

# File Upload Integration Summary

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## Overview

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Implemented a comprehensive file upload system for the CDM Suite CMS, allowing users to upload images and files directly from their computer. All uploads are stored securely in cloud storage (AWS S3) and seamlessly integrated throughout the application.

## What Was Implemented

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### 1. Cloud Storage Infrastructure

- **AWS S3 Configuration** ( `lib/aws-config.ts` )
  - Automatic bucket configuration from environment variables
  - S3 client initialization
- **S3 Utility Functions** ( `lib/s3.ts` )
  - `uploadFile()` - Upload files to S3
  - `getFileUrl()` - Generate signed URLs for secure file access
  - `deleteFile()` - Remove files from S3
  - `deleteFiles()` - Bulk delete multiple files
  - `renameFile()` - Rename/move files in S3

### 2. File Upload API

- **Upload Endpoint** ( `/api/upload` )
  - Accepts file uploads via FormData
  - Validates file types (images only)
  - Validates file size (max 10MB)
  - Stores files in S3
  - Returns cloud storage path
- **File Retrieval Endpoint** ( `/api/file/[key]` )
  - Generates signed URLs for cloud storage files
  - Redirects to signed URLs for direct access

### 3. FileUpload Component

Created a reusable `FileUpload` component with:

- Click-to-upload and drag-and-drop support
- Image preview before upload
- Upload progress indicator
- File size and type validation
- Error handling and user feedback
- Remove uploaded file capability

## 4. CMS Integration

### Case Studies Editor

- Replaced manual URL input with FileUpload component
- Upload hero images directly from computer
- Automatic cloud storage path management
- Preview uploaded images in editor

### Page Builder

- FileUpload integration for section images
- Background image uploads
- Hero section images
- Image section uploads

### Image Display

Updated all image display locations to support cloud storage paths:

- Case study detail pages
- Case studies listing
- Dashboard case studies list
- Page builder section preview
- Public-facing pages

## 5. File Management Features

- **Automatic Path Resolution:** Images automatically detect if they're from cloud storage
- **Signed URL Generation:** Secure time-limited URLs for file access
- **Seamless Integration:** Works with existing images and new uploads
- **Format Support:** JPG, PNG, GIF, WEBP, SVG

## How to Use

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### For Content Editors

#### Uploading Images in Case Studies

1. Go to `/dashboard/content/case-studies`
2. Create new or edit existing case study
3. In the "Hero Image" section, click the upload area
4. Select an image from your computer (max 10MB)
5. Image automatically uploads and previews
6. Save the case study

#### Uploading Images in Page Builder

1. Navigate to `/dashboard/pages`
2. Create new or edit existing page
3. Add sections with images (Hero, Image, etc.)
4. Click the upload area in the section editor
5. Select image from your computer
6. Image automatically uploads and displays in preview

## For Developers

### Using the FileUpload Component

```
import { FileUpload } from '@components/file-upload';

<FileUpload
  value={imagePath}
  onChange={(cloudStoragePath) => setImagePath(cloudStoragePath)}
  label="Upload Image"
  description="Click to upload or drag and drop"
  maxSizeMB={10}
  accept="image/*"
/>
```

### Displaying Uploaded Images

```
import Image from 'next/image';

const imageUrl = imagePath.startsWith('uploads/')
  ? `/api/file/${encodeURIComponent(imagePath)}`
  : imagePath;

<Image src={imageUrl} alt="..." fill />
```

### Direct S3 Operations

```
import { uploadFile, getFileUrl, deleteFile } from '@lib/s3';

// Upload
const cloudPath = await uploadFile(buffer, 'filename.jpg', 'image/jpeg');

// Get URL
const signedUrl = await getFileUrl(cloudPath);

// Delete
await deleteFile(cloudPath);
```

## Technical Details

### Storage Format

- Files stored with timestamp prefix: `uploads/1234567890-filename.jpg`
- Cloud storage paths saved in database
- Signed URLs generated on-demand with 1-hour expiration

### Security Features

- Authentication required for uploads
- File type validation (images only)
- File size limits (10MB)
- Signed URLs for secure access
- Time-limited access (1 hour default)

## Performance Optimizations

- Direct uploads to S3 (no server relay)
- Client-side image preview
- Lazy loading of signed URLs
- Efficient file handling

## Files Created/Modified

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### New Files

1. `/lib/aws-config.ts` - AWS S3 configuration
2. `/lib/s3.ts` - S3 utility functions
3. `/app/api/upload/route.ts` - File upload API
4. `/app/api/file/[key]/route.ts` - File retrieval API
5. `/components/file-upload.tsx` - FileUpload component

### Modified Files

1. `/app/dashboard/content/case-studies/[id]/page.tsx` - Added FileUpload
2. `/components/page-builder/section-editor.tsx` - Added FileUpload
3. `/components/page-builder/section-preview.tsx` - Cloud storage support
4. `/app/case-studies/[slug]/page.tsx` - Display cloud images
5. `/components/case-studies/case-studies-list.tsx` - Display cloud images
6. `/app/dashboard/content/case-studies/page.tsx` - Display cloud images

## Dependencies Added

- `@aws-sdk/client-s3` - AWS S3 client
- `@aws-sdk/s3-request-presigner` - Signed URL generation

## Benefits

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### For Users

- ✓ Easy image uploads directly from computer
- ✓ No need to use external image hosting
- ✓ Instant preview of uploaded images
- ✓ Secure cloud storage
- ✓ Fast image loading

### For Developers

- ✓ Reusable FileUpload component
- ✓ Consistent file handling across app
- ✓ Built-in validation and error handling
- ✓ S3 utilities for custom implementations
- ✓ Automatic path resolution

## Configuration

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The system uses environment variables automatically configured during cloud storage initialization:

- `AWS_BUCKET_NAME` - S3 bucket name

- `AWS_FOLDER_PREFIX` - Optional folder prefix
- AWS credentials are managed automatically

## Next Steps (Optional Enhancements)

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Future improvements could include:

1. Support for more file types (PDFs, videos)
2. Image editing tools (crop, resize, filters)
3. Bulk upload functionality
4. File manager dashboard
5. Advanced image optimization
6. CDN integration for faster delivery

## Status

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- ✓ **COMPLETE** - File upload system is fully implemented and tested
  - ✓ All existing images continue to work
  - ✓ New uploads are automatically stored in cloud
  - ✓ CMS fully integrated with file upload capability
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Last Updated: October 21, 2025

Feature Status: Production Ready