SMART-system: A Japanese Innovation

IAHPSTC
V International Forum on Elite Sport
Sep 5, 2007
Beijing, China

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Why video database?

Coaches and Athletes want to ...

- **handle thousands of videos**
- **see the scene as quick as possible**
- **use videos over the Netowrk**

But no such software exist

What is SMART-system?

- Use Streaming
- Content basaed searching
- Sports oriented browsing

What is SMART-system?

- Use Streaming
  - No disk space on users PC
  - Network base
- Content basaed searching
- Sports oriented browsing

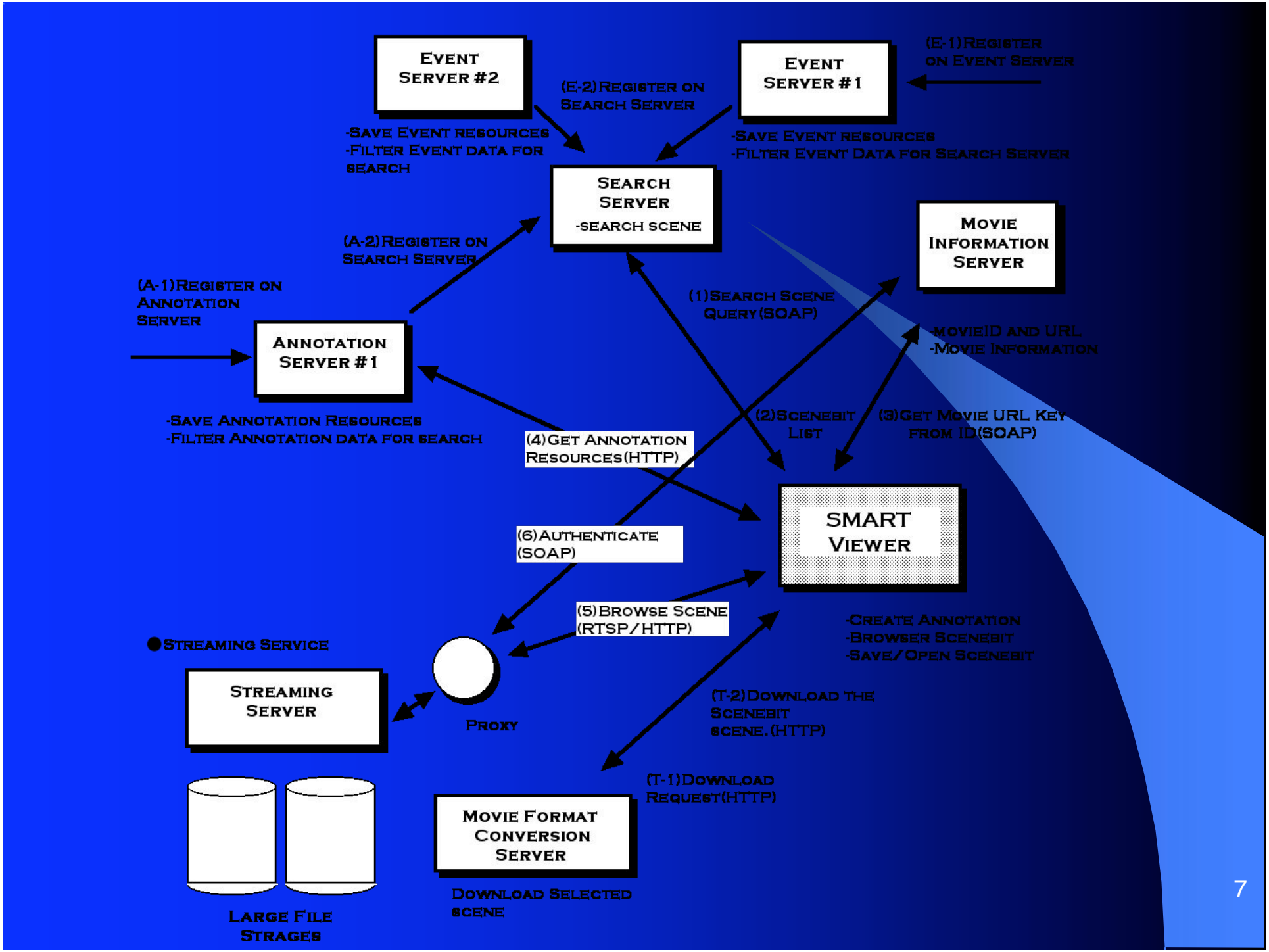
What is SMART-system?

- Use Streaming
- Content basaed searching
  - It has flexible meta-data search
  - Find scenes in videos
- Sports oriented browsing

What is SMART-system?

- Use Streaming
- Content basaed searching
- Sports oriented browsing
  - It has coaching annotation
  - It has slow motion,
  - step-by-step over streaming
  - multi windows with sync

Let's see my demonstration


EVENT SERVER #2
EVENT SERVER #1
(E-1) REGISTER ON EVENT SERVER
(E-2) REGISTER ON SEARCH SERVER
-SAVE EVENT RESOURCES
-FILTER EVENT DATA FOR SEARCH
-SAVE EVENT RESOURCES
-FILTER EVENT DATA FOR SEARCH SERVER
SEARCH SERVER
-SEARCH SCENE
MOVIE INFORMATION SERVER
(A-2) REGISTER ON SEARCH SERVER
(A-1) REGISTER ON ANNOTATION SERVER
(1) SEARCH SCENE QUERY (SOAP)
-MOVIEID AND URL
-MOVIE INFORMATION
ANNOTATION SERVER #1
-SAVE ANNOTATION RESOURCES
-FILTER ANNOTATION DATA FOR SEARCH
(2) SCENEBIT LIST
(3) GET MOVIE URL KEY FROM ID (SOAP)
(4) GET ANNOTATION RESOURCES (HTTP)
SMART VIEWER
(6) AUTHENTICATE (SOAP)
(5) BROWSE SCENE (RTSP/HTTP)
-CREATE ANNOTATION
-BROWSER SCENEBIT
-SAVE/OPEN SCENEBIT
● STREAMING SERVICE
STREAMING SERVER
PROXY
(T-2) DOWNLOAD THE SCENEBIT SCENE. (HTTP)
(T-1) DOWNLOAD REQUEST (HTTP)
MOVIE FORMAT CONVERSION SERVER
DOWNLOAD SELECTED SCENE
LARGE FILE STRAGES

Brief History of SMART-system

- 2003: Start Development
  - Examine streaming capabilities
  - Basic Design
- 2004, 2005 Development
  - Servers
  - Client soft: SMART-viewer
- 2006: Test with several sports
- 2007: Officially announced

Video Support for Synchronised Swimming

- Start 2002
  - 2002 JapanOpen (Start with a different system)
  - 2003 JapanOpen
  - 2004 JapanOpen
  - 2004 World Grand prix
  - 2005 JapanOpen (use SMART)
  - 2006 JapanOpen
  - 2006 FINA WorldCup
  - 2007 JapanOpen
- 2500 files are archived in the database now

- Supporting Aim:
  - Give quick feedback at the competition
  - Use above and under water camera

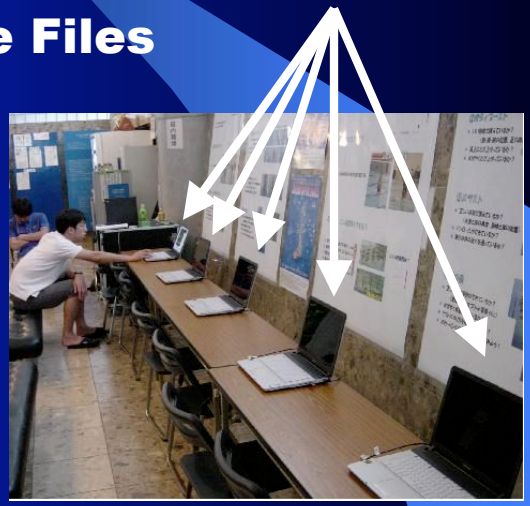
Instant Video Feedback

Capture PCs

Streaming Server

Movie Files

Underwater Camera



Feedback Place

Above water Camera

speedo

電 話
Telephone
5:5

Russian coaches use SMART-system to check their performance

Synchro Queen-Virginie Dedieu came with her choreographer

Spanish Duet check their movements just after their performance

Video Support for Judo Federation

- Archive all competitions:
  - Judo Federation takes video for all major competitions
  - Share these videos with top coaches and athletes
- Bring PCs for competition:
  - Find unknown opponent's characteristics at competition
  - Put all videos in PC instead of using network

asics
JAPAN

Now SMART is used by several sport federations

- Synchronized Swimming:
  - Instant video feedback at competitions
- Judo:
  - Archives world class competitions
  - Use SMART at competition
- Free Style Ski, Volleyball, Table Tennis:
  - Archives world Class competitions
- Figure Skate:
  - Use SMART for junior athlete selection
- Training
  - Create training movies with annotations

2007.3.31

Sports	Movie ID
Judo	1312
Synchronised Swimming	2140
Mogul	625
Volleyball	159
Aerial	43
Table Tennis	86
Training	134
Tokyo Olympic	30
Sapporo Winter Olympic	7
Total	4536

The SMART-system enables to...

- Keep personal training history
- Share videos with coaches and athletes
- Create archives for big competitions
- Create educational contents for the movements

... and more applications

Sports Movie System should support from Input to Output

Camera System

- Automatic multiple cameras
- High frame rate(100-200)
- Automatic Tagging

Archive and Search System

- TeraByte Storage
- Metadata search
- Network-based

Browsing System

- Movie with Chat
- Instant Browsing
- Analytical Browsing
- e-Training Book

What we can share with SMART-system

- Share Common Meta-data definition:
  - Definition for competitions
  - Definition for sports techniques
- Share videos:
  - Create archives for world class competitions
  - Share regional competition's videos
- SMART is an open system:
  - add optional software

Best Software for athletes

Thank you for your attention