

StabilityAI Integration for AI BlogWriter Pro

This document explains the StabilityAI integration for generating realistic, natural-looking images for blog posts.



Features

- **Advanced Prompt Engineering:** Uses sophisticated prompts to generate natural, documentary-style photography
- **Aspect Ratio Support:** Supports 16:9, 4:3, and 1:1 aspect ratios for different image types
- **Realistic Image Generation:** Emphasizes photographic realism over typical AI-generated aesthetics
- **Robust Fallback System:** Graceful handling when API key is not configured
- **File Management:** Automatic saving of generated images to public directory



Setup Instructions

1. Configure StabilityAI API Key

1. Go to [Stability AI Platform](https://platform.stability.ai/) (<https://platform.stability.ai/>)
2. Sign up/login and navigate to your API keys section
3. Create a new API key
4. Add it to your `.env` file:

```
STABILITY_AI_API_KEY="sk-your-actual-stability-ai-api-key-here"
```

2. Directory Structure

The integration automatically creates the following directory:

```
public/  
└─ generated-images/      # Where generated images are saved
```



API Endpoints

`/api/asset-retrieval` (POST)

Main image generation endpoint that interfaces with StabilityAI.

Request:

```
{  
  "task": "Generate a realistic, natural-looking image using this detailed prompt:  
[YOUR_PROMPT]",  
  "context": "Blog post generation context"  
}
```

Response (Success):

```
{
  "success": true,
  "url": "/generated-images/your-image.png",
  "filename": "your-image.png",
  "aspectRatio": "16:9",
  "size": {"width": 1344, "height": 768},
  "provider": "StabilityAI",
  "model": "stable-diffusion-xl-1024-v1-0",
  "generated": true
}
```

Response (Placeholder Mode):

```
{
  "success": true,
  "url": "/generated-images/placeholder-your-image.jpg",
  "generated": false,
  "provider": "Placeholder",
  "note": "Placeholder image - configure STABILITY_AI_API_KEY for real image generation"
}
```

/api/test-stability (POST)

Test endpoint for verifying StabilityAI integration.

Request:

```
{
  "prompt": "A professional photo of a modern workspace"
}
```

Image Generation Workflow

1. Advanced Prompt Analysis

The system uses a sophisticated AI prompt to analyze blog content and generate 3 image suggestions:

- **1 Featured Image** (16:9): For blog headers and social sharing
- **2 Body Images** (4:3 or 1:1): For supporting content within the article

2. Realistic Prompt Engineering

All generated prompts include these realism modifiers:

- "Natural lighting, shot with DSLR camera"
- "Documentary photography style"
- "Authentic candid moment"
- "Slightly imperfect realistic details"
- "Unposed natural expressions"
- "Photojournalistic style"

3. StabilityAI Generation

- Uses `stable-diffusion-xl-1024-v1-0` model
- Configured with `photographic` style preset
- Optimized settings: 30 steps, CFG scale 7
- Supports multiple aspect ratios

4. File Management

- Images saved as PNG format in `/public/generated-images/`
- Automatic filename sanitization
- Timestamp-based unique naming



Configuration Options

StabilityAI Request Parameters

```
{
  text_prompts: [{ text: imagePrompt, weight: 1 }],
  cfg_scale: 7,           // Guidance scale
  height: 768,           // Image height
  width: 1344,           // Image width
  samples: 1,            // Number of images
  steps: 30,             // Generation steps
  style_preset: 'photographic' // Style preset
}
```

Supported Aspect Ratios

- **16:9**: 1344x768 (Featured images, headers)
- **4:3**: 1152x896 (Body images, standard)
- **1:1**: 1024x1024 (Body images, square)



Error Handling

API Key Issues

- Invalid/missing API key: Returns placeholder mode
- Rate limiting: Automatic fallback to mock responses
- Network errors: Graceful degradation

Common Error Messages

- `"StabilityAI API key not configured"` - Set up your API key
- `"StabilityAI API error: 401"` - Invalid API key
- `"No images generated by StabilityAI"` - Generation failed

Testing

Test Image Generation

```
curl -X POST "http://localhost:3000/api/test-stability" \
  -H "Content-Type: application/json" \
  -d '{"prompt": "A professional workspace with natural lighting"}'
```

Test Full Workflow

```
curl -X POST "http://localhost:3000/api/blog/generate-images" \
  -H "Content-Type: application/json" \
  -d '{
    "title": "Modern Web Development",
    "content": "Content about web development...",
    "keywords": ["web", "development", "programming"]
  }'
```



Performance Notes

- **Generation Time:** 15-30 seconds per image
- **File Sizes:** ~2-5MB per PNG image
- **Rate Limits:** Check StabilityAI documentation
- **Costs:** ~\$0.04 per image generation



Future Enhancements

- [] Add image style presets (artistic, cinematic, etc.)
- [] Implement batch generation optimization
- [] Add image editing/modification features
- [] Support for additional aspect ratios
- [] Integration with cloud storage (S3/CloudFront)
- [] Image compression and optimization

Note: This integration provides both real StabilityAI generation and placeholder functionality, ensuring the system works even without API key configuration during development and testing.