Cross-Platform Circulation Design of Manuscripts in Converged Media Environments (Post-Print)

Authors: Hou Changjiang

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Abstract

Against the backdrop of convergence between traditional and emerging media, this paper takes the China News Service multimedia editing platform and the China News Network multimedia editing platform as research objects, and designs and implements a cross-platform manuscript circulation function between the two platforms. First, it introduces the front-end and back-end interaction technology SpringMVC, the national standard for news manuscripts CNML, and the HttpURLConnection utility class based on the HTTP protocol; second, it designs and implements a cross-platform manuscript data flow and elaborates on some implementation details; finally, it analyzes the advantages and disadvantages of this circulation method.

Full Text

Design of Cross-Platform Content Flow in a Converged Media Environment

Abstract: Against the backdrop of converging traditional and emerging media, this paper examines the CNS multimedia editing platform and China News Network multimedia editing platform as case studies to design and implement cross-platform content flow functionality. It first introduces the SpringMVC front-end/back-end interaction technology, the CNML national standard for news articles, and the HttpURLConnection utility class based on the HTTP protocol. Next, it designs and implements a cross-platform data flow process for news content, elaborating on key implementation details. Finally, it analyzes the advantages and disadvantages of this flow method.

Keywords: Cross-platform; CNML; Data flow; Process design

Introduction

Media convergence represents a new operational model under the broader integration of international media organizations. As traditional and emerging media continuously interact and merge through practice and exploration, achieving data flow between media platforms and ultimately realizing integrated development has become an inevitable trend. China News Service (CNS) is a national-level news agency whose editorial platform (hereinafter referred to as "CNS-Edit") provides a complete system for internal staff to write, edit, and approve news content. It distributes three major news product lines—text dispatches, text features, and photo dispatches—under the CNS byline, forming a user network covering most overseas Chinese-language media.

China News Network, sponsored by China News Service, is a prominent Chinese-language news portal that now provides emerging media content services including text, images, video, Weibo, and WeChat through its editorial platform (hereinafter referred to as "Network-Edit"). Prior to integration, CNS-Edit and Network-Edit operated as isolated cross-platform systems—content created on one platform could not be edited on the other. This not only inconvenienced newsroom staff but also resulted in wasted content resources. With the arrival of the all-media era, integrating these platforms to achieve data flow between traditional and emerging media has become necessary to advance media technology convergence. This paper uses the example of journalists creating web content on the CNS-Edit platform to study and present a cross-platform content data flow method.

Technical Foundation

SpringMVC Framework

SpringMVC is a web framework based on the MVC architecture that provides robust functionality for building stable web applications. Its support for annotation-based configuration has significantly improved usability, and the framework is now well-established in the market. SpringMVC uses a DispatcherServlet class to distribute incoming HTTP requests to backend processes and returns processed results to users through a view resolver. The parsing process is illustrated in Figure 1 [Figure 1: see original paper]. The CNS editorial platform adopts a J2EE architecture, with SpringMVC handling front-end/back-end interaction functionality.

CNML Format

"Chinese News Markup Language" (CNML) is a national standard for news content that employs XML syntax to transmit article data through nodes and attribute values, similar to XML. It is currently used by domestic news agencies, newspapers, news websites, television stations, radio stations, and media application software. CNML can encapsulate content, metadata, relationships

between content elements, and correspondences between articles and attachments into a single package, though the specific elements to be encapsulated depend on business requirements and public exchange needs.

Sample CNML format content is shown in Table 1 . For cross-platform content transfer, both platforms must agree on transmission specifications. The CNML format, as a mature national standard widely adopted in the journalism field, is used for article entity transmission between the CNS editorial platform and Network-Edit. Specifically, CNS-Edit assembles content to be transferred into CNML format, which Network-Edit then parses and saves to its database upon receipt.

HttpURLConnection Utility

The CNS-Edit and Network-Edit platforms implement data flow input/output interactions through the HTTP protocol. We selected the native JDK class HttpURLConnection, which provides a series of HTTP protocol-based methods for sending GET or POST requests to designated websites and receiving response results as streams.

Cross-Platform Submission Workflow Design and Implementation

CNS-Edit and Network-Edit conduct data flow through an intermediate interface layer. Using the example of submitting content from CNS-Edit to Network-Edit, the data flow design is illustrated in Figure 2 [Figure 2: see original paper]. The detailed workflow is as follows:

1. After a journalist writes web content on CNS-Edit and the duty editor conducts preliminary review, the article metadata and content are stored in the content database. Utilities process uploaded images and videos (e.g., adjusting resolution) and store them in a designated CNS-Edit directory with attachment IDs marked.

2. Upon duty editor approval, the CNS-Edit submission system stores the approved version in the content database, reads the Network-Edit interface link saved in the Oracle database, and sends the article ID information of the duty editor' s final approved version to the Network-Edit interface.

3. After receiving the article ID, Network-Edit queries its content database to determine whether the article already exists. If not, Network-Edit passes valid download account credentials, password, and the article ID as parameters to call the download interface provided by CNS-Edit to retrieve article information and attachments. Network-Edit remains in a listening state until an HTTP protocol data packet is returned.

4. The CNS-Edit interface retrieves relevant article data from the database and designated directory, then uses the DOM4J tool to assemble metadata

into a standard CNML format file (generated in memory without saving to disk). CNML article naming convention: `type_{articleID}.XML`. Attachments (images, videos, etc.) are separate files described in the CNML file. The CNS-Edit interface packages the CNML article and corresponding attachments into a ZIP archive, converts the compressed file into a byte stream, and returns it to the Network-Edit listening interface. If CNS-Edit cannot locate the specified article or encounters packaging errors, it generates an `ERROR.XML` file and includes it in the ZIP package. The `ERROR.XML` file describes specific error messages through a Message node. Attachment naming convention: `type_{{{articleID}}_{{attachmentID}}}.extension`. For example, for a Weibo article (type ID 2) with article ID 64536 containing two images, the naming would be: CNML file: `2_{64536}1.XML`; Image attachment 1: `2_{{{64536}}_{{001}}}.jpg`.

5. Upon receiving the ZIP stream file, the Network-Edit interface ends its listening state, decompresses the ZIP archive, converts the CNML article back into a content entity, saves it to the appropriate Network-Edit database according to type, and stores corresponding attachments in the designated Network-Edit location. If the ZIP package contains an `ERROR.XML` file, it indicates article download failure, and error information is returned to the submission page.

6. After successful Network-Edit database insertion, the system calls the callback interface provided by CNS-Edit (required format shown in Table 2) and writes a synchronization log. Upon receiving the XML stream information, CNS-Edit updates the article status in its database to "entered Network-Edit database."

7. Network-Edit editors retrieve the article from their platform for subsequent processing.

Analysis and Future Work

This paper implements a cross-platform data flow function using the example of creating web content on the CNS editorial platform and sending it to the China News Network platform for review, providing a technical means for platform integration. Currently, over one hundred news articles daily flow between CNS-Edit and Network-Edit through this method. Practical testing demonstrates that this approach is efficient and relatively reliable. However, the synchronous transmission method wastes network resources and demands stable network conditions. Future work will consider using message-oriented middleware products to achieve asynchronous transmission of articles and attachments, thereby avoiding request loss caused by network instability.

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Author Affiliation: Technology Department, China News Service

Note: Figure translations are in progress. See original paper for figures.