Test Case #1(Functional Requirement)

Test Purpose

This TC verifies the real-time CCTV person detection function of the CCTV system.

Test Precondition

- The Monitoring System is installed on the PC(also cert. key is installed)
- Security agent was log on the PC
- CCTV is operating

Test Constraints

- The number of monitoring systems simultaneously connected to CCTV is limited to one.

Test Details

	Test Step	Test Data	Expected Result
1	run the monitoring system	input: MonitoringSystem.exe	Monitoring system CCTV connection success message
2	Check if the CCTV image is normally output in the CCTV image window of the monitoring system.		CCTV video is normally output
3	Expose an authorized person to CCTV cameras in the server room.	input: authorized person	The name of the authorized person is displayed on the CCTV video
4	Expose an unauthorized person to CCTV cameras in the server room.	input: unauthorized person	In the CCTV video, unauthorized persons are marked as “unauthorized persons”.

Test Case #2(Functional Requirement)

Test Purpose

This TC verifies the recovery operation of the monitoring system when the connection between the monitoring system and CCTV is disconnected.

Test Precondition

- The Monitoring System is installed on the PC(also cert. key is installed)
- Security agent was logged on the PC and the Monitoring System is running.
- CCTV is operating.

Test Constraints

- The number of monitoring systems simultaneously connected to CCTV is limited to one.

Test Details

	Test Step	Test Data	Expected Result
1	Shut down the CCTV.		CCTV shut down
2	Check the monitoring system's attempts to reconnect the CCTV.		Output “Trying to connect(port number)” message from the monitoring system terminal
3	Restart the CCTV server.		CCTV start
4	Check the connection between the monitoring system and the CCTV.		CCTV video is normally output

Test Case #3(Quality Attribute)

Test Purpose

This TC verifies the restrictions on the use of the monitoring system by users who are not entitled to use the monitoring system (without certificates and private keys).

Test Precondition

- The Monitoring System is installed on the PC
- The certificate and private key of the monitoring system should not be installed
- attacker was log on the PC
- CCTV is operating

Test Constraints

- The number of monitoring systems simultaneously connected to CCTV is limited to one.

Related TID

- 95, 96, 115, 116, 119

Test Details

	Test Step	Test Data	Expected Result
1	Run the monitoring system	input: MonitoringSystem.exe	Start monitoring system
2	Check the certificate loading of the monitoring system.		Failed to load certificate
3	Check the termination of the monitoring system.		the monitoring system shut down

Test Case #4(Quality Attribute)

Test Purpose

This TC verifies the restrictions on the use of the monitoring system by users who are not entitled to use the monitoring system (using forged certificates and private keys).

Test Precondition

- The Monitoring System is installed on the PC
- The certificate and private key of the monitoring system different from the original must be installed
- attacker was log on the PC
- CCTV is operating

Test Constraints

- The number of monitoring systems simultaneously connected to CCTV is limited to one.

Related TID

- 95, 96, 115, 116, 119

Test Details

	Test Step	Test Data	Expected Result
1	Run the monitoring system	input: MonitoringSystem.exe	Start monitoring system
2	Check the certificate loading of the monitoring system.		Certificate loading success
3	Check the SSL authentication between the monitoring system and the CCTV.		SSL authentication failure
4	Check the termination of the monitoring system.		the monitoring system shut down

Test Case #5(Functional Requirement)

Test Purpose

This TC verifies the user add function of the user register.

Test Precondition

- The name and photo of the Authorized Person to be added are saved in the PC
- Monitoring system manager logged into CCTV via ssh
- CCTV should be run more than once

Test Constraints

Test Details

	Test Step	Test Data	Expected Result
1	Uploads a photo of the Authorized Person in the storage of the CCTV via scp.	input: a photo image	Completed copying of photo image to CCTV
2	Register the image using the user register tool.	input : a photo image and authorized person name	User register tool execution result OK
3	Start the CCTV		CCTV start OK
4	Run monitoring system and connect to CCTV.		CCTV is connected to the monitoring system.
5	Check person name is displayed when the added persion in step2 is exist in the CCTV view.		The person's name is displayed.

Test Case #6(Functional Requirement)

Test Purpose

This TC verifies the user deregistration function of the user register.

Test Precondition

- Having a list of people to exclude from authorized person
- The monitoring system manager logged into CCTV via ssh
- CCTV should be run more than once

Test Constraints

Test Details

	Test Step	Test Data	Expected Result
1	Unregister the unauthorized person from the CCTV using the user register tool.	input: unauthorized person name	User register tool execution result OK
2	Start the CCTV		CCTV start OK
3	Execute monitoring system and connect to CCTV.		CCTV connection OK
54	Expose the authorized person registered in step 2 to CCTV.		unauthorized persons are marked as “unauthorized”.

Test Case #7(Functional Requirement - SSR)

Test Purpose

This TC verifies logging of user entry/exit history in the server room.

Test Precondition

- CCTV is operating
- Monitoring system connected to CCTV
- The monitoring system manager logged into CCTV via ssh

Test Constraints

- The number of monitoring systems simultaneously connected to CCTV is limited to one.

Test Details

	Test Step	Test Data	Expected Result
1	An authorized person is exposed in front of CCTV for 1 minute.	input: authorized person	Log message ‘“Authorized Person Name” is in’
2	Remove an authorized person from CCTV.	input: authorized person	Log message ‘“Authorized Person Name” is out’
3	Expose unauthorized persons in front of CCTV for 1 minute.	input : unauthorized person	Log message “there is (1) unauthorized person”

Test Case #8(Functional Requirement - SSR)

Test Purpose

This TC verifies the logging of CCTV connection / termination history of the monitoring system.

Test Precondition

- The monitoring system manager logged into CCTV via ssh
- Security agent was log on the PC

Test Constraints

- The number of monitoring systems simultaneously connected to CCTV is limited to one.

Test Details

	Test Step	Test Data	Expected Result
1	Start the CCTV		CCTV start OK
2	Execute monitoring system and connect to CCTV.		Log message “client is connected and verified.”
3	Terminate the monitoring system.		Log message “Connection is closed.”

Test Case #9 (Quality Attribute - SSR)

Test Purpose

This TC verifies the user image encryption function of the user register.

Test Precondition

- The name and photo of the Authorized Person to be added are saved in the PC
- Monitoring system manager logged into CCTV via ssh

Test Constraints

Test Details

	Test Step	Test Data	Expected Result
1	Uploads a photo of the Authorized Person in the storage of the CCTV via scp.	input: a photo image	Completed copying of photo image to CCTV
2	Register the image using the user register tool.	input : a photo image and authorized person name	User register tool execution result successful
3	Check if an encrypted file is created in the imgs directory of the CCTV.		An image file with an encrypted file name is created
4	Open the created encrypted image file with an image viewer.	input : encrypted image file	Image file not recognized

Test Case #10 (Quality Attribute - SSR)

Test Purpose

This TC verifies the function of separating access rights of user image storage.

Test Precondition

- CCTV user image directory and encrypted image file should be created
- non-Monitoring system manager for testing logged into CCTV via ssh

Test Constraints

Test Details

	Test Step	Test Data	Expected Result
1	Moves to the directory where the photo images in the CCTV are saved. $ cd “photo image path”	input: photo image path	access denied
2	Create a file in the directory where the photo images in the CCTV are saved. $ touch “photo image path/test.exe”	input : photo image path	access denied
3	Remove the directory where the photo images in the CCTV are saved. $ rm -rf “photo image path”	input : photo image path	access denied

Test Case #11 (Quality Attribute - SSR)

Test Purpose

This TC verifies the function of separating access rights of user image storage.

Test Precondition

- CCTV user image directory and encrypted image file should be created
- Monitoring system manager logged into CCTV via ssh

Test Constraints

Test Details

	Test Step	Test Data	Expected Result
1	Moves to the directory where the photo images in the CCTV are saved. $ cd “photo image path”	input: photo image path	access denied
2	Create a file in the directory where the photo images in the CCTV are saved. $ touch “photo image path/test.exe”	input : photo image path	access denied
3	Remove the directory where the photo images in the CCTV are saved. $ rm -rf “photo image path”	input : photo image path	access denied

Test Case #12 (Quality Attribute - SSR)

Test Purpose

This TC verifies the function of separating access rights of user image storage.

Test Precondition

- CCTV user image directory and encrypted image file should be created
- CCTV account logged into CCTV via ssh

Test Constraints

Test Details

	Test Step	Test Data	Expected Result
1	Moves to the directory where the photo images in the CCTV are saved. $ cd “photo image path”	input: photo image path	change directory OK
2	Create a file in the directory where the photo images in the CCTV are saved. $ touch “photo image path/test.exe”	input : photo image path	file creation OK
3	Remove the directory where the photo images in the CCTV are saved. $ rm -rf “photo image path”	input : photo image path	file remove OK

Test Case #13 (Quality Attribute - SSR)

Test Purpose

This TC verifies the function of separating access rights to the log files of CCTV.

Test Precondition

- CCTV log directory and log files should be created
- Monitoring system manager logged into CCTV via ssh

Test Constraints

Test Details

	Test Step	Test Data	Expected Result
1	Moves to the directory where the log files in the CCTV are saved. $ cd “log file path”	input: log file path	change directory OK
2	Create a file in the directory where the log file path in the CCTV are saved. $ touch “log file path/test.log”	input : log file path	file creation failed
3	Remove the directory where the log files in the CCTV are saved. $ rm -rf “log file path”	input : log file path	file remove failed

Test Case #14 (Quality Attribute - SSR)

Test Purpose

This TC verifies the function of separating access rights to the log files of CCTV.

Test Precondition

- CCTV log directory and log files should be created
- non-Monitoring system manager logged into CCTV via ssh

Test Constraints

Test Details

	Test Step	Test Data	Expected Result
1	Moves to the directory where the log files in the CCTV are saved. $ cd “log file path”	input: log file path	access denied
2	Create a file in the directory where the log file path in the CCTV are saved. $ touch “log file path/test.log”	input : log file path	access denied
3	Remove the directory where the log files in the CCTV are saved. $ rm -rf “log file path”	input : log file path	access denied

Test Case #15 (Quality Attribute - SSR)

Test Purpose

This TC verifies the function of separating access rights to the log files of CCTV.

Test Precondition

- CCTV log directory and log files should be created
- CCTV account logged into CCTV via ssh

Test Constraints

Test Details

	Test Step	Test Data	Expected Result
1	Moves to the directory where the log files in the CCTV are saved. $ cd “log file path”	input: log file path	change directory OK
2	Create a file in the directory where the log file path in the CCTV are saved. $ touch “log file path/test.log”	input : log file path	file creation OK
3	Remove the directory where the log files in the CCTV are saved. $ rm -rf “log file path”	input : log file path	file remove OK

Test Case #16 (Quality Attribute - SSR)

Test Purpose

This TC verifies the execution authority of the user register. In this case, we just test that manager can excute Userregister tool with ACL condition.

Test Precondition

- Monitoring system manager logged into CCTV via ssh

Test Constraints

Test Details

	Test Step	Test Data	Expected Result
1	Execute User register executable $ ./UserRegister	input: User register executable	Executed successfully but usage message is printed.

Test Case #17 (Quality Attribute - SSR)

Test Purpose

This TC verifies the execution authority of the user register.

Test Precondition

- non-Monitoring system manager logged into CCTV via ssh

Test Constraints

Test Details

	Test Step	Test Data	Expected Result
1	Execute User register executable $ ./UserRegister	input: User register executable	Execution failed

Test Case #18 (Quality Attribute - SSR)

Test Purpose

This TC verifies the recovery operation of CCTV in case of abnormal termination of CCTV.

Test Precondition

- CCTV account was logged on the PC and the Monitoring System is running.
- CCTV is operating.

Test Constraints

Test Details

	Test Step	Test Data	Expected Result
1	Terminate CCTV $ kill -9 `pidof LgFaceRecDemoTCP_Jetson_NanoV2`	input: CCTV pid	CCTV termination OK
2	Check CCTV recovery $ ps aux | grep LgFaceRecDemoTCP_Jetson_NanoV2		CCTV process is running

Test Case #19 (Quality Attribute - SSR)

Test Purpose

This TC verifies that the network communication section is encrypted via tls.

Test Precondition

- CCTV is operating and the Monitoring system is not connected.
- connect to CCTV via ssh with CCTV account.

Test Constraints

Test Details

	Test Step	Test Data	Expected Result
1	Enter the command below to verify that the port communicates over SSL handshake and TLS. - openssl s_client -connect 127.0.0.1:5000	command line	Check server's certification and TLS version and protocol.