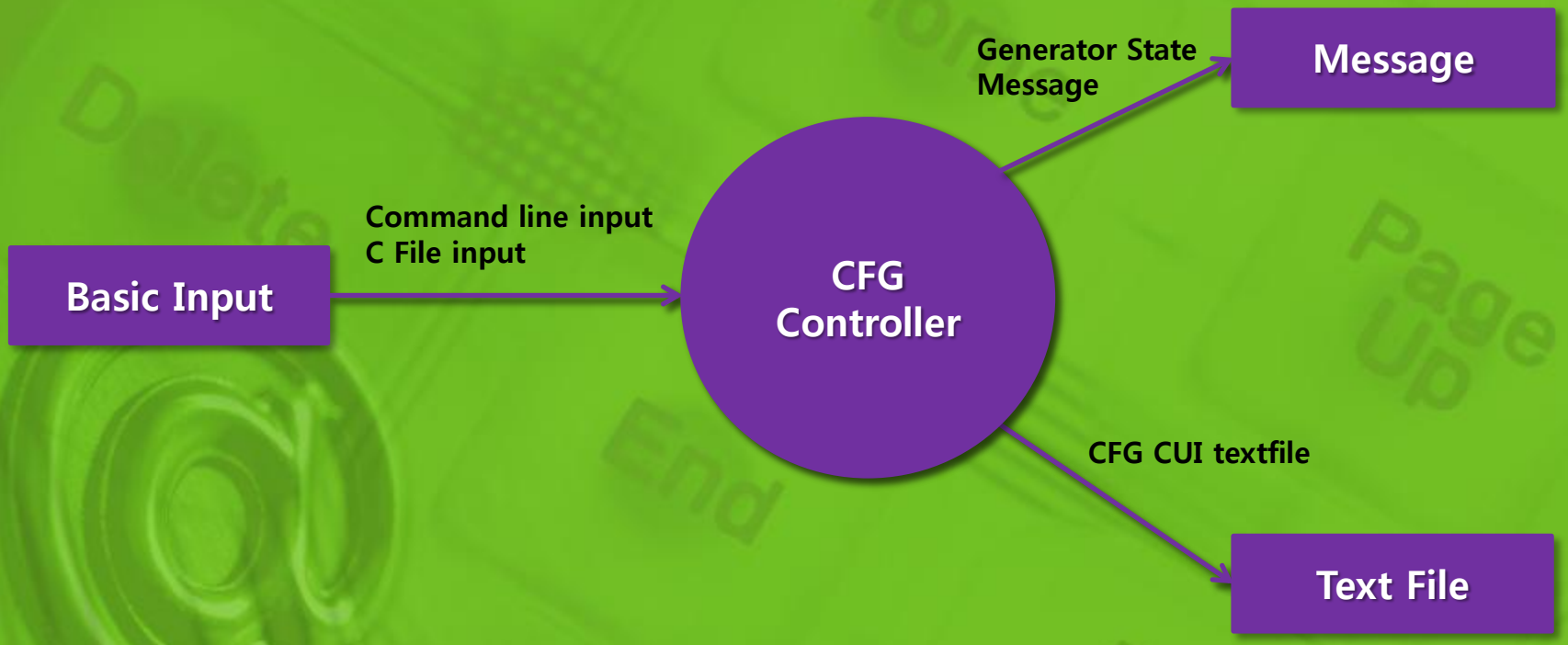
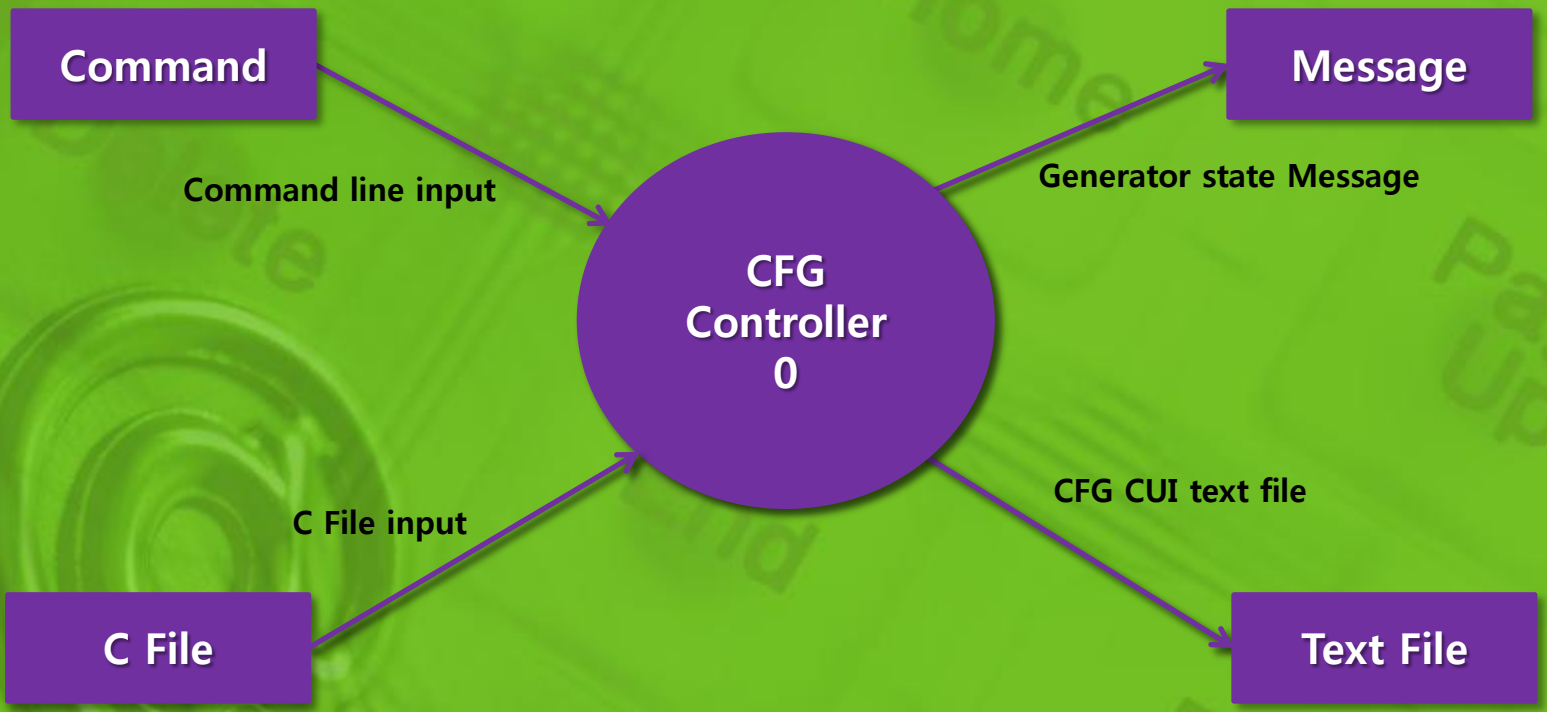
CFG(Control Flow Graph)

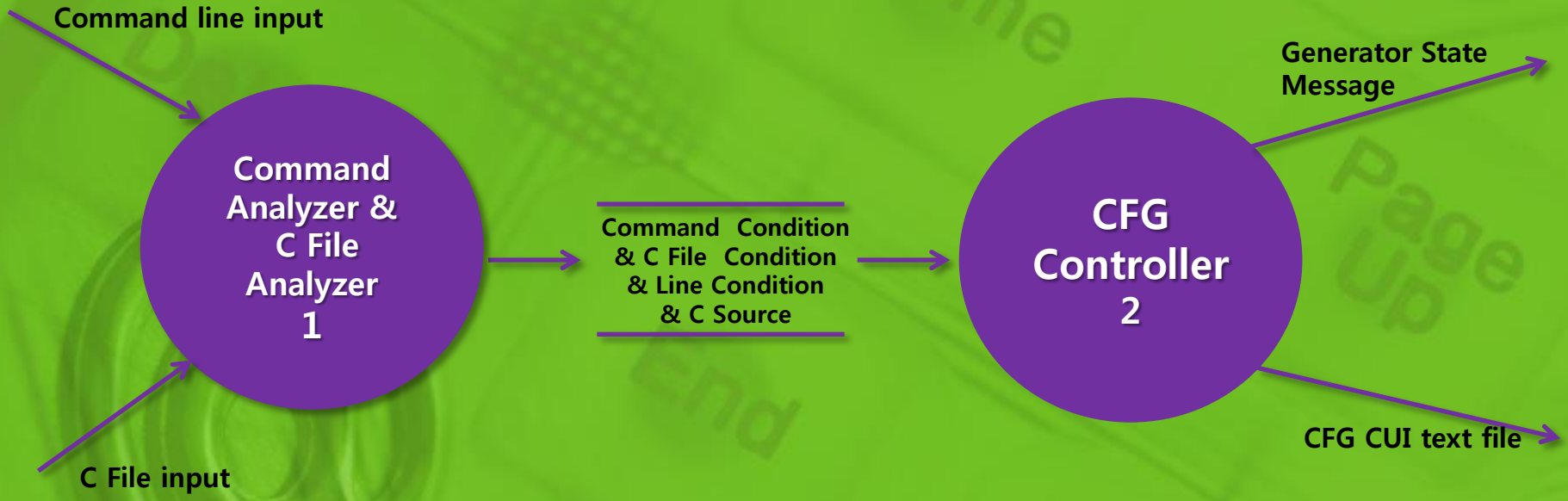
System Context Diagram



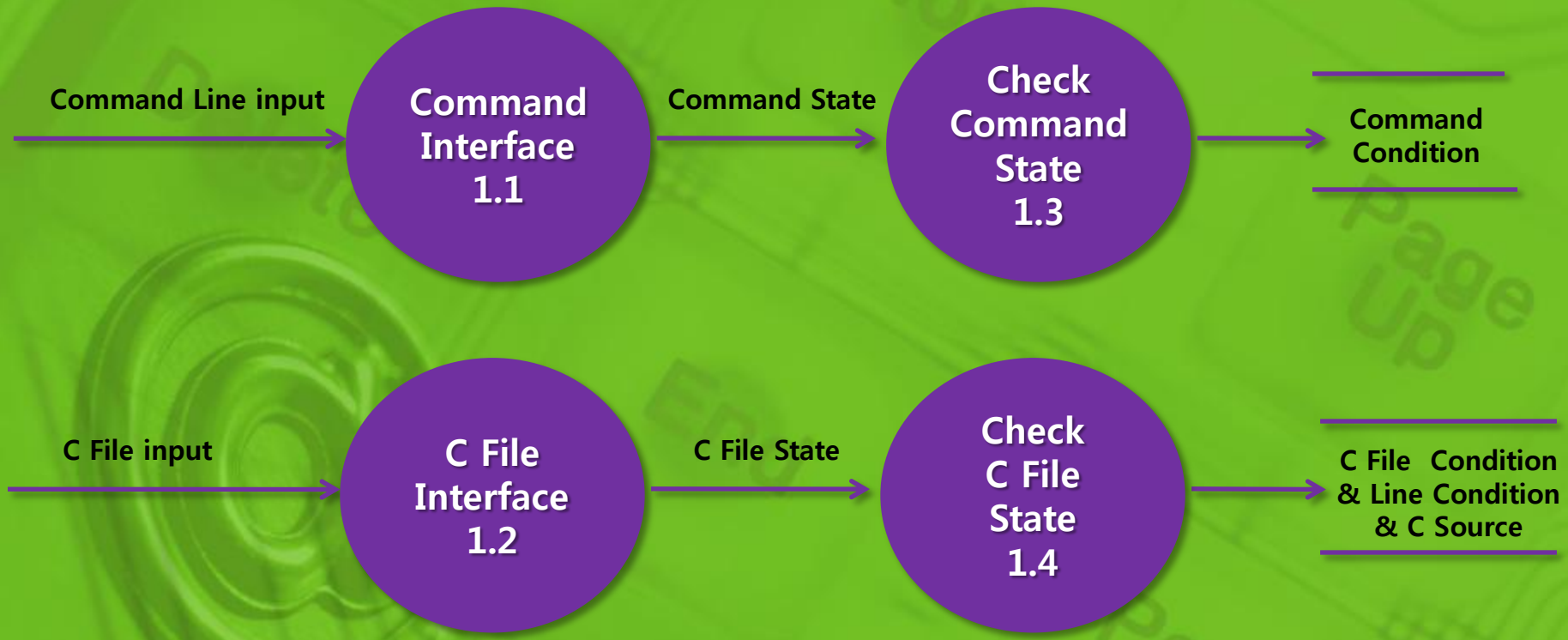
CFG Level 0



CFG Level 1


Command line input
Command Analyzer & C File Analyzer 1
C File input
Command Condition & C File Condition & Line Condition & C Source
CFG Controller 2
Generator State Message
CFG CUI text file

CFG Level 2



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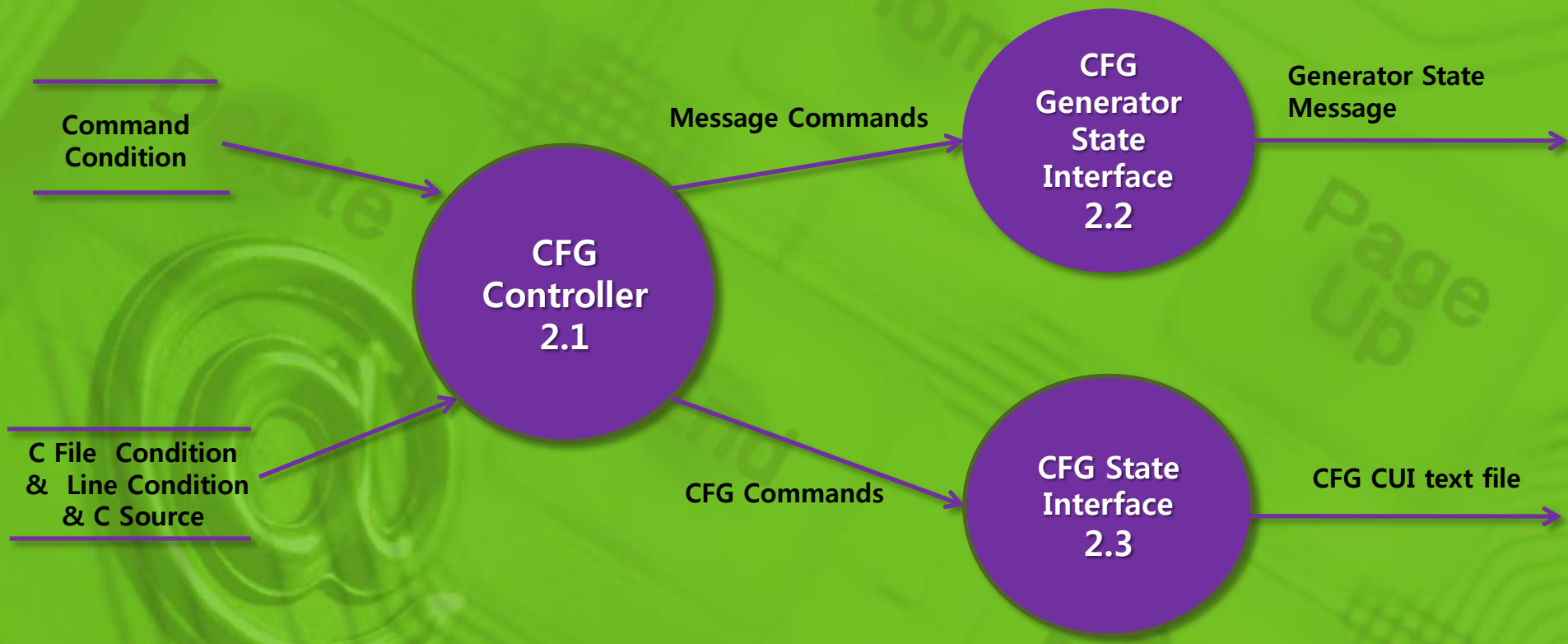
CFG Level 2 (cont.)



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Data Store (Command Condition)

Command Condition

Data Type	Data Format
Correct Command	True / False

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Data Store (C File Condition)

C File Condition
& Line Condition
& C Source

Data Type	Data Format
C File Existence	True / False
C filename	String
C File Qualified	True / False

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Data Store (Line Condition)

C File Condition
& Line Condition
& C Source

Data Type	Data Format
Top of Block	True / False
Edges	Integer
Last Line	True / False

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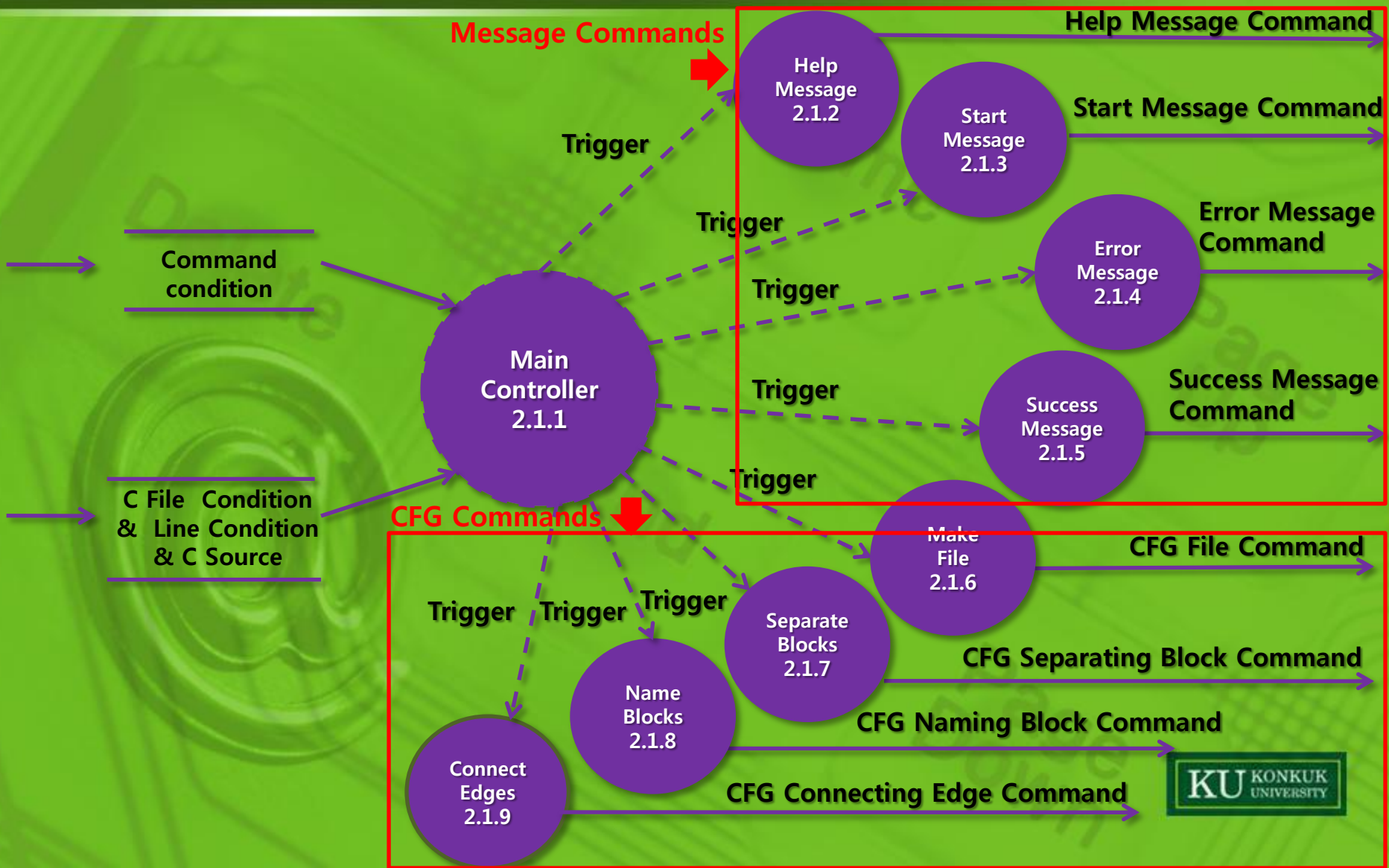
Data Store (C Source)

C File Condition
& Line Condition
& C Source

Data Type	Data Format
C Source	C code

CFG Level 3


Message Commands
Help Message Command
Help Message 2.1.2
Start Message 2.1.3
Start Message Command
Trigger
Trigger
Error Message Command
Error Message 2.1.4
Trigger
Command condition
Main Controller 2.1.1
Trigger
Success Message 2.1.5
Success Message Command
Trigger
C File Condition & Line Condition & C Source
CFG Commands
Make File 2.1.6
CFG File Command
Trigger
Trigger
Trigger
Separate Blocks 2.1.7
CFG Separating Block Command
Name Blocks 2.1.8
CFG Naming Block Command
Connect Edges 2.1.9
CFG Connecting Edge Command
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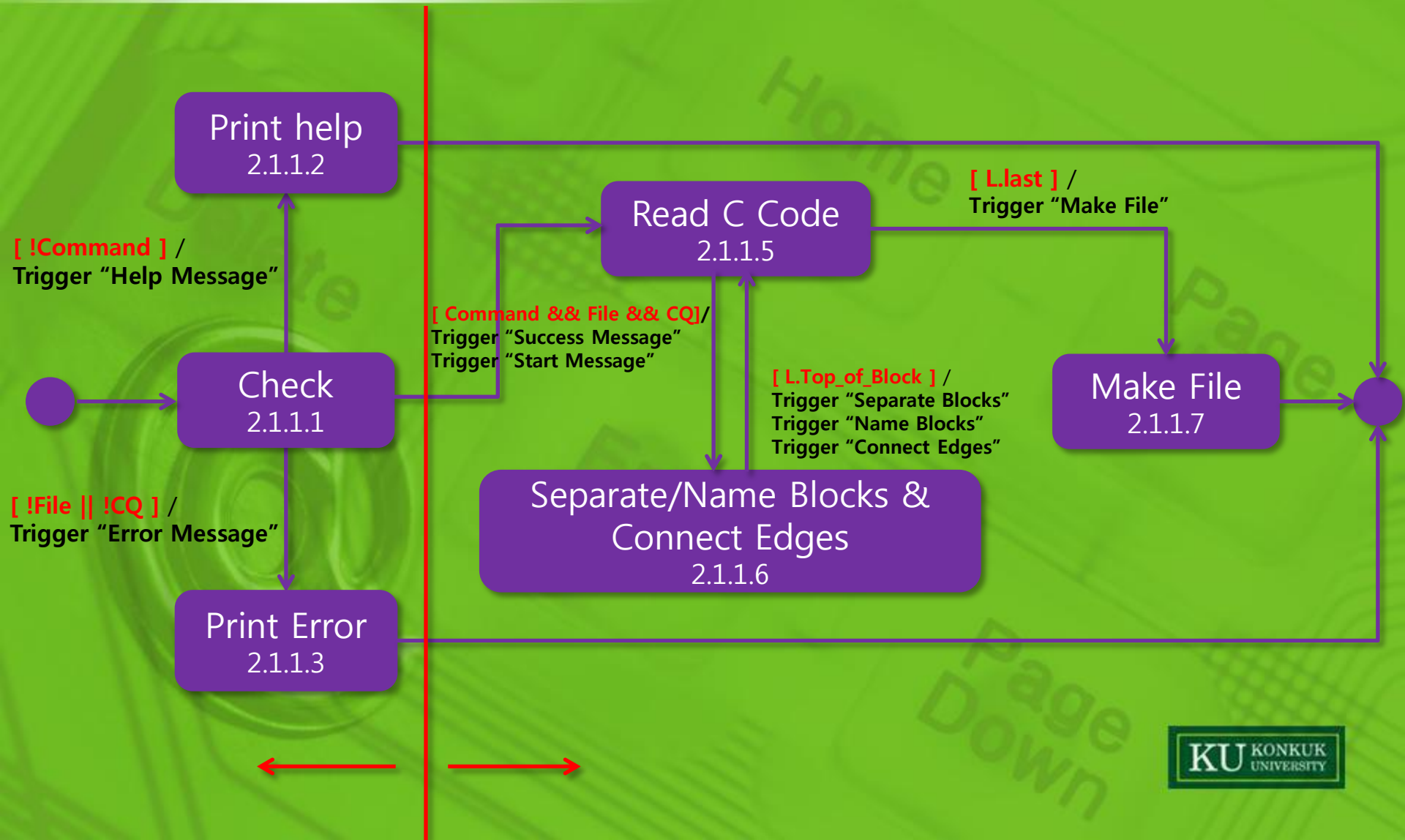
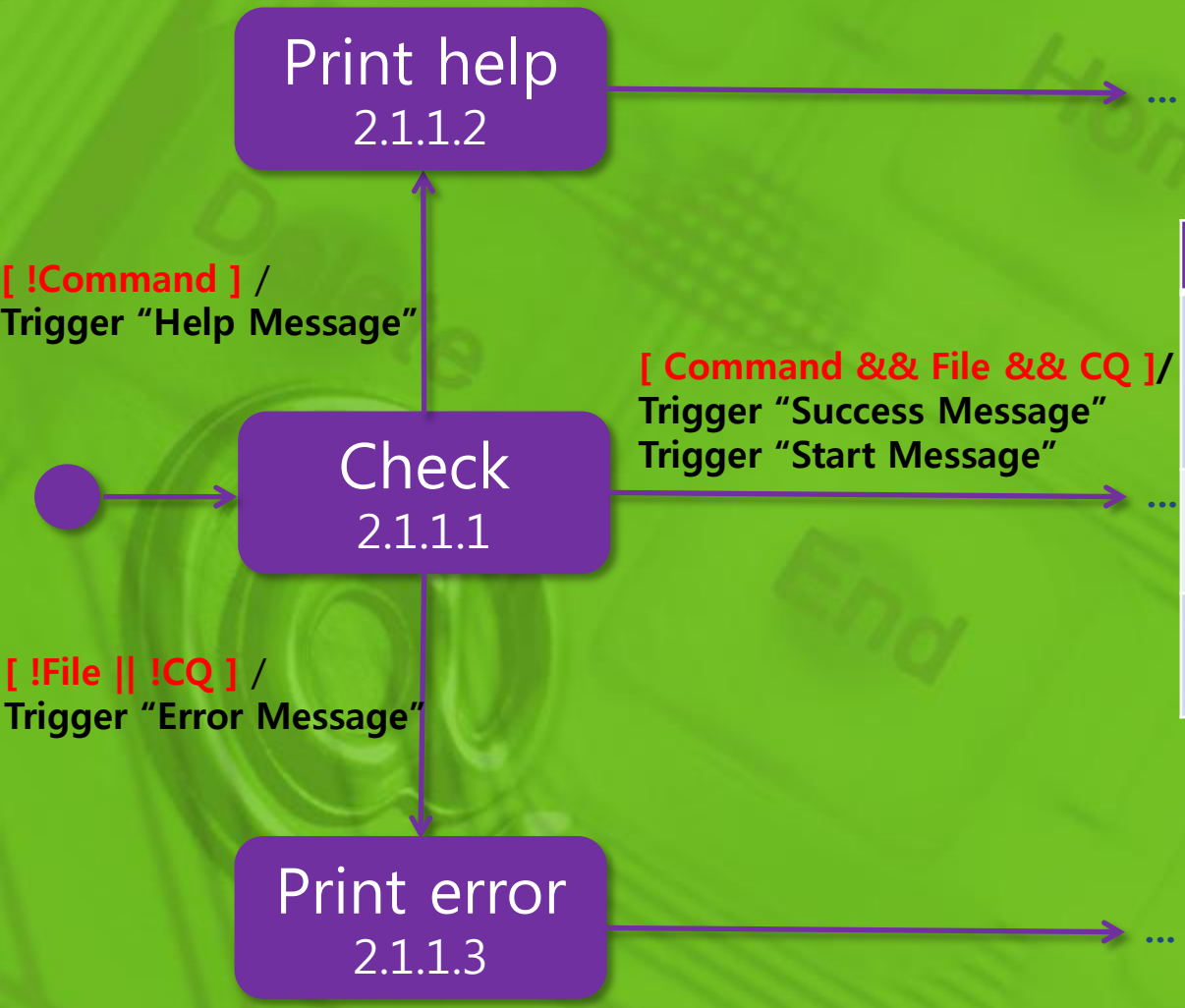
CFG Level 4


Print help
2.1.1.2
Read C Code
2.1.1.5
[L.last] /
Trigger "Make File"
[!Command] /
Trigger "Help Message"
[Command && File && CQ]/
Trigger "Success Message"
Trigger "Start Message"
Check
2.1.1.1
[L.Top_of_Block] /
Trigger "Separate Blocks"
Trigger "Name Blocks"
Trigger "Connect Edges"
Make File
2.1.1.7
Separate/Name Blocks &
Connect Edges
2.1.1.6
[!File || !CQ] /
Trigger "Error Message"
Print Error
2.1.1.3

CFG Level 4 (Expand.)



Word	Definition
Command	Correct command? (Command Condition)
File	File existence (C File Condition)
CQ	Qualified C code? (C File Condition)

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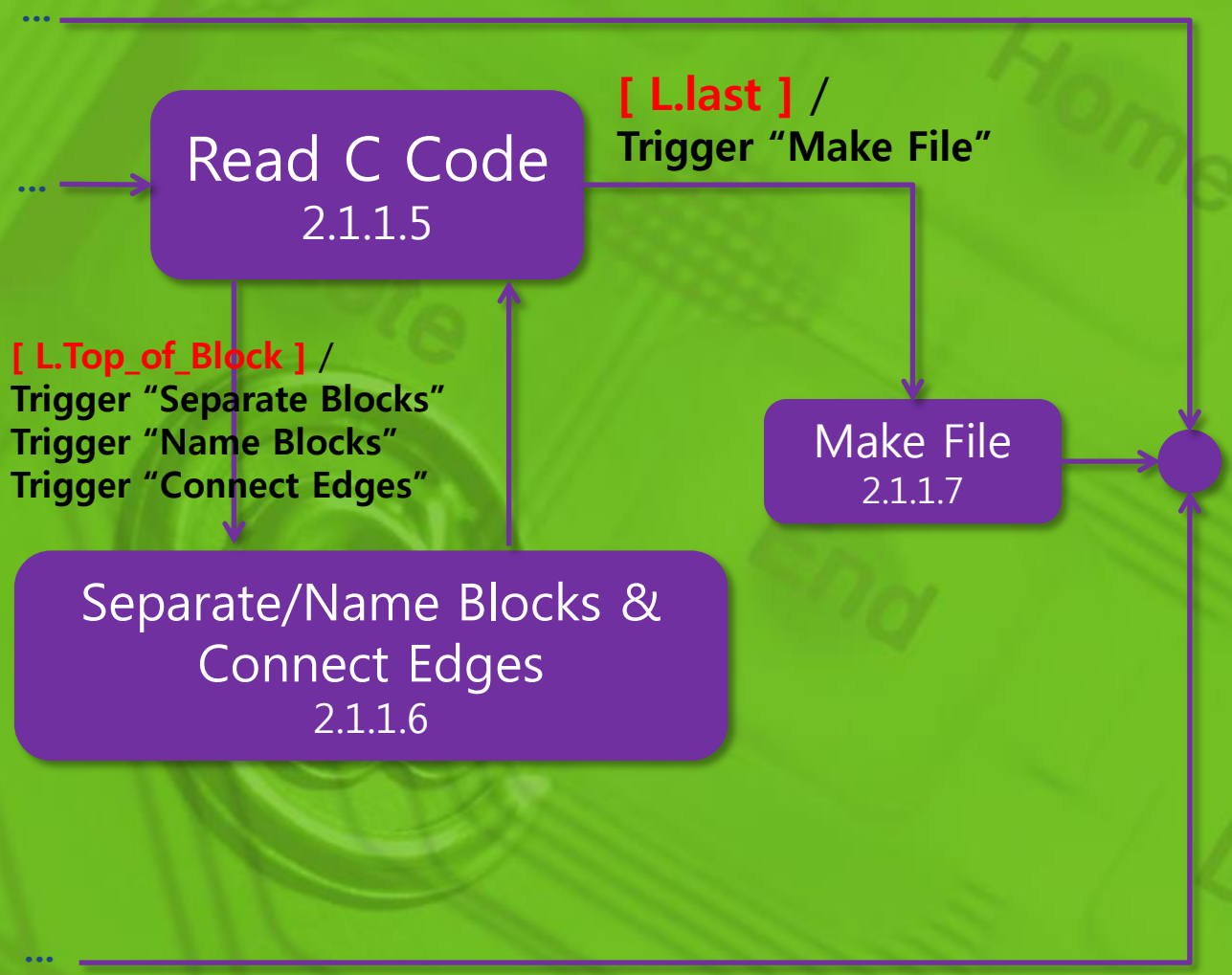
CFG Level 4 (Expand.)



Word	Definition
L.Top_of_ Block	Top line of the block? (Line Condition)
L.last	Last line in C code? (Line Condition)

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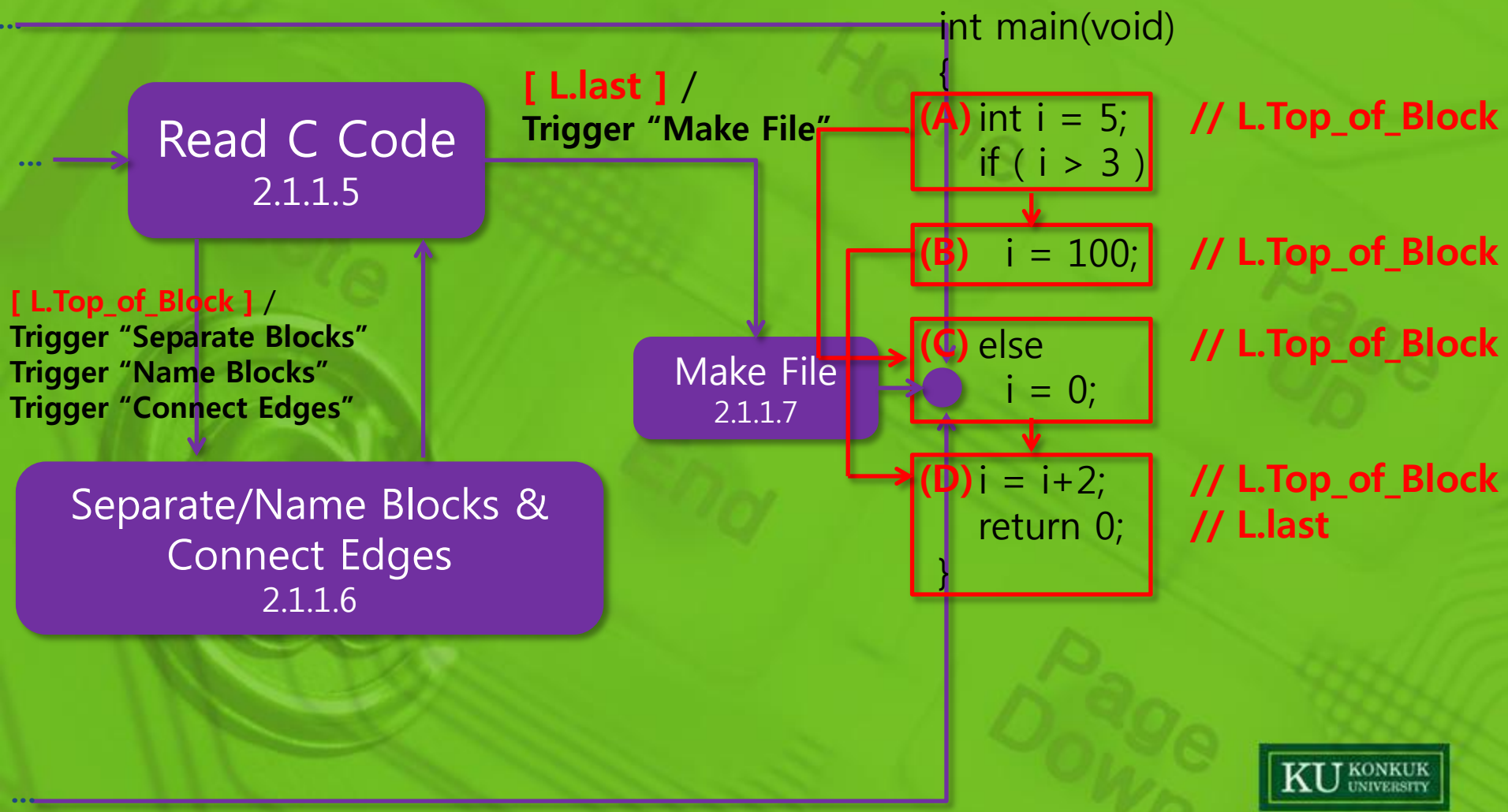
CFG Level 4 (Expand.)



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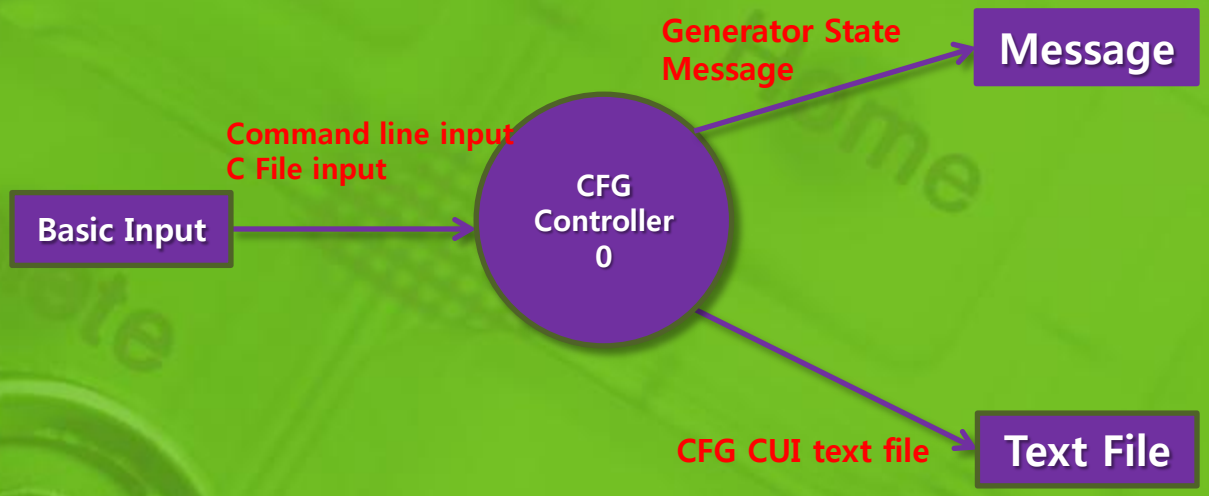
Event List

Event List



Input / Output Event	Description
Command line input	Command line in Basic Input
C File input	C File that defined in Basic Input
Generator State Message	Message showing generator's running state
CFG CUI textfile	Text file that generated CFG from C Code

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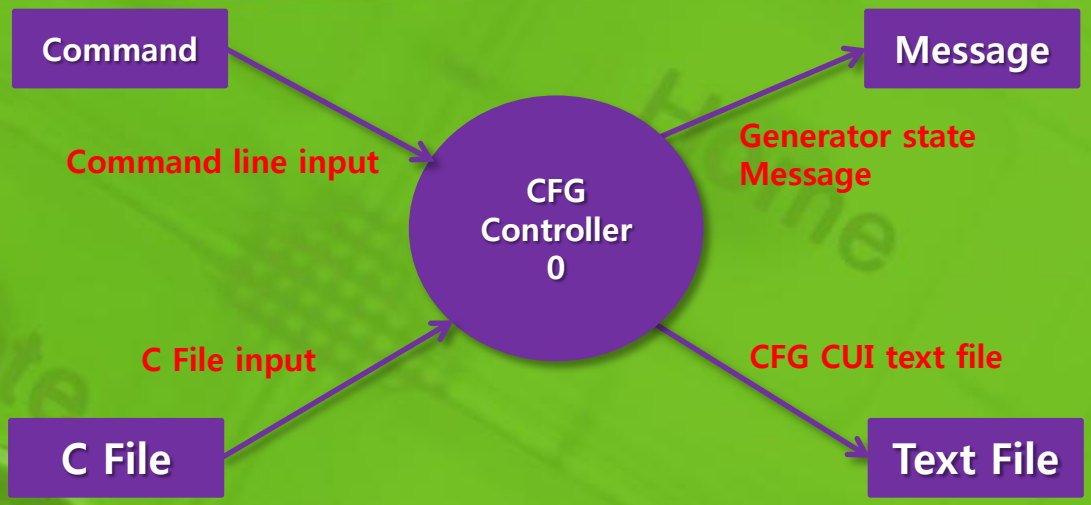
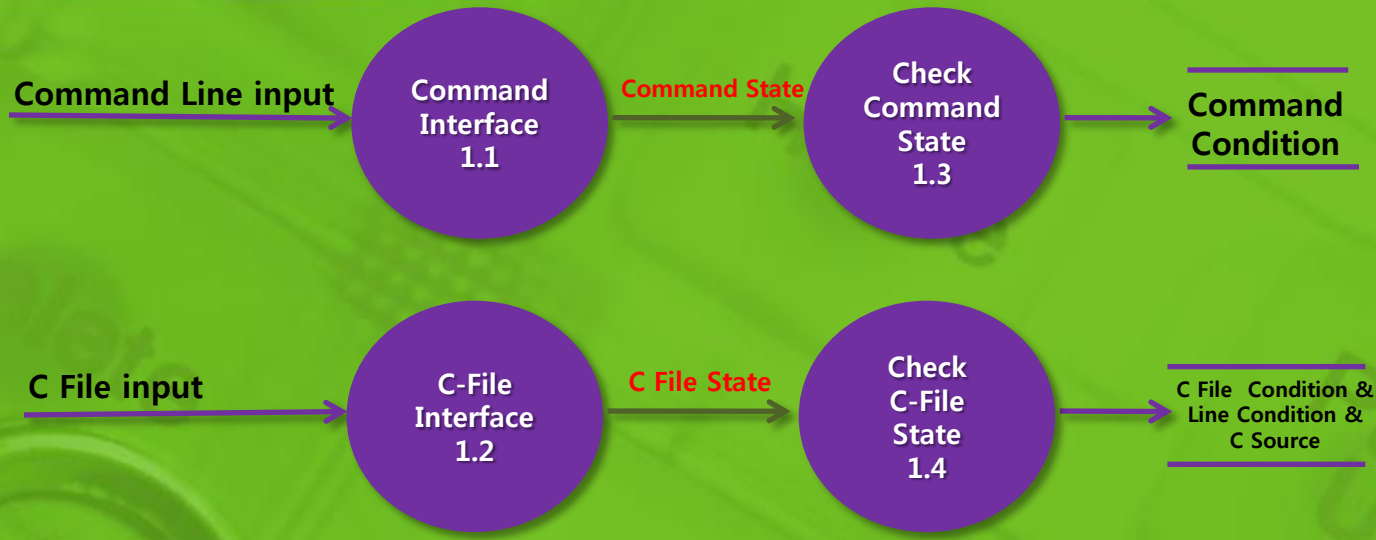
Data Dictionary

Data Dictionary (Level 0)



Input / Output Event	Description	Format / Type
Command line input	Command line in Basic Input	String
C File input	C File that defined in Basic Input	File / *.c file
Generator State Message	Message show generator's running state	String
CFG CUI textfile	Text file that generated CFG from C Code	File / *.txt file

Data Dictionary (Level 2)



Input / Output Event	Description	Format / Type
Command State	Set data that showing input command state.	String
C File State	Set data that showing input C File State.	File / *.c file

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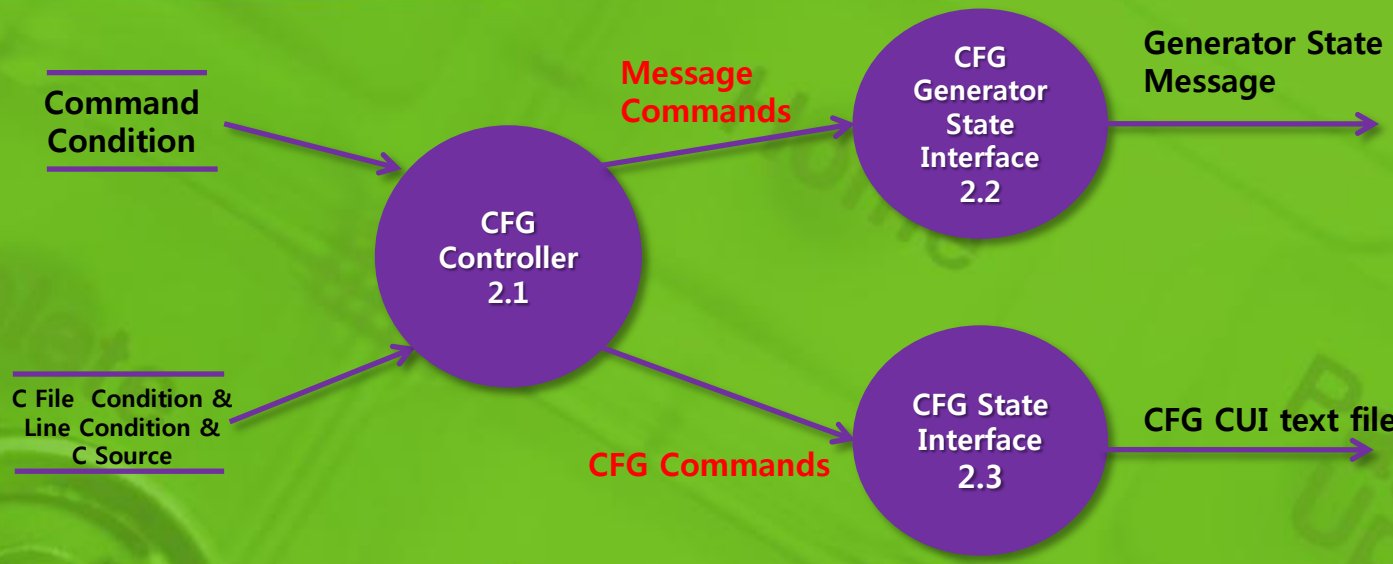
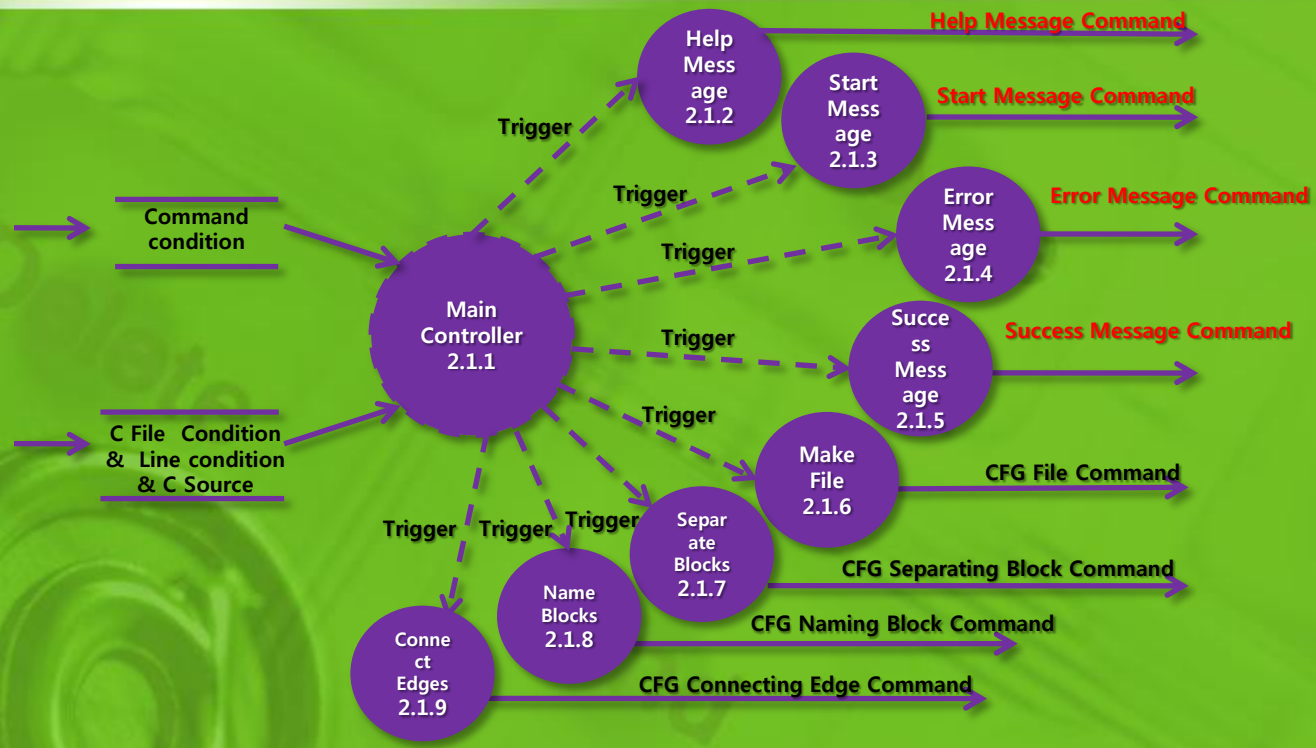
Data Dictionary (Level 2)



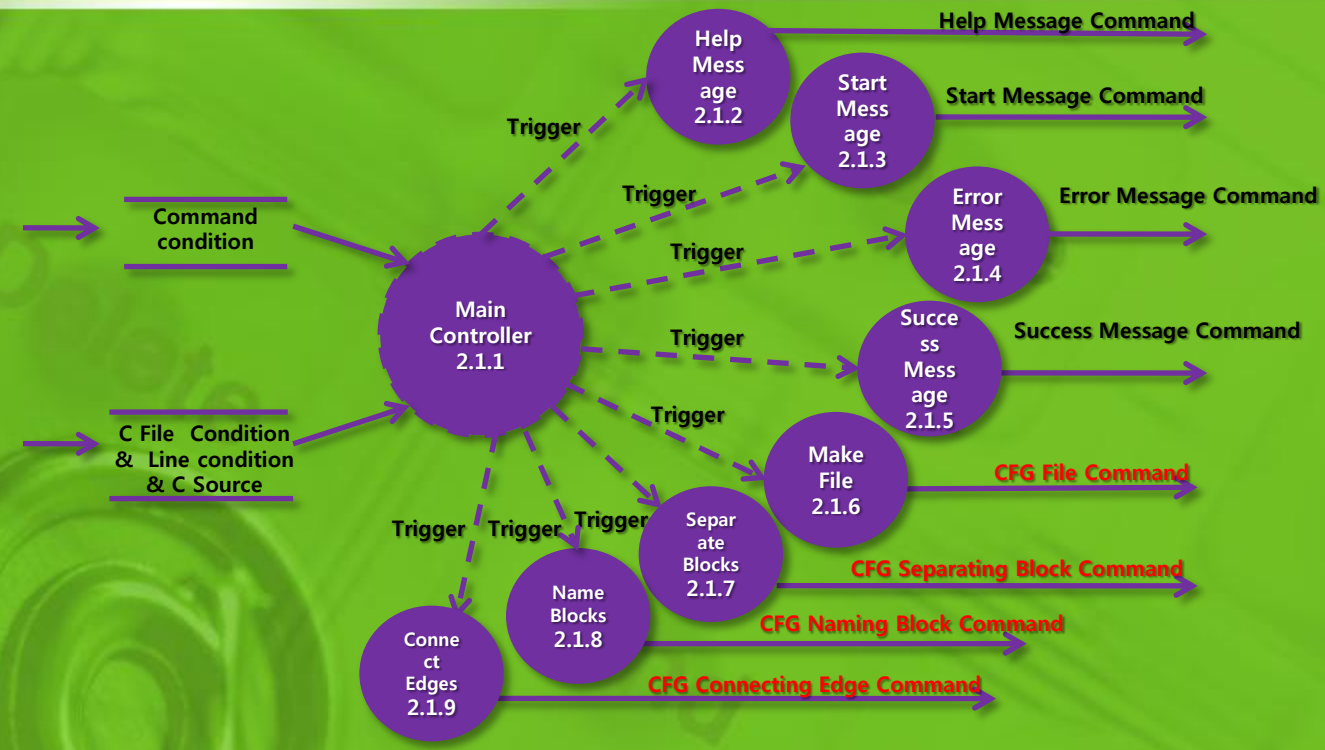
Input / Output Event	Description	Format / Type
Message Commands	Commands are a group of Message command that will print out current state. [Help / Start / Success / Error Message]	Command
CFG Commands	Theses commands will be needed for generating Commands and text file concerning edge and block which are necessary to draw CFG. [File / Separating Blocks / Naming Blocks / Connecting Edges]	Command

Data Dictionary (Level 3)



Input / Output Event	Description	Format / Type
Help Message Command	Command to print help message	Command
Start Message Command	Command to print start message	Command
Error Message Command	Command to print error message	Command
Success Message Command	Command to print success message	Command

Data Dictionary (Level 3)



Input / Output Event	Description	Format / Type
CFG File Command	Command to make text file.	Command
CFG Separating Block Command	Command to separating blocks in CFG	Command
CFG Naming Block Command	Command to naming blocks in CFG	Command
CFG Connecting Edge Command	Command to connect edges in CFG	Command

4 Process Specification

Process Specification (L0)

Reference No.	0
Name	CFG Controller
Input	Command line input, C File input
Output	Message, Text File
Process Description	When command line and C File are input into the CFG Controller, CFG Controller will generate Message and Text File.

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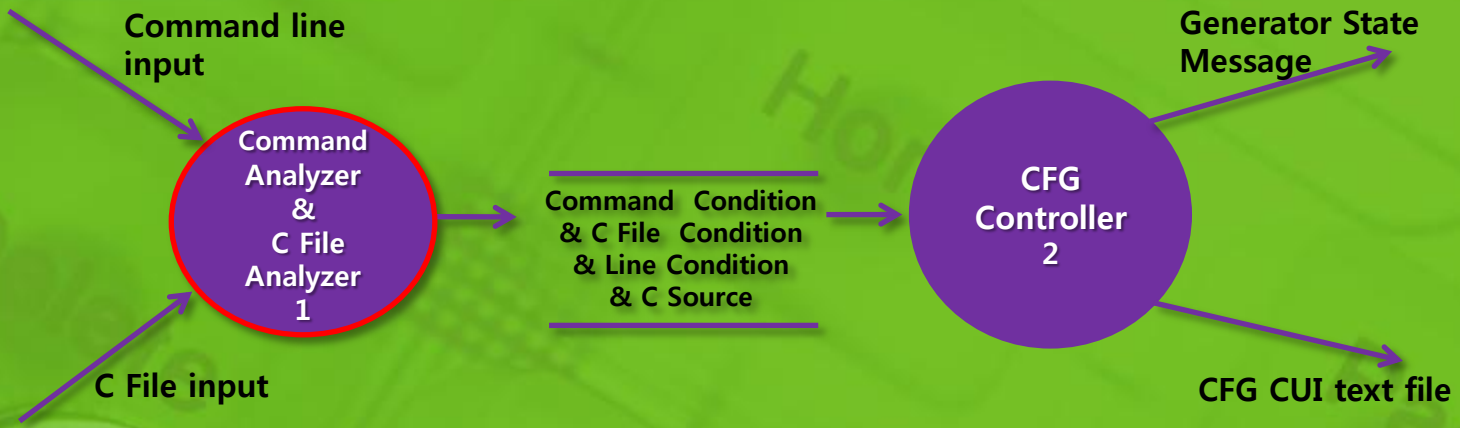
Process Specification (L1)



Reference No.	1
Name	Command Analyzer & C File Analyzer
Input	Command line input, C File input
Output	Command Condition & C File Condition
Process Description	When Command line and C File are input into the controller, they will be handled by Command Analyzer and C File Analyzer respectively and those analyzers will output Command Condition and C File Condition respectively.

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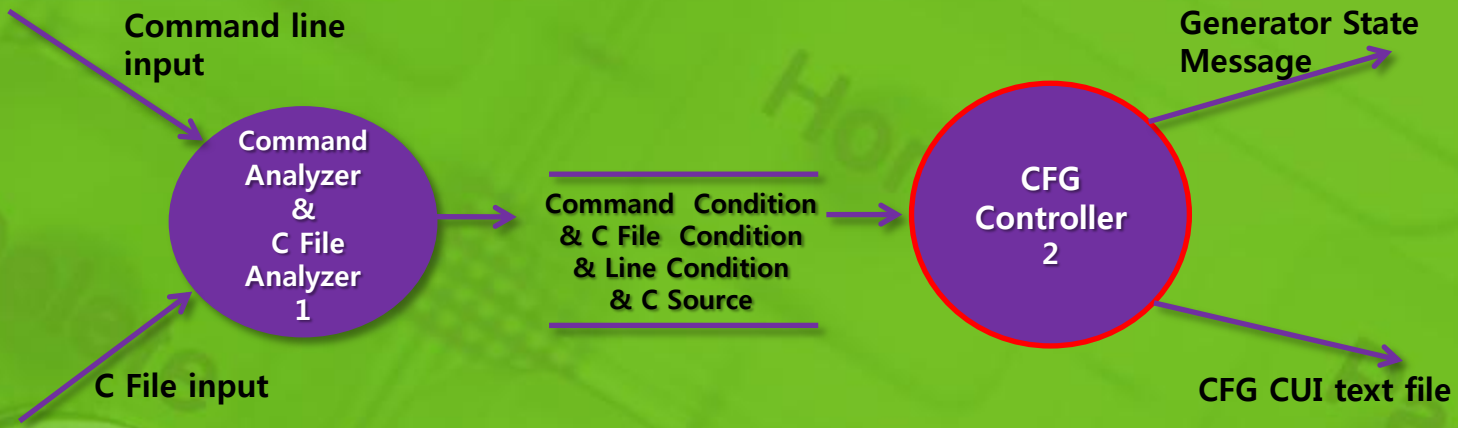
Process Specification (L1)



Reference No.	2
Name	CFG Controller
Input	Command Condition & C File Condition
Output	Generator State Message & CFG CUI text file
Process Description	It would make reference to Data stored in Command Condition and C File Condition and output Generator State Message(concerning Command Condition & C File Condition), CFG CUI text file (concerning C File Condition & Line Condition & C Source).

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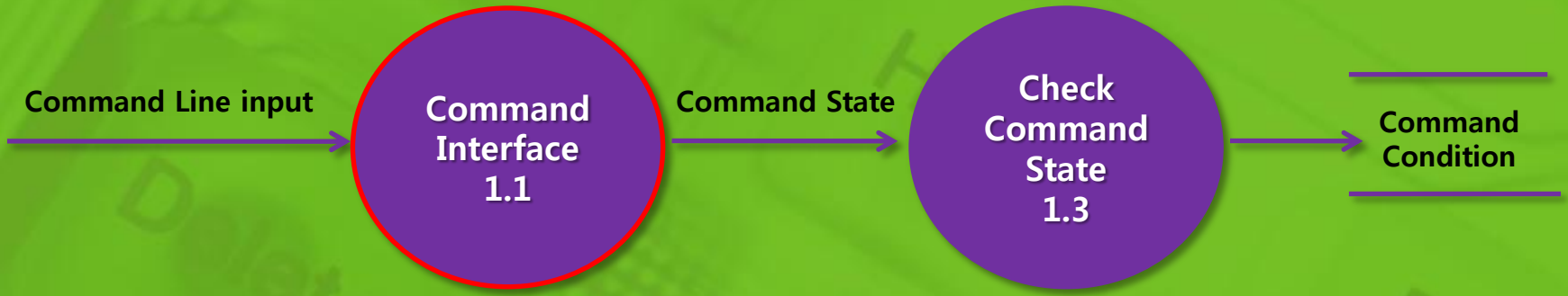
Process Specification (L2)



Reference No.	1.1
Name	Command Interface 1.1
Input	Command Line input,
Output	Command State
Process Description	When Command Line is input into Command Interface 1.1, Command interface 1.1 will convert command line to command state.

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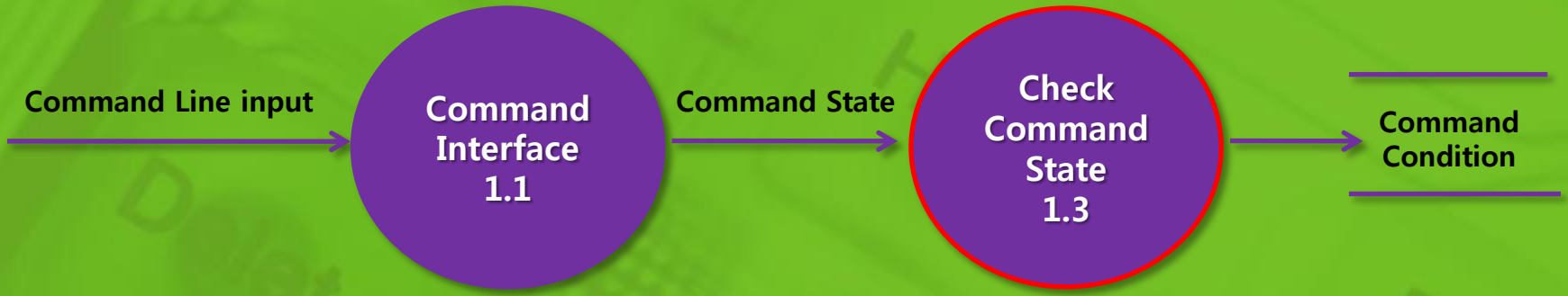
Process Specification (L2)



Reference No.	1.3
Name	Check Command State
Input	Command State
Output	Command Condition
Process Description	When command state is received by Check Command State 1.3, Check Command State 1.3 will store command state in command condition variable.

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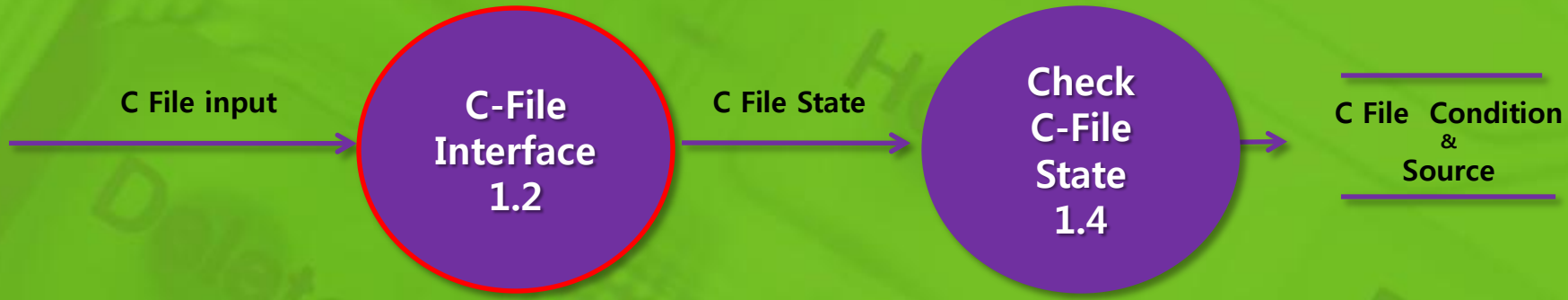
Process Specification (L2)



Reference No.	1.2
Name	C File interface
Input	C File input
Output	C File State
Process Description	When C File input is input into C File interface 1.2, C File interface will convert C File input into C File State.

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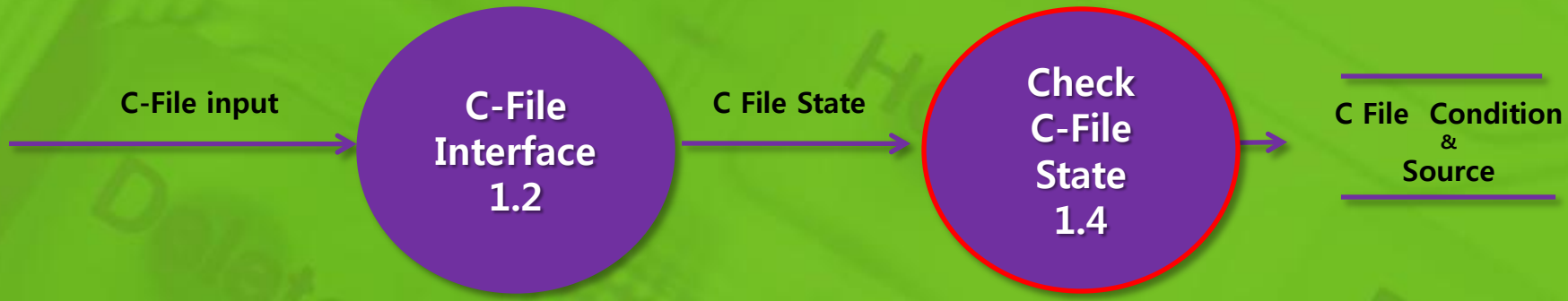
Process Specification (L2)



Reference No.	1.4
Name	Check C-File State
Input	C-File State
Output	C File Condition & Source
Process Description	When C File state is received by Check C File State 1.4, Check C File State will store C File state in C File Condition and Source.

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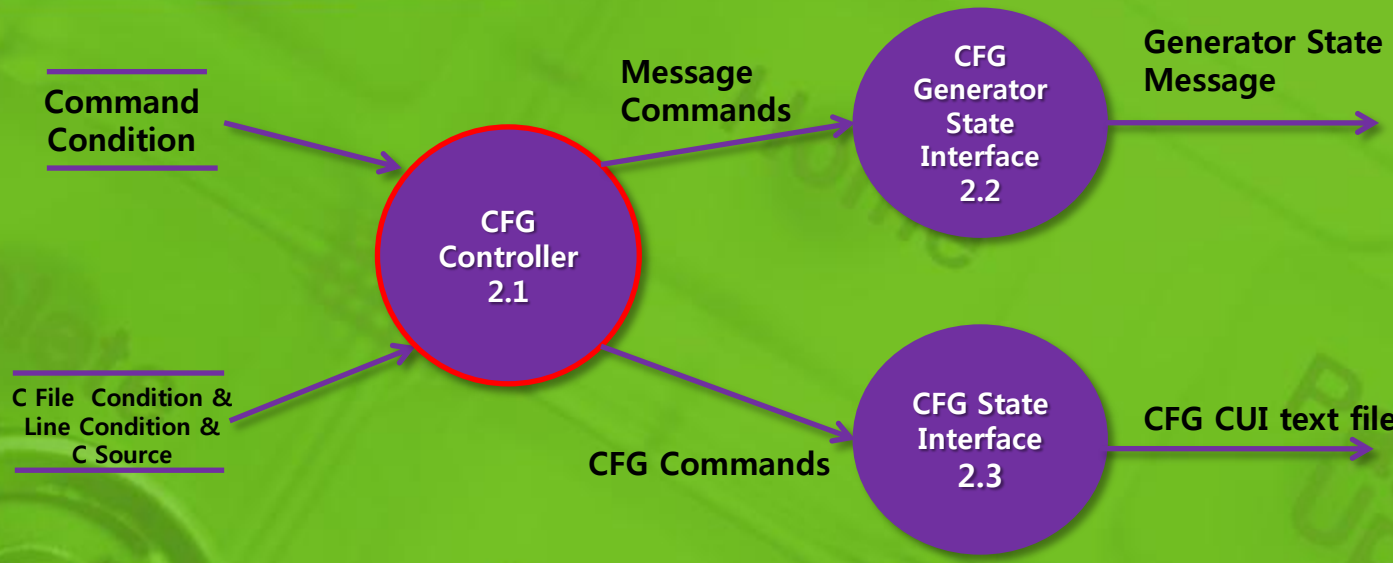
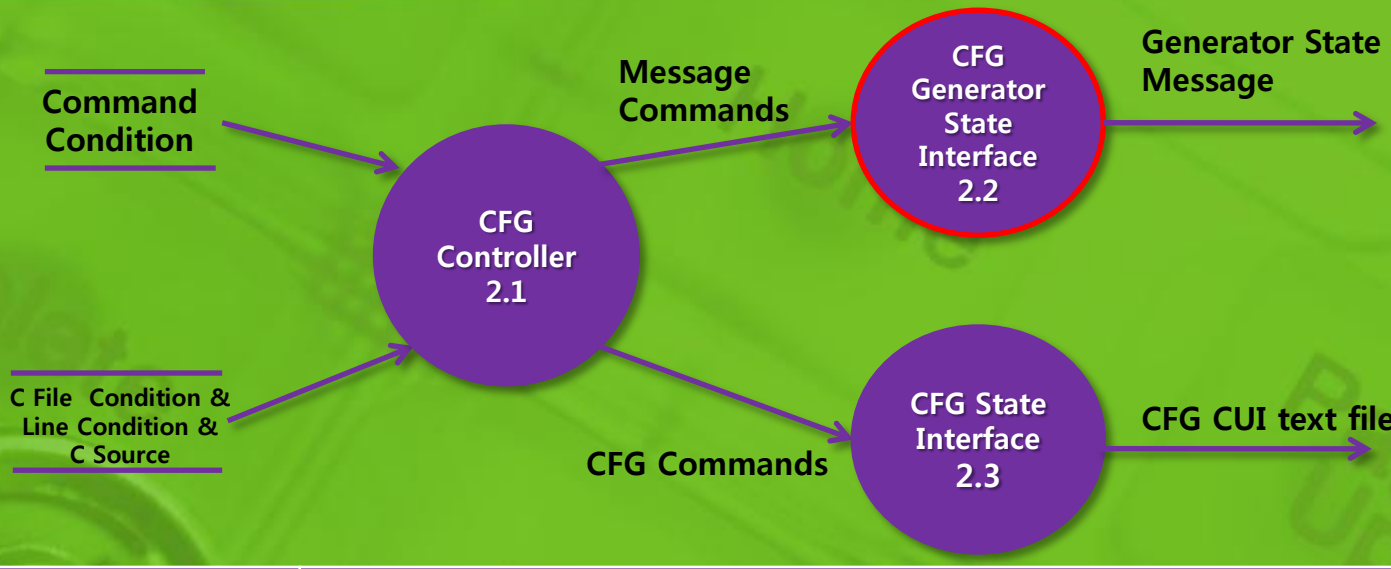
Process Specification (L2)



Reference No.	2.1
Name	CFG Controller
Input	Command Condition & C File Condition & C Source & Line Condition
Output	Message Commands & CFG Commands
Process Description	It would give Message Commands while are needed to refer to Data stored in Command Condition and C File Condition to CFG Generator State Interface Process and also give away CFG Commands that results from C File Condition & Line Condition & C Source to CFG State Interface Process.

Process Specification (L2)



Reference No.	2.1
Name	CFG Generator State Interface
Input	Message Commands
Output	Generator State Message
Process Description	It would store Messaged Command when received and output a type of string into Message, Generator State Message after sorting it out.

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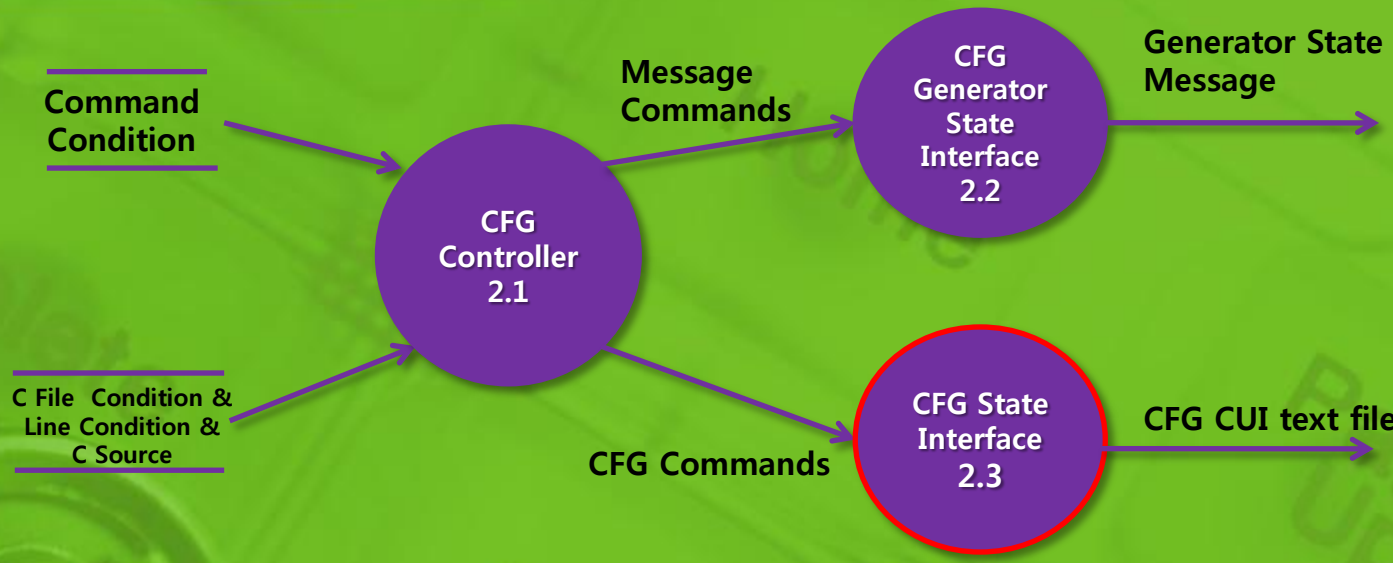
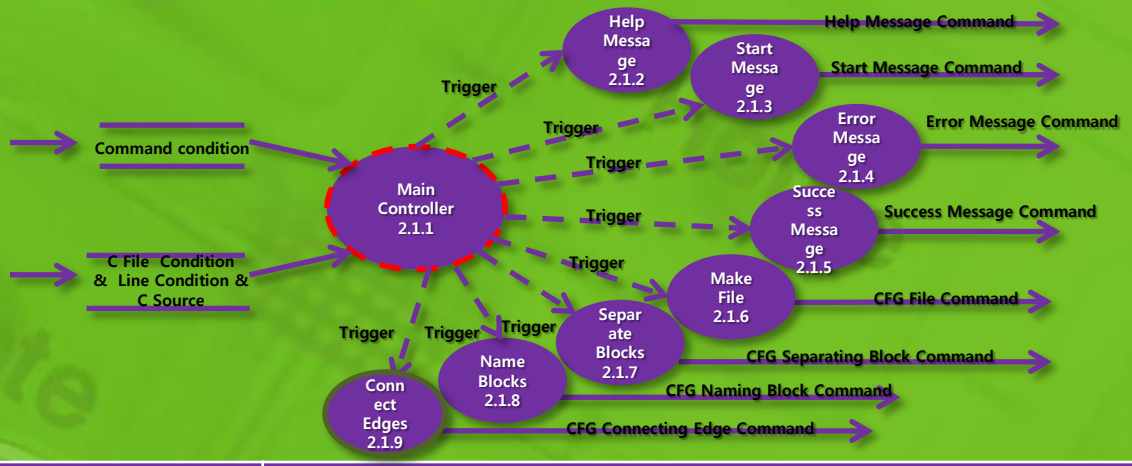
Process Specification (L2)



Reference No.	2.1
Name	CFG State Interface
Input	CFG Commands
Output	CFG CUI text file
Process Description	When it is received CFG Commands from CFG Controller, it will store and sort out and output CFG CUI text file after converting it to a type of text file.

Process Specification (L3)



Reference No.	3.1
Name	Main Controller
Input	Command condition & C File Condition & Line Condition & C Source
Output	Trigger
Process Description	After making reference to Command Condition & C File Condition & Line Condition & C Source, it would activate inner process depending on the situation and keep outer process that will be triggered and send out command under control.

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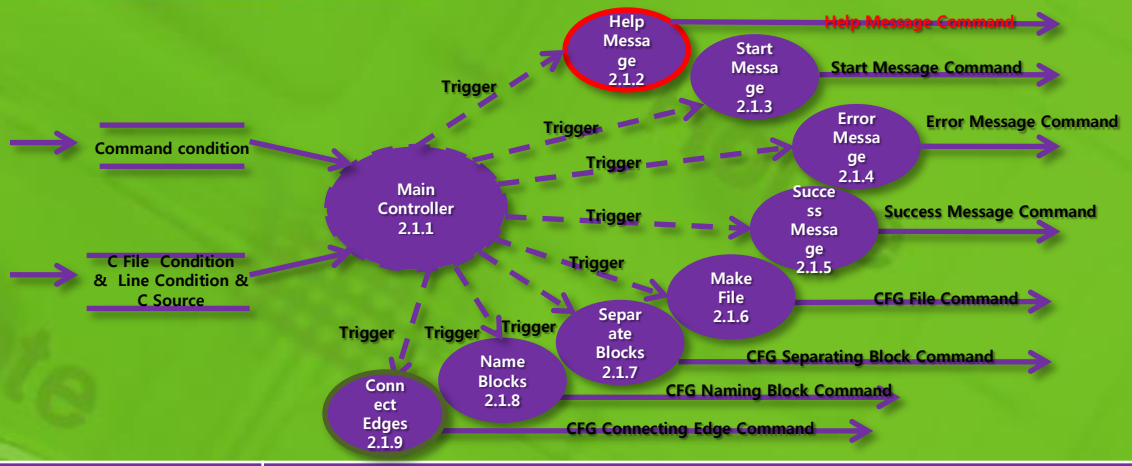
Process Specification (L3)



Reference No.	2.1.2
Name	Help Message
Input	Trigger
Output	Help Message Command
Process Description	When Help Message 2.1.2 receives trigger from Main Controller, it will output Help Message Command.

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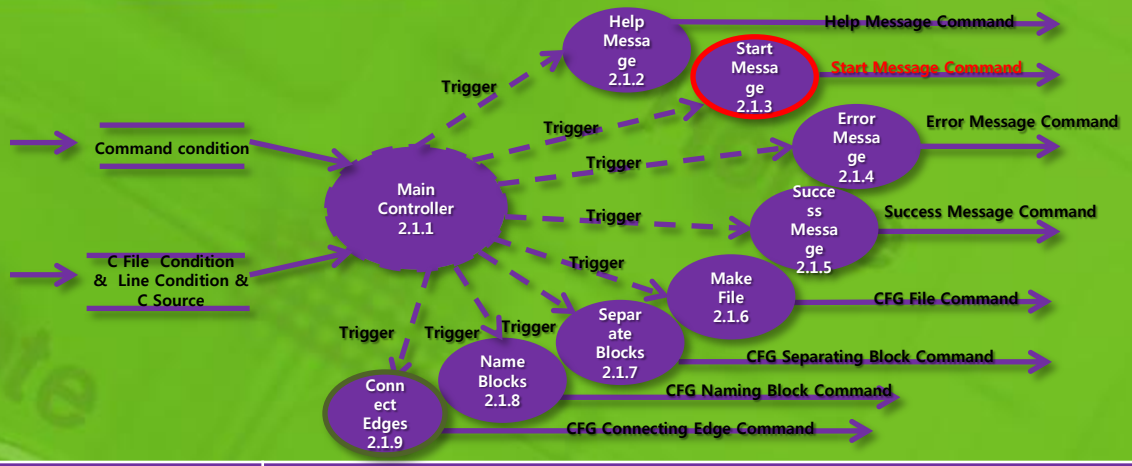
Process Specification (L3)



Reference No.	2.1.3
Name	Start Message
Input	Trigger
Output	Start Message Command
Process Description	When Start Message 2.1.3 receives trigger from Main Controller, it will output Start Message Command.

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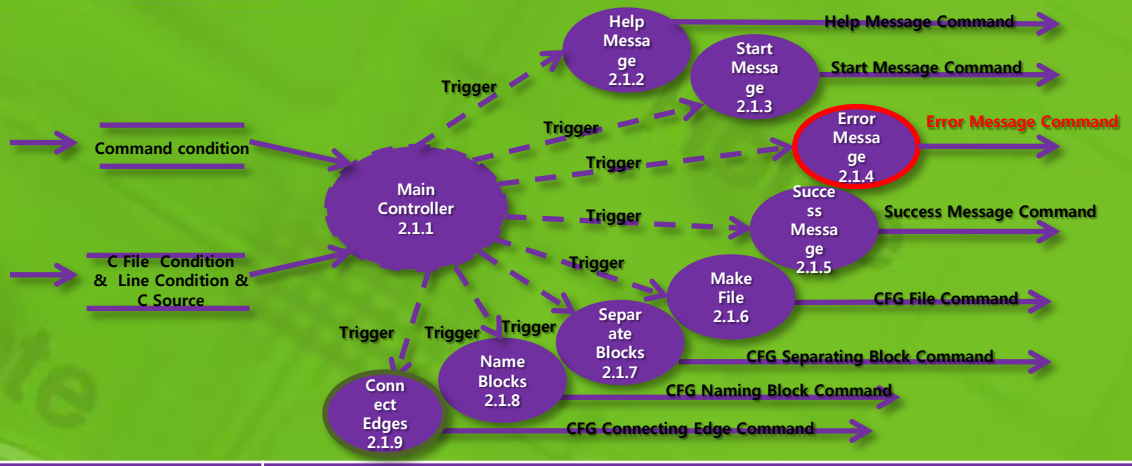
Process Specification (L3)



Reference No.	2.1.4
Name	Error Message
Input	Trigger
Output	Error Message Command
Process Description	When Error Message 2.1.4 receives trigger from Main Controller, it will output Error Message Command.

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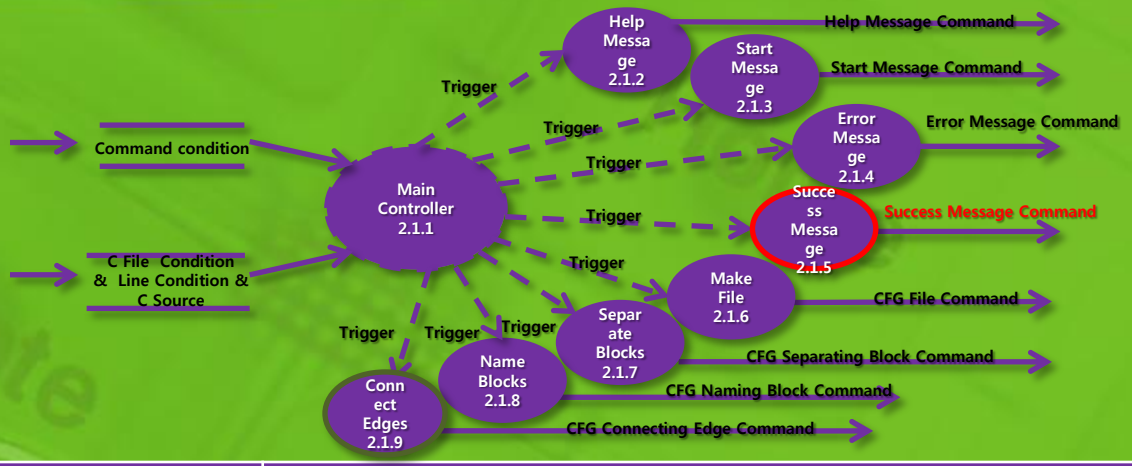
Process Specification (L3)



Reference No.	2.1.5
Name	Success Message
Input	Trigger
Output	Success Message Command
Process Description	When Success Message 2.1.5 receives trigger from Main Controller, it will output Success Message Command.

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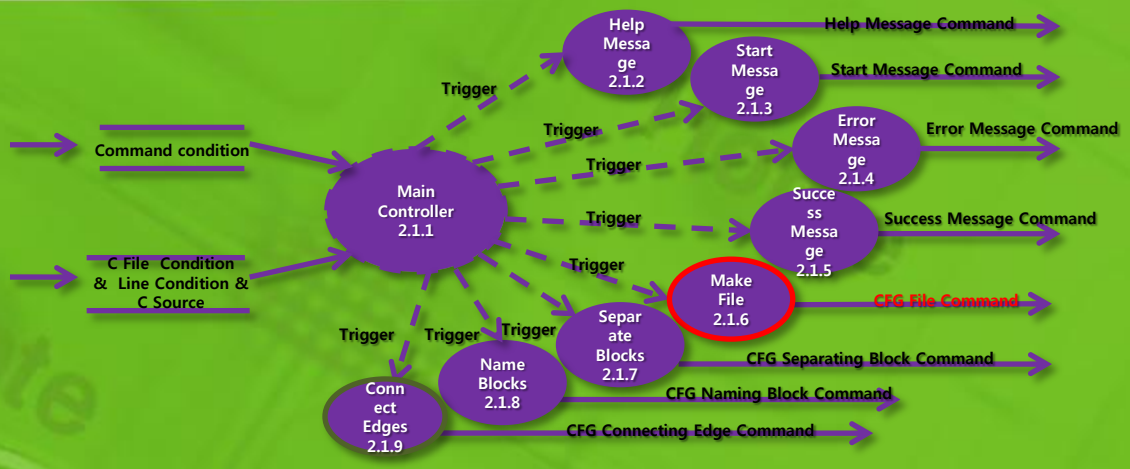
Process Specification (L3)



Reference No.	2.1.6
Name	Make File
Input	Trigger
Output	CFG File Command
Process Description	When Make File 2.1.6 receives trigger from Main Controller, it will output CFG File Command.

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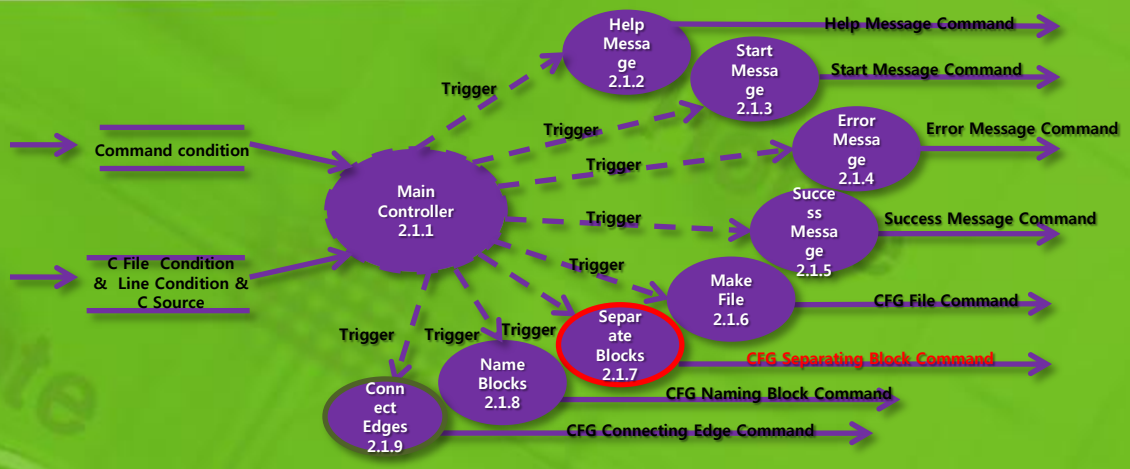
Process Specification (L3)



Reference No.	2.1.7
Name	Separate Blocks
Input	Trigger
Output	CFG Separating Block Command
Process Description	When Separate Blocks 2.1.7 receives trigger from Main Controller, it will output CFG Separating Block Command.

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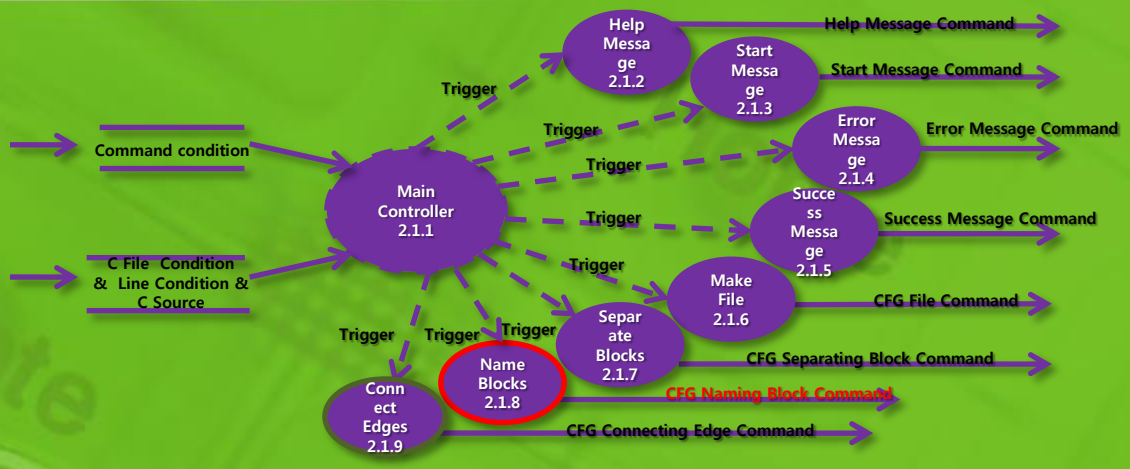
Process Specification (L3)



Reference No.	2.1.8
Name	Name Blocks
Input	Trigger
Output	CFG Naming Block Command
Process Description	When Name Blocks 2.1.8 receives trigger from Main Controller, it will output CFG Naming Block Command.

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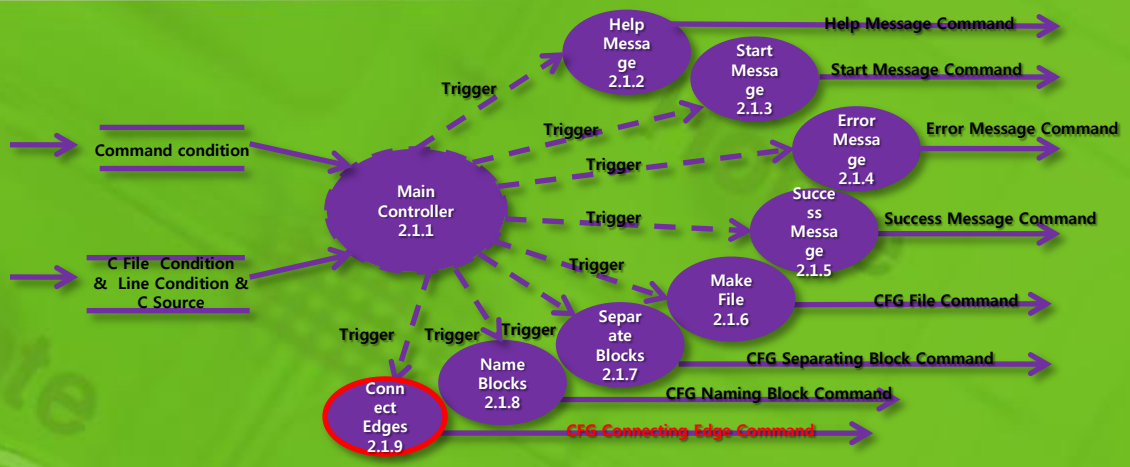
Process Specification (L3)



Reference No.	2.1.9
Name	Connect Edge Command
Input	Trigger
Output	Connecting Edge Command
Process Description	When Connect Edges 2.1.9 receives trigger from Main Controller, it will output Connecting Edge Command.

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5 Q & A

Thanks !