A Toolkit with Controlling Data Stream for Building Continuous Media Applications .

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February 14, 1997

Keywords: continuous media data , tool kit ,Stream Manager .

Background

Nowadays, it makes rapid progress that Information Science , Electronics , and Physics.

We can buy personal computer which have enough computing resource and environment to processing for movie and sounds . The case in point is Video Player and Video Conference software such as CU-SeeMee.

In this research , we concentrate our discussion on processing for Continuous Media Data . We study of Processing for all of Continuous Media Data such as movie data .

Continuous Media Data is continuous data under the real time. But , computer divide the data into momentary phenomenon which call samples. For instance , it is periodically observation , division and preservation that processing of incorporation continuous media data into a computer . This processing makes many data which divided under the real time in Application . So application must processing many data one after another. If stagnate a part of processing , it makes omission of data . This break waste the data .

In short , continuous media data depend on real time, and processing for Continuous media data also depend on real time. These processing is difficult for implementation. So, it need a system which help construct to Continuous Media Application.

The related works pay attention to handling continuous media data . An example is Continuous Media Server which processing continuous media data in place of application. If application want to handle continuous media data, it may only request processing media data to continuous media server. In this system, application programmer does not have to construct data handler which need real time processing. However, this system need reconstructing the server when application programmer needs new function. So, this structure does not have enough extensibility.

A new structure was proposed which Grounded on these problem. It is Continuous Media Tool kit. This system was presented for library to link with program which was wrote by application programmer. This tool kit have divided handler for continuous media data. These handler called Modules. Application programmer can make structure of media data handler with joining modules. If application programmer need new function, programmer may create a new module under the module class, and append a new module to tool kit. After all,if application programmer need new function, programmer does not need reconstruct all of tool kit such as continuous media server.

But, this structure have new problem. Continuous media data will flow between modules ,because media data handler was divided into modules. Application programmer may request handling to a server under the continuous media server. For example , application programmer's command (start , stop ,and so on...) may request to unique server. But, application programmer need select and request some modules from out of many modules, because handler was divided into many modules. So application programmer's work will larger under the continuous media tool kit than under the continuous media server.

We must propose a new structure which have enough flexibility and extensibility for handling to continuous media data .

Handling continuous media data have another problem. In computers, continuous media data consist of many samples ,because to express a continuous phenomenon.

Continuous media application must handle large data under a request for dependence with real time. So ,handling continuous media data will consume large CPU resource. If CPU resource is too short ,continuous media application will not satisfy a request for dependence with real time. Continuous media application need a mechanism of watch for CPU usage and autonomous control for reduct handling.

1 Our Goal

We examine problem for continuous media application in the above, and we propose a structure for handle continuous media data.

We consider the design of continuous media application, product tool kit for support of construction of continuous media application,and evaluate continuous media applications under the tool kit.

In this research, we use video data to give an example of continuous media data. But, we construct a tool kit for all of continuous media data.

2 Outline

VuSystem supplied structure of continuous media application,which divide up into "In-band(handle media data)" and "Out-of-band(use to In-band)". Continuous media application may construct Out-of-band,because In-band was already implemented by VuSystem.

In-band was divided to small handlers which call Modules. In-band modules consist

of three types of modules,sink module,filter module,and source module. If you must construct a large handler for complex processing, you could construct the handler by joining Modules. Still more, if you needed to new handler by new specifications, you could construct the handler by default module's template.

This system abstracts handling continuous media data from continuous media application,so this system reduce application programmer's work. However, this system does not control flow of continuous media data . It is very difficult handling plural continuous media data with inter-media synchronization under the VuSystem .

So, we propose new structure,that divided into "In-band","Stream Manager", "Out-of-band" . In-band component handles continuous media data, Out-of-band component handles user interface and so on .

Stream Manager manages the configuration of in-band modules, and provides primitives for controlling in-band modules from an out-of-band component as Module, Stream, Link, Command, Delivery, QosControl, SyncControl. Each media stream has its own stream manager for controlling the behavior stream . Stream Manager process follow employment.

- It presents objects for constructing continuous media applications .
- It presents abstraction of media data,which called Stream .
- It presents commands to control Stream .
- It support for inter-stream synchronization,dynamic QoS control.

We construct continuous media toolkit which can implement advanced stream controls as dynamic QoS(Quality of Service) control, inter-stream synchronization .

This application may watch for too match of using CPU resource, and reduce Quality of Service for purpose of avoid over load and data drop. Data drop is the worst case in continuous media applications, because data drop raise very large jitter and deteriorate data. So we must media scaling ,and reduce CPU usage for suitable processing. In this tool kit , we choice point to scaling as video frame rate which mean processing number of frame per seconds . Reducing frame rate is very effectiveness , because directly reduce the number of processing frames .

Conclusion

We consider the design of continuous media application and product toolkit . This toolkit support follow points.

- This system manages divided media data handler . We call divided handler Module .Application programmer can construct complex handler from connecting modules.
- Stream Manager abstract In-band structure. Application programmer benefit follow points by Stream Manager .

  - Stream Manager support commands for data flow .
  - Stream Manager can set policy of delivery of commands.
  - Stream Manager support calling back for autonomous controls.

- This system construct with function of real time OS for time dependent operation and system resource reservation.