

# Creating Enriched YouTube Media Fragments With NERD Using Timed-Text

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## Introduction

New W3C standards, such as HTML5, Media Fragment URI, the Ontology for Media Resources, have made video a first class citizen on the Web. However, indexing video at a fine grained level is not yet a common practice. Our contributions:

- Using NERD for extracting named entities from timed-text
- Using named entities to annotate and enrich media fragments with pointers to the LOD cloud.
- A user interface for browsing the enriched YouTube videos

We provide a lightweight evaluation to show that:

- Subtitles can be successfully retrieved from YouTube and named entity extractions can be run
- Videos exhibit a very different behaviour in terms of dominant types of named entities depending on their genre

## Architecture

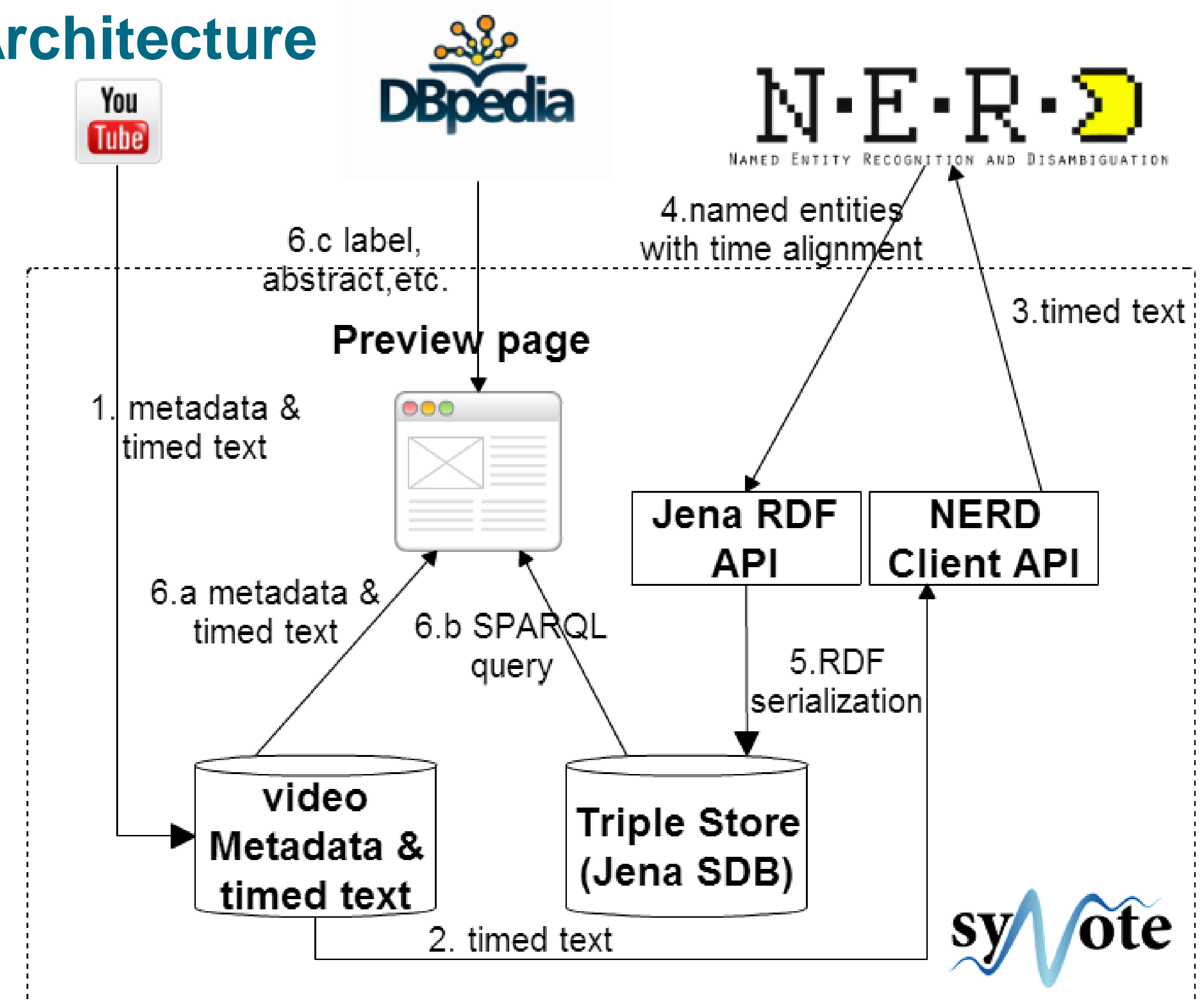


Figure 1. Synote and NERD integration architecture

## Screenshot

URI pointing to a fragment of the video using the Media Fragment URI Syntax

Video will start playing from 3:09 and stop at 3:13

Video and subtitle retrieved from YouTube

Named entities are highlighted in different colors according to their categories

The screenshot shows a web browser displaying a video player and a sidebar with NERD results. The video player shows a video of President Obama speaking. The subtitle below the video reads: "And so shortly after taking office, I directed Leon Panetta, the director of the CIA, to make the killing or capture of bin Laden the top priority of our war against al Qaeda." The NERD results on the right show 8 top-level categories: Thing (8 entities), Person (7 entities), Organization (8 entities), and Location (13 entities). A callout points to the "Leon Panetta" entity, stating: "Disambiguation information retrieved from DBpedia via SPARQL query". Another callout points to the "Leon Panetta" entity in the subtitle, stating: "Clicking on a named entity, the video seeks to the media fragment that corresponds to the subtitle block where the named entity has been extracted." A third callout points to the top of the NERD results, stating: "8 top level NERD categories".

Figure 2. Screenshot of the demo

## Extraction Workflow Explained

- ❑ Two requests to extract subtitles from YouTube
  - `Get api/timedtext?v=videoid&type=list`
  - `Get api/timedtext?v=videoid&lang=en&format=srt&name=track`
- ❑ Sending timed text to NERD in SRT format
- ❑ NERD returns a list of named entities including:
  - LD URIs identifying named entities and NERD types
  - Temporal references *startNPT* and *endNPT*
- ❑ Serialize media fragments, named entities and annotations into RDF using the NERD Ontology, Ontology for Media Resources, Open Annotation Ontology and String Ontology available in NIF
- ❑ Named entities preview with videos and subtitles
  - Synote Jena SDB: media fragment, named entities, temporal alignment
  - Synote Relational Database: metadata, timed text
  - DBpedia: abstract, depiction, label, etc.

## Evaluation

	People & Blogs	Sports	Science & Technology
Thing	6.68	15.35	14.75
Person	4.42	9.75	14.55
Function	0.74	7.35	1.15
Organisation	3.63	9.20	12.25
Location	3.89	8.05	6.40
Product	3.26	2.60	6.40
Time	3.95	13.80	3.35
Amount	5.47	9.30	6.30
Event	0.05	0.00	0.00

Table 1. Average number of entities for the 8 NERD top categories grouped by video channels

We chose 60 videos from 3 different channels

- Sci & Tech has more *People* and *Organizations*
- Sports mention more often *Locations*
- People & Blog has much less useful information ... but could be used to train event detection

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