Prompt caching

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Reduce latency and cost with prompt caching.

Model prompts often contain repetitive content, like system prompts and common instructions. OpenAI routes API requests to servers that recently processed the same prompt, making it cheaper and faster than processing a prompt from scratch. This can reduce latency by up to 80% and cost by 50% for long prompts. Prompt Caching works automatically on all your API requests (no code changes required) and has no additional fees associated with it.

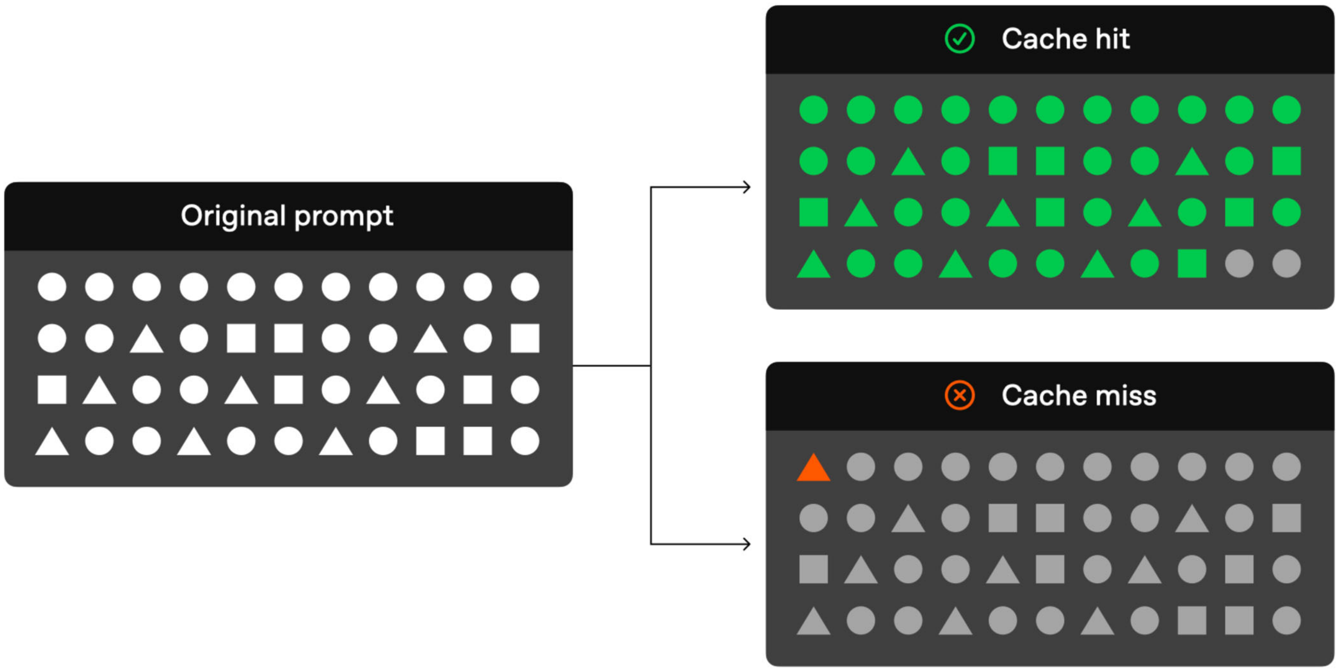
Prompt Caching is enabled for the following models:

MODEL	TEXT INPUT COST	AUDIO INPUT COST
gpt-4o (excludes gpt-4o-2024-05-13 and chatgpt-4o-latest)	50% less	n/a
gpt-4o-mini	50% less	n/a
gpt-4o-realtime-preview	50% less	80% less
o1-preview	50% less	n/a
o1-mini	50% less	n/a

This guide describes how prompt caching works in detail, so that you can optimize your prompts for lower latency and cost.

Structuring prompts

Cache hits are only possible for exact prefix matches within a prompt. To realize caching benefits, place static content like instructions and examples at the beginning of your prompt, and put variable content, such as user-specific information, at the end. This also applies to images and tools, which must be identical between requests.



How it works

Caching is enabled automatically for prompts that are 1024 tokens or longer. When you make an API request, the following steps occur:

1. **Cache Lookup**: The system checks if the initial portion (prefix) of your prompt is stored in the cache.
2. **Cache Hit**: If a matching prefix is found, the system uses the cached result. This significantly decreases latency and reduces costs.
3. **Cache Miss**: If no matching prefix is found, the system processes your full prompt. After processing, the prefix of your prompt is cached for future requests.

Cached prefixes generally remain active for 5 to 10 minutes of inactivity. However, during off-peak periods, caches may persist for up to one hour.

Requirements

Caching is available for prompts containing 1024 tokens or more, with cache hits occurring in increments of 128 tokens. Therefore, the number of cached tokens in a request will always fall within the following sequence: 1024, 1152, 1280, 1408, and so on, depending on the prompt's length.

All requests, including those with fewer than 1024 tokens, will display a `cached_tokens` field of the `usage.prompt_tokens_details` chat completions object indicating how many of the prompt tokens were a cache hit. For requests under 1024 tokens, `cached_tokens` will be zero.

```
"usage": {
  "prompt_tokens": 2006,
  "completion_tokens": 300,
  "total_tokens": 2306,
  "prompt_tokens_details": {
    "cached_tokens": 1920
  },
  "completion_tokens_details": {
    "reasoning_tokens": 0,
    "accepted_prediction_tokens": 0,
    "rejected_prediction_tokens": 0
  }
}
```

What can be cached

Messages: The complete messages array, encompassing system, user, and assistant interactions.

Images: Images included in user messages, either as links or as base64-encoded data, as well as multiple images can be sent. Ensure the detail parameter is set identically, as it impacts image tokenization.

Tool use: Both the messages array and the list of available `tools` can be cached, contributing to the minimum 1024 token requirement.

Structured outputs: The structured output schema serves as a prefix to the system message and can be cached.

Best practices

Structure prompts with static or repeated content at the beginning and dynamic content at the end.

Monitor metrics such as cache hit rates, latency, and the percentage of tokens cached to optimize your prompt and caching strategy.

To increase cache hits, use longer prompts and make API requests during off-peak hours, as cache evictions are more frequent during peak times.

Prompts that haven't been used recently are automatically removed from the cache. To minimize evictions, maintain a consistent stream of requests with the same prompt prefix.

Frequently asked questions

1. **How is data privacy maintained for caches?**

   Prompt caches are not shared between organizations. Only members of the same organization can access caches of identical prompts.

2. **Does Prompt Caching affect output token generation or the final response of the API?**

   Prompt Caching does not influence the generation of output tokens or the final response provided by the API. Regardless of whether caching is used, the output generated will be identical. This is because only the prompt itself is cached, while the actual response is computed anew each time based on the cached prompt.

3. **Is there a way to manually clear the cache?**

   Manual cache clearing is not currently available. Prompts that have not been encountered recently are automatically cleared from the cache. Typical cache evictions occur after 5-10 minutes of inactivity, though sometimes lasting up to a maximum of one hour during off-peak periods.

4. **Will I be expected to pay extra for writing to Prompt Caching?**

   No. Caching happens automatically, with no explicit action needed or extra cost paid to use the caching feature.

5. **Do cached prompts contribute to TPM rate limits?**

   Yes, as caching does not affect rate limits.

6. **Is discounting for Prompt Caching available on Scale Tier and the Batch API?**

   Discounting for Prompt Caching is not available on the Batch API but is available on Scale Tier. With Scale Tier, any tokens that are spilled over to the shared API will also be eligible for caching.

7. **Does Prompt Caching work on Zero Data Retention requests?**

   Yes, Prompt Caching is compliant with existing Zero Data Retention policies.