Project1:Video capture server simulation analysis

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State variables:
storage_server_busy
encoder_busy
tail_is_top

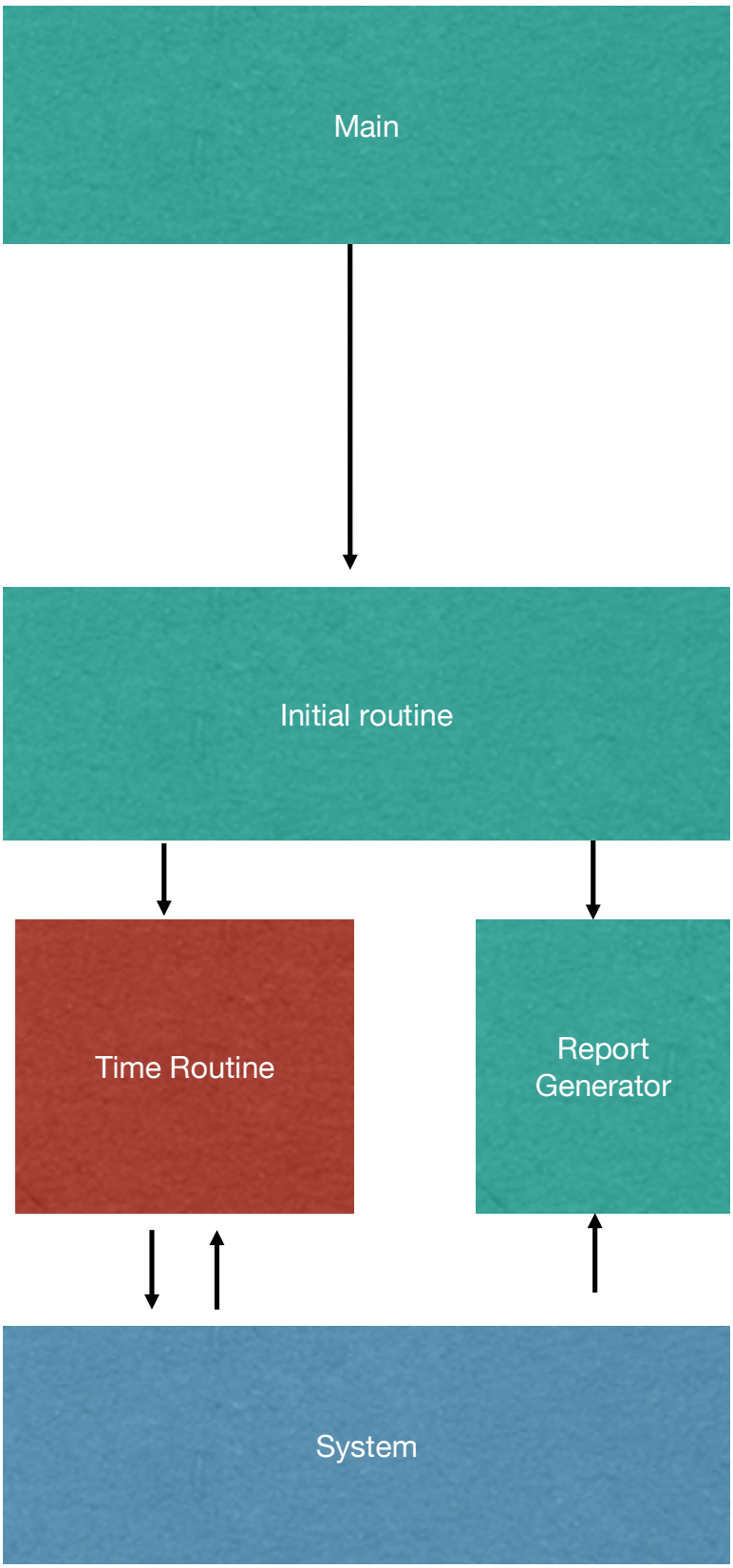
Events_list
events_list = []
three event times change the system
index = 0, new field arrives encoder
index = 1, encode finished and arrives storage server queue
index =2 , storage server process finished and field leave system

Statistical counters:
current_time
next_arrival_time
next_complexity
events_list=[]
arrived_field_count
storage_server_allProcess_time
frame_stored

Data Structure require:
events_list=[] // use the list in Python
encoder_queue=[]
storage_server_queue

Event types for the video storage system model

- Event[0], new field arrives encoder
- Event[1], encode finished/ field enter storage server queue
- Event[2], storage server finished process, and field leaves from system

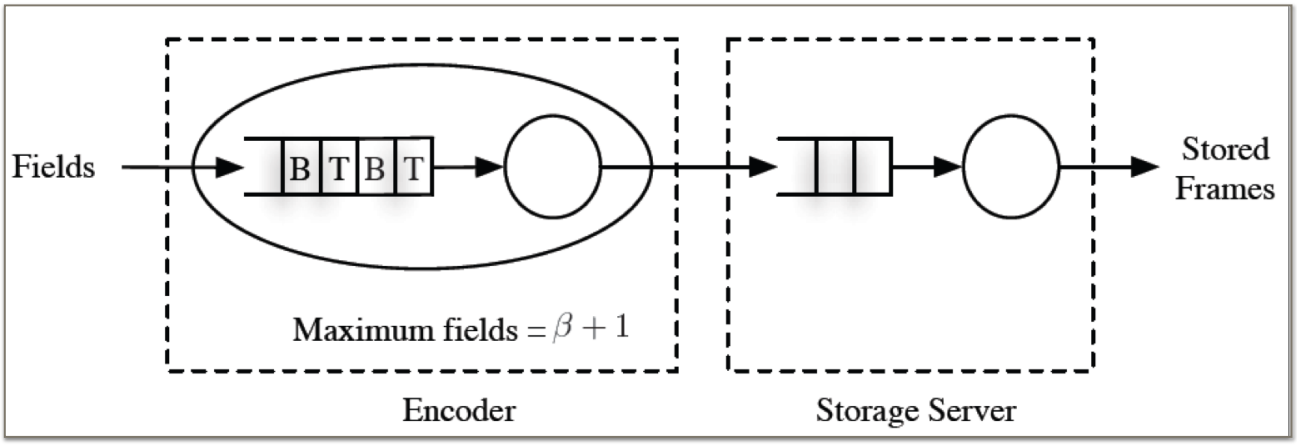


Parameter:
-field Time
-field complexity
-encoder queue length
-C_encoder
-C-storage

Method:
-create class time master
-initialize all event-
-create class report generator
-run the loop
-generate report
-schedule next event

Method:
-random generator
-schedule next field arrival time and complexity
-update event list
-schedule next event

-enter encoder queue
-encoder process
-enter storage server queue
-storage server process



Three event list

- Event 0:new field arrive to encoder, schedule next arrival and next departure
- Event 1:departure from encoder, schedule next arrival to encoder queue and new arrival to storage server queue
- Event 2:field departure of storage server queue

enter encoder queue

-check if encoder queue is empty to determine to drop field or not
- check if encoder is idle to determine to run encoder process

encoder process

-check if encoder queue is empty to determine to set encoder busy
-calculate encoder processing time and field departure time from encoder
-update event 1, encoder departure time

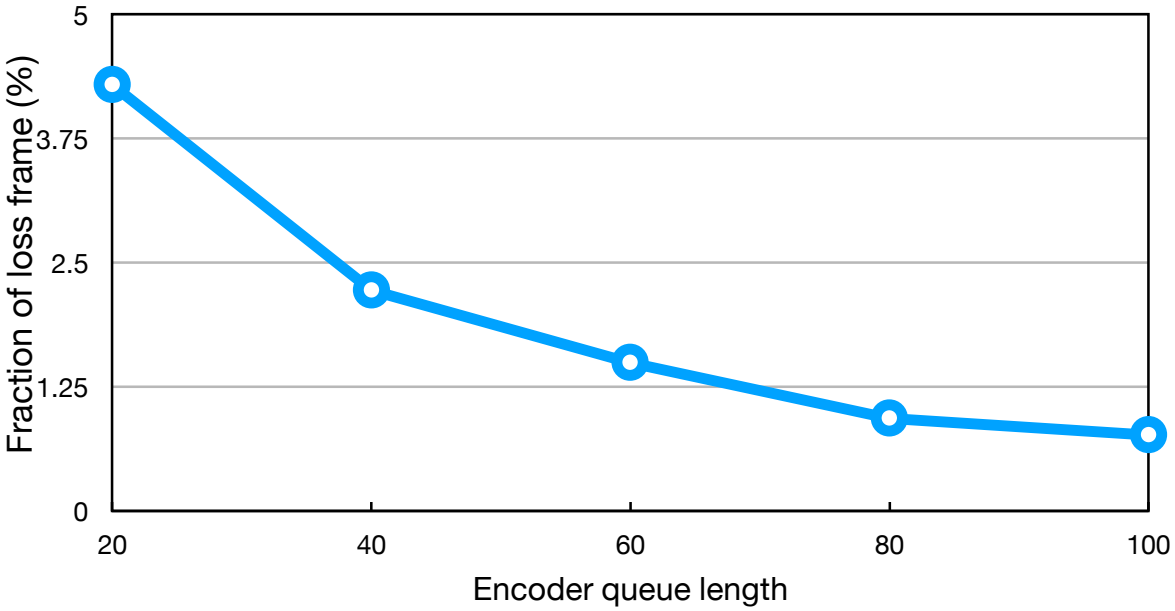
enter storage server queue

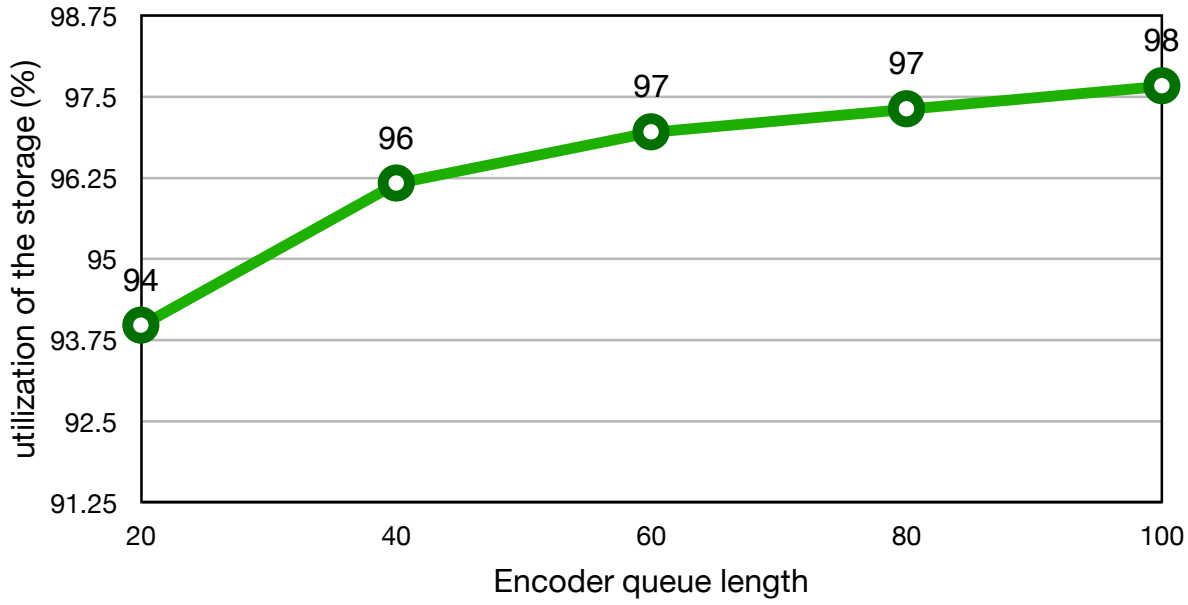
-check if encoder queue is empty to determine to set departure time infinite
- check if storage server is idle to determine to run storage server process

storage server queue

-check if server queue is empty to set server busy
-calculate encoder processing time and field departure time from encoder
-calculate storage server processing time

	20	40	60	80	100
Fraction of loss frame (%)	4.29	2.22	1.49	0.93	0.76
utilization of the storage (%)	93.97	96.16	96.95	97.31	97.66





The comparison of Python and C

- The simulation efficiency
- Extensibility
- Memory cost

Discussion:

- When field enter into storage server, the field may not move so seamlessly
- If storage server has more than one entrance, it should determine how to arrange the schedule the different encoders' queue.

Reference:

- Python Random Number Generator: the Random Module || Python Tutorial || Learn Python Programming:
- Python usage:http://stackoverflow.com/question/
- Simulation Modeling and Analysis 5th Edition