Laboratory Session #02

Distributed Systems Programming

Daniele Bringhenti

gRPC Features

- gRPC (https://grpc.io/) is a modern open-source **high performance** framework implementing the remote procedure call (***RPC***) paradigm.
- The main features of gRPC are:

1) simple service definition (Protocol Buffer);
2) high performance and scalability;
3) bi-directional streaming support;
4) multi-language and multi-platform.

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gRPC is suitable for **Machine-To-Machine (M2M)** communications.

Topics of the Laboratory Session

Laboratory Session #02 covers the following activities:

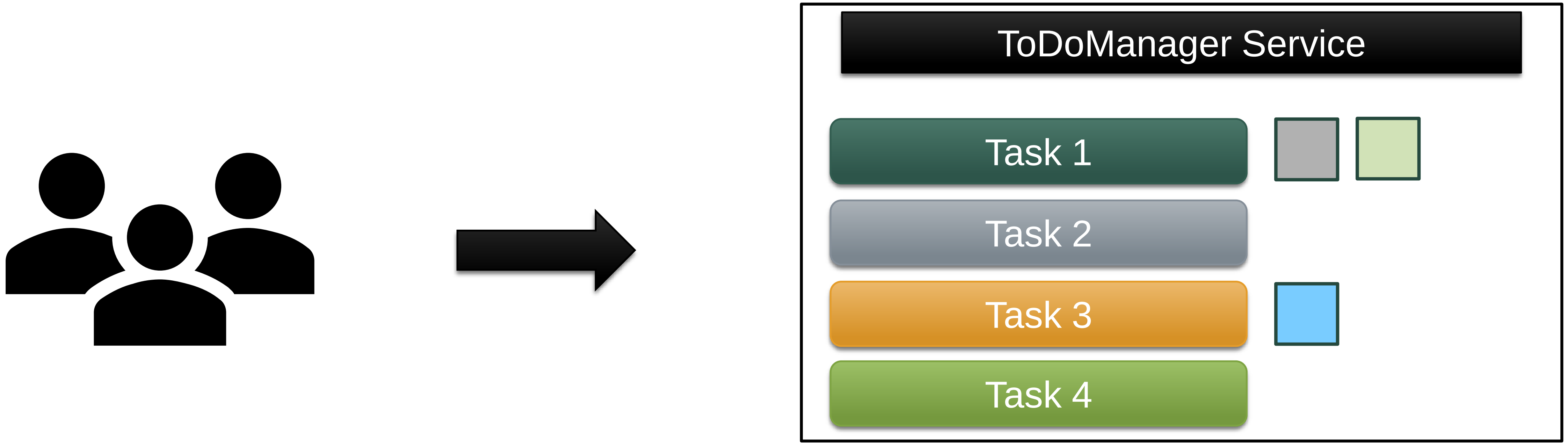
{ REST }

Definition of new **REST APIs** exposed by the ToDoManager service for the management of **images**

gRPC

Integration of a **gRPC client** functionality in the implementation of the ToDoManager service

Image Management in the ToDoManager service (I)



- A user can associate **multiple** images to each task.
- The allowed **media types** are: PNG, JPEG, GIF.
- The service stores the image with its media type.

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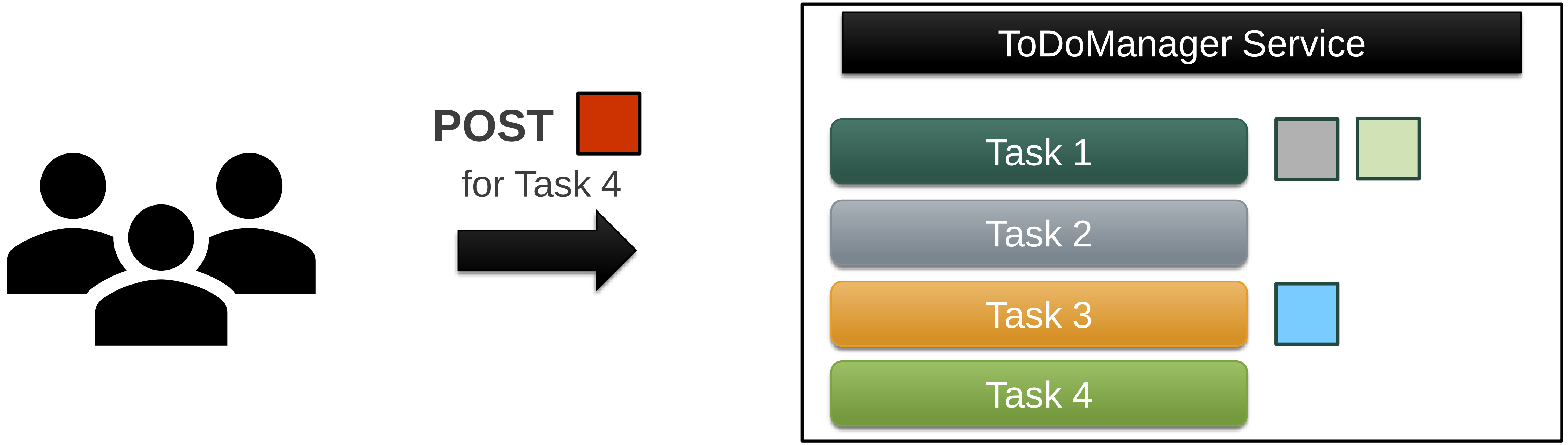

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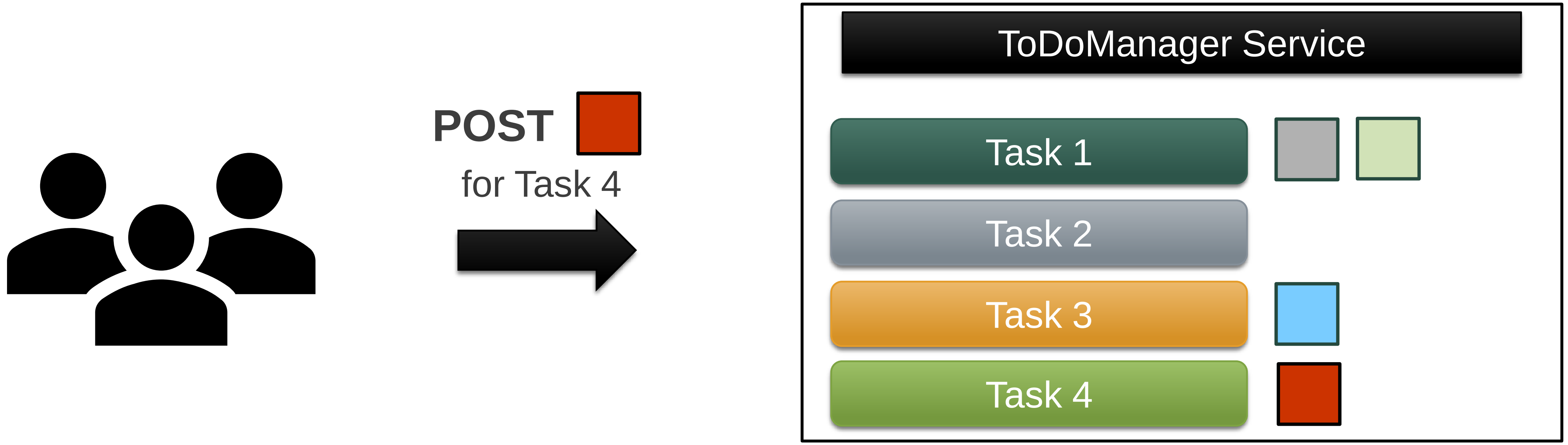

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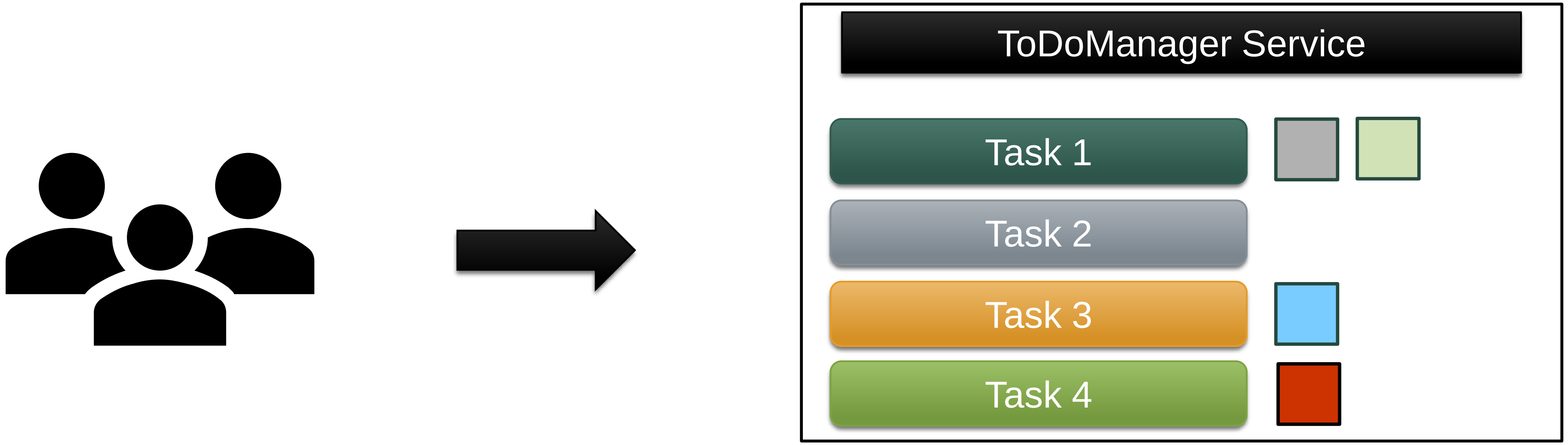

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- The image is not saved anymore server-side.

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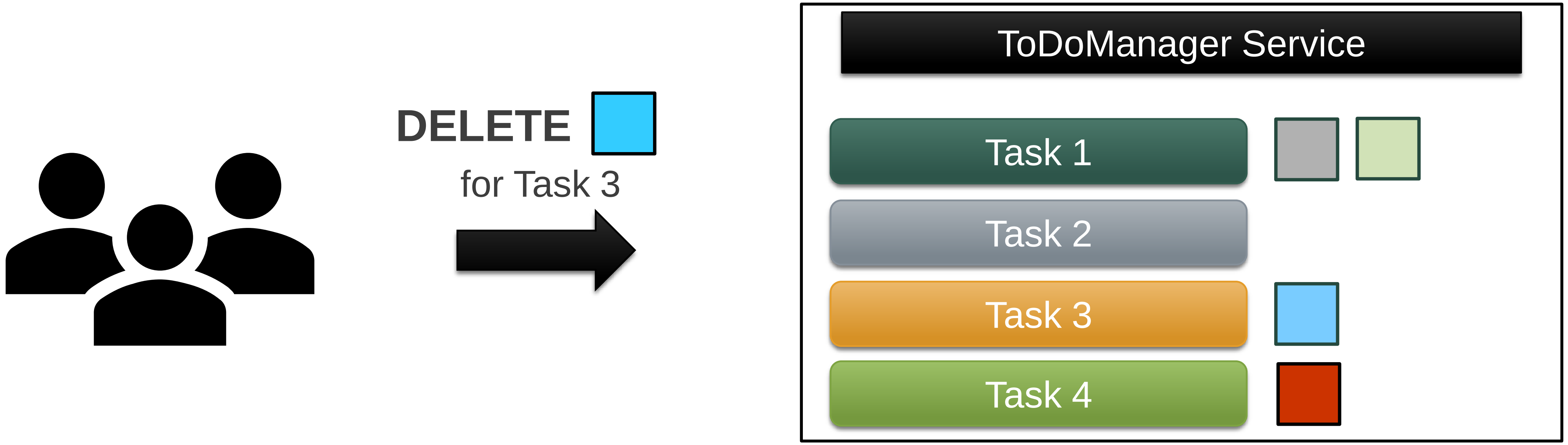

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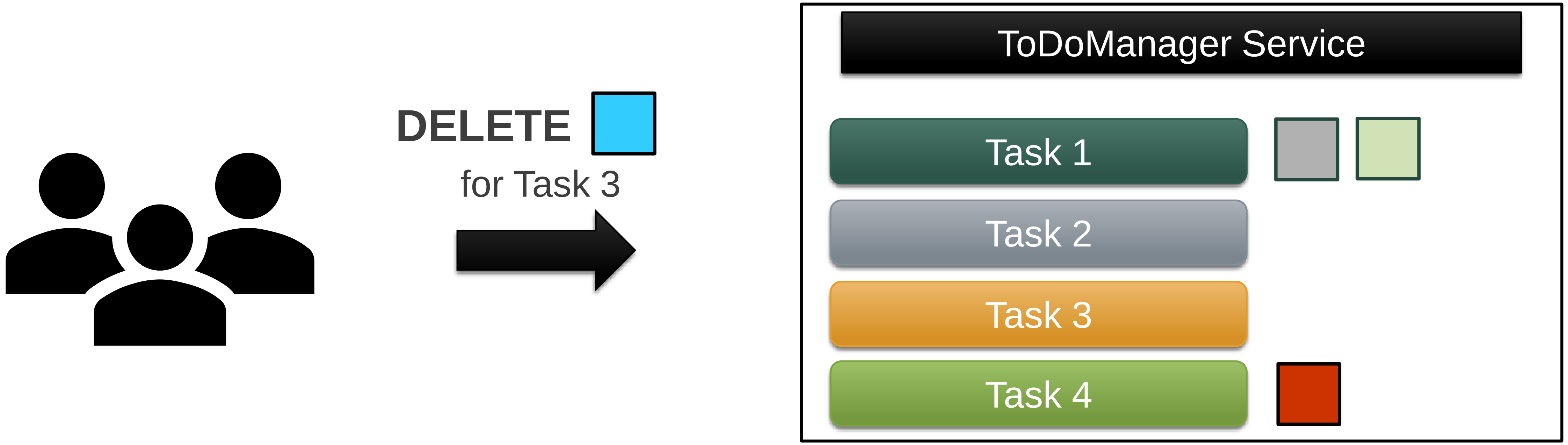

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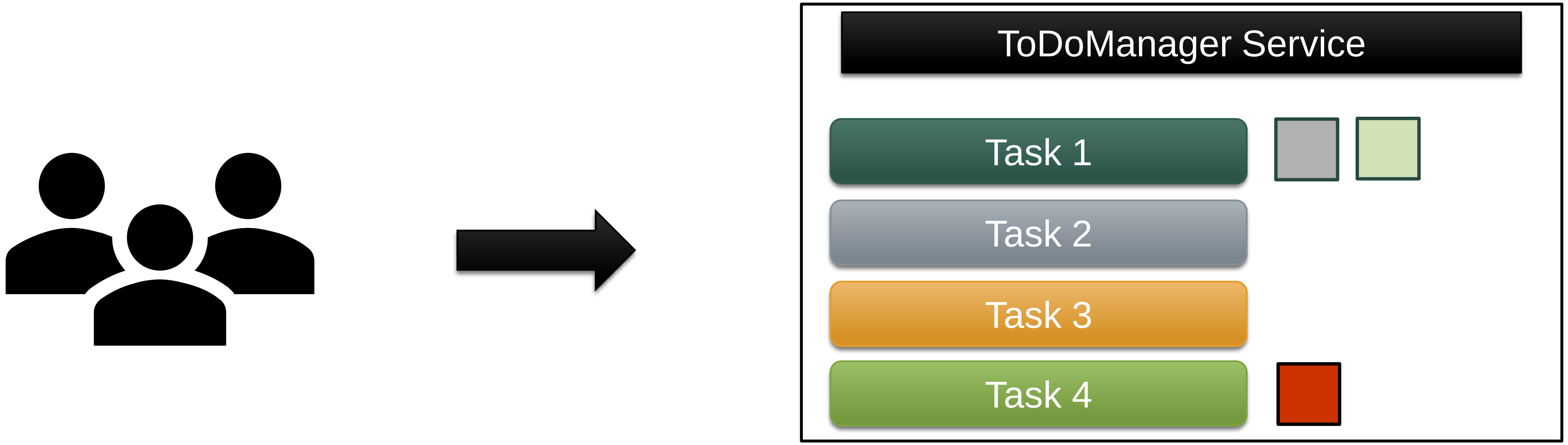

- A user can **retrieve** an image associated to a task.
- The **Accept** header of the HTTP request specifies the requested media type.
- Three media types are supported: image/**png**, image/**jpg**, and image/**gif**. In case the user requests another media type, the operation fails.

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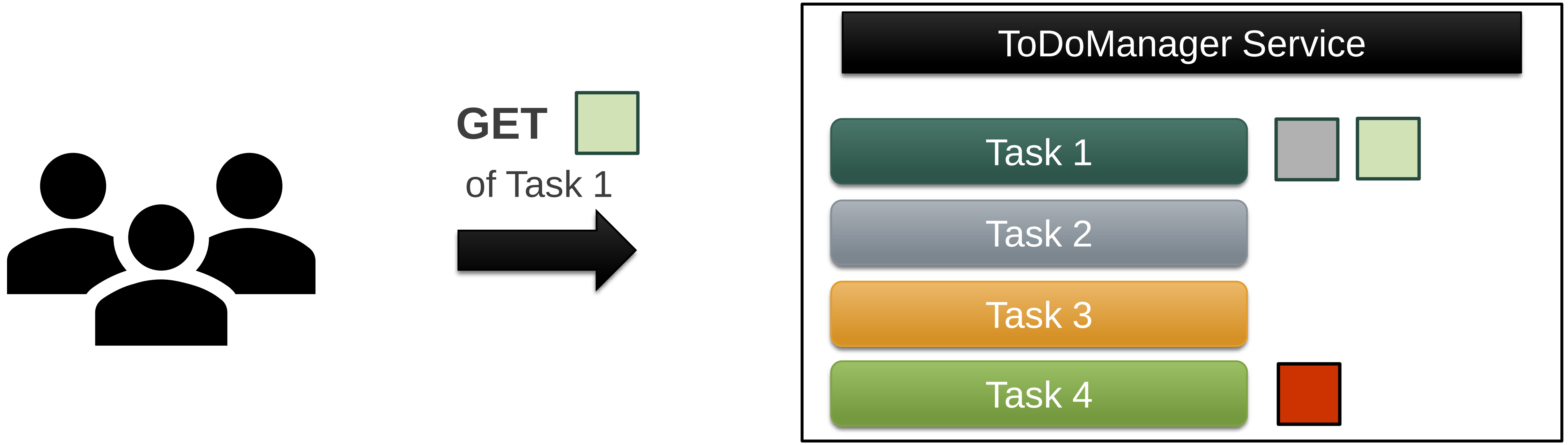

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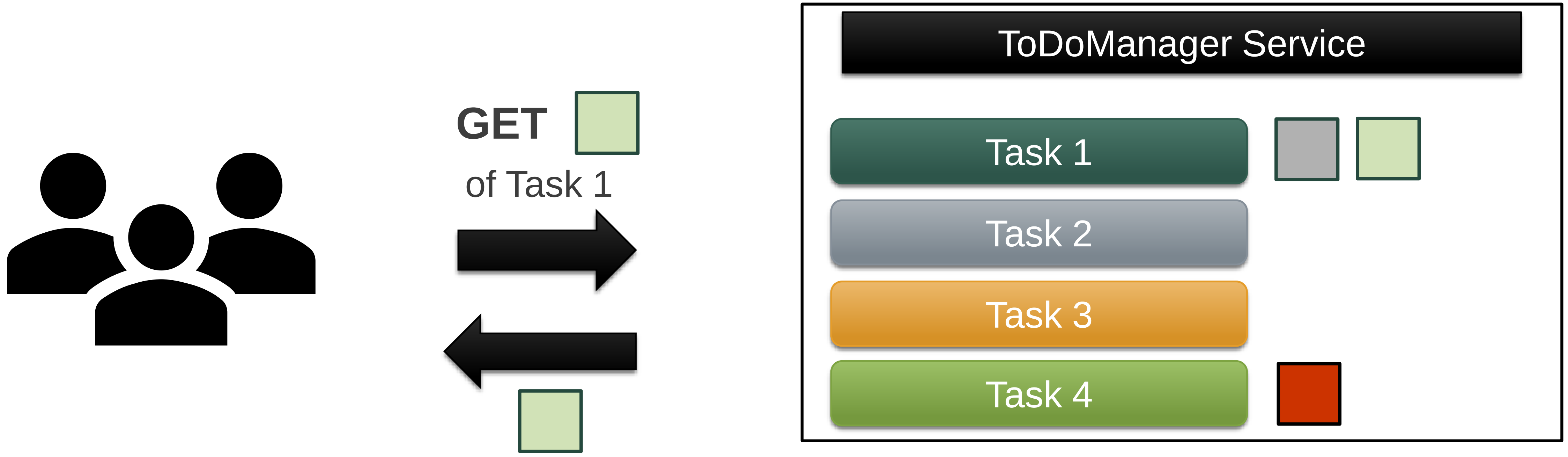

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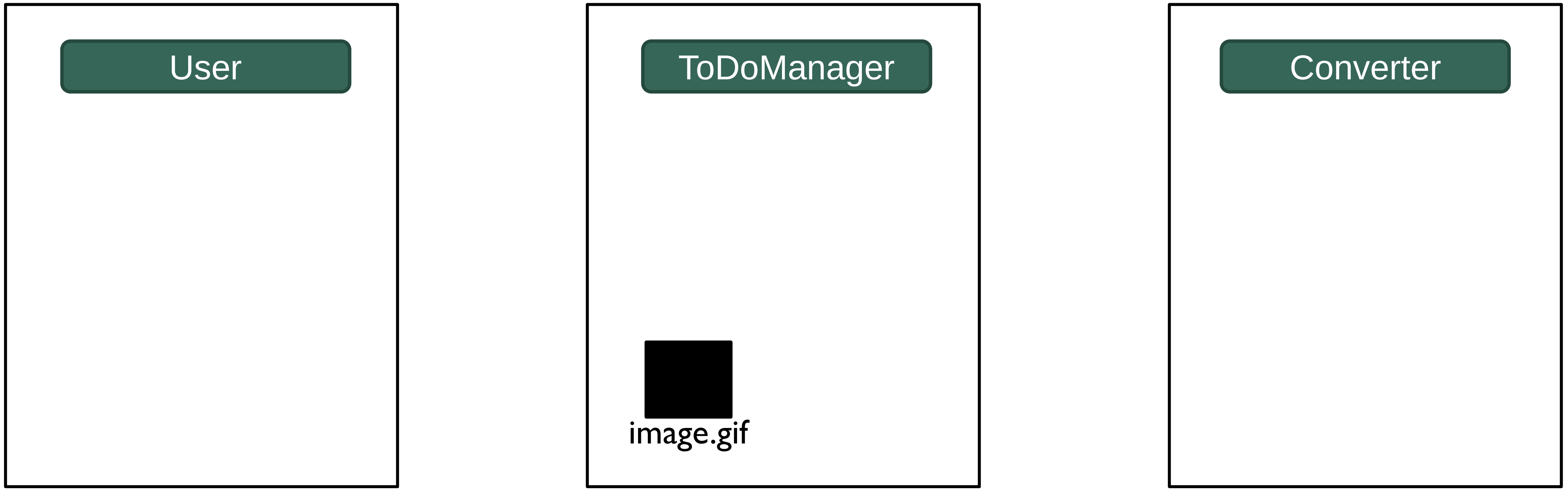
Image Media Type Conversion

But… what happens if a requested image is saved in a **different media type** than the requested one?

- The *ToDoManager* service interacts with another service, called *Converter* service, **delegating** the operation of media type conversion.
- The *ToDoManager* service creates a **gRPC channel** towards the *Converter* service (i.e., the *ToDoManager* service covers the role of gRPC client, the *Converter* service covers the role of gRPC server).

gRPC Communication



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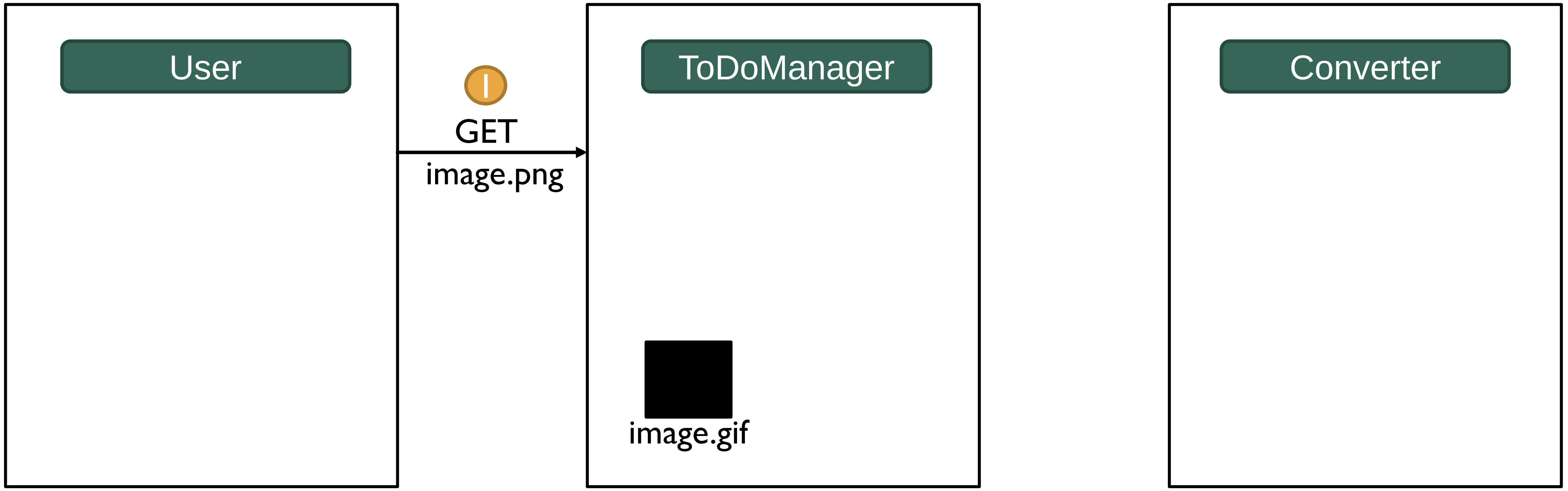

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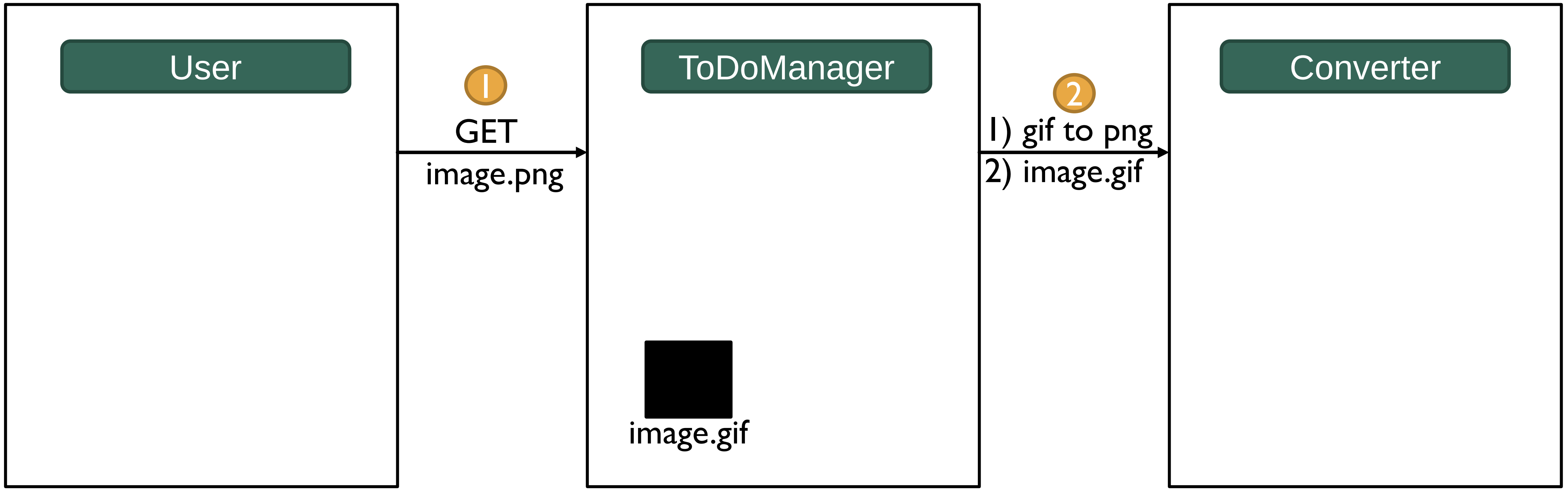

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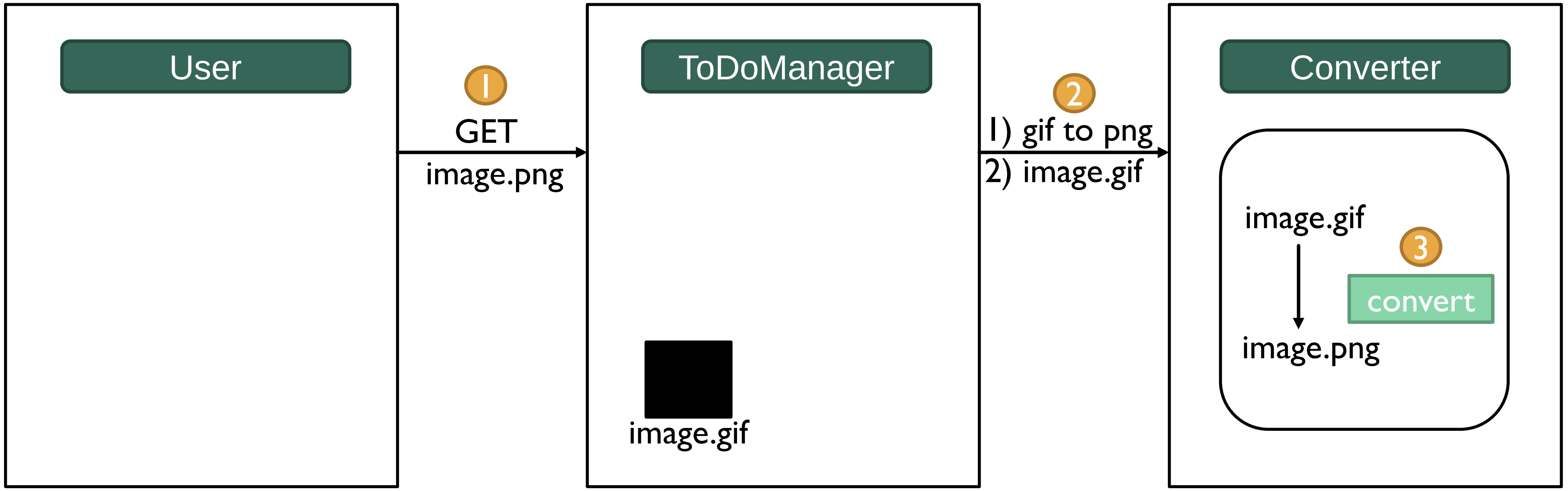

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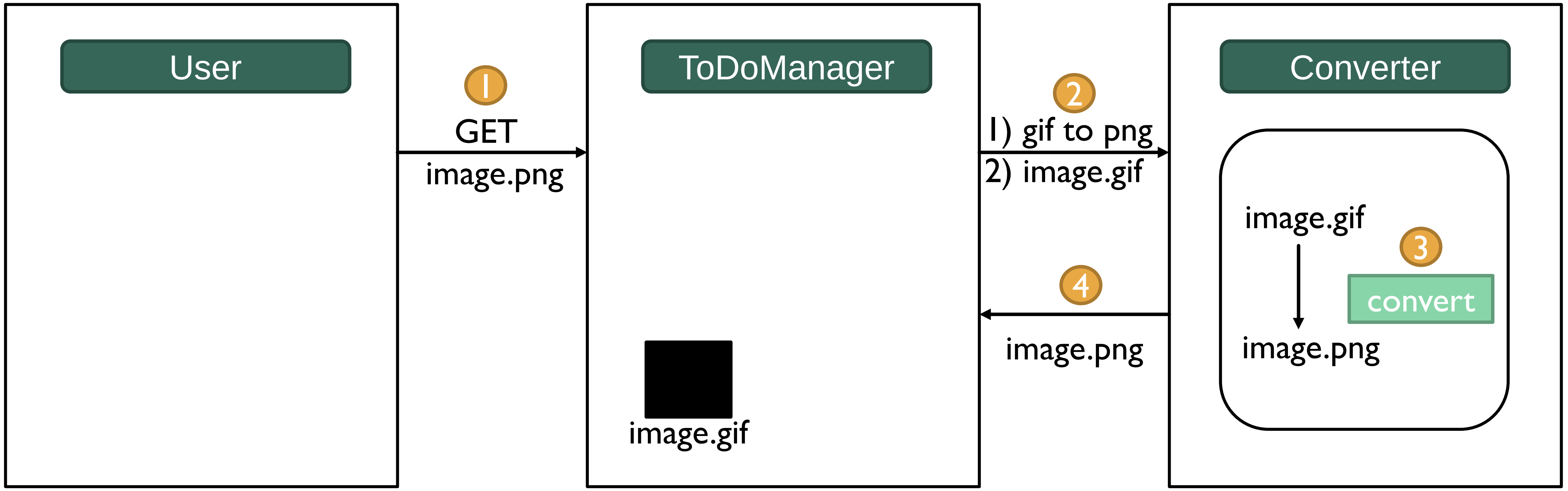

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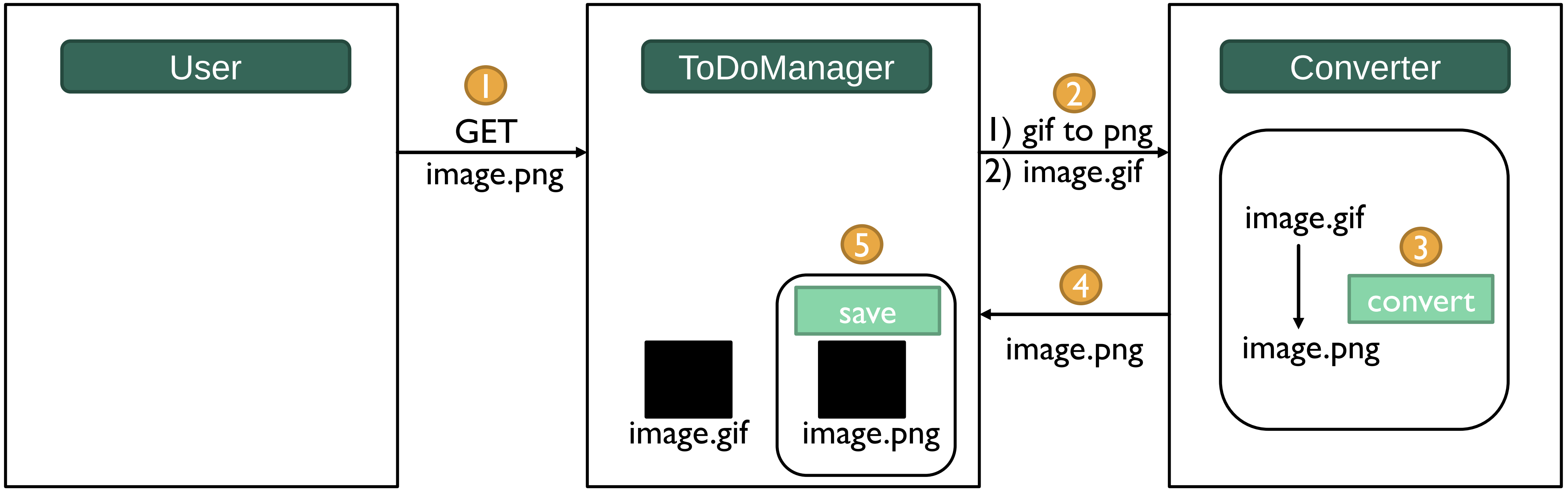

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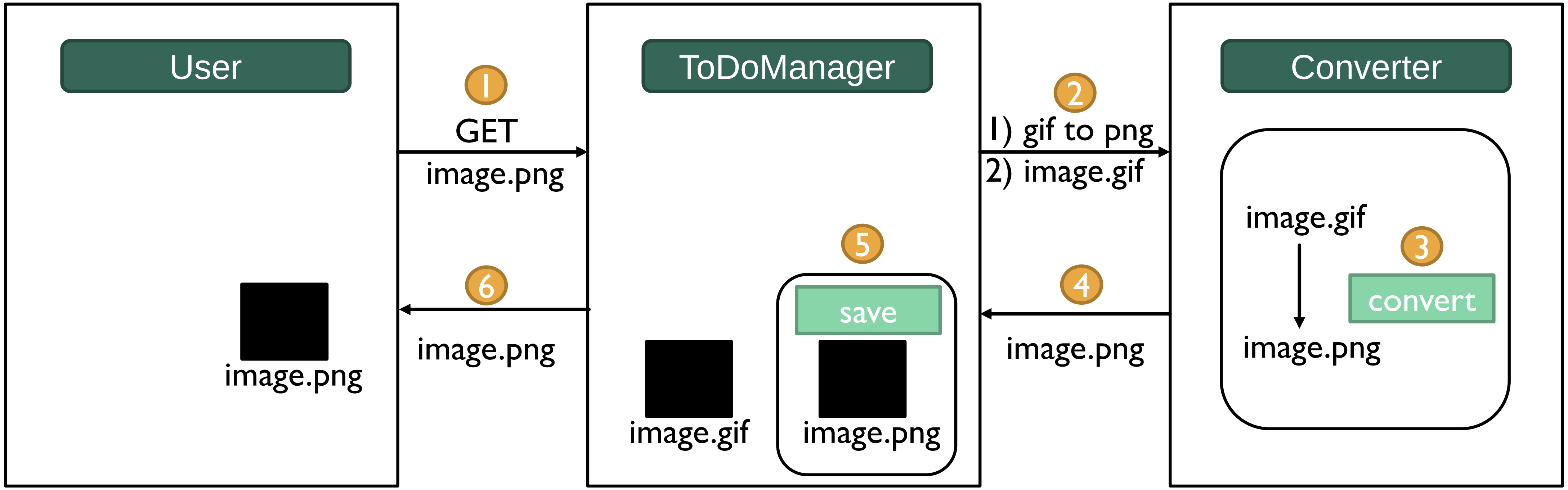

How to manage image files?

Image files must be managed in:

- **Postman**
  - send/receive images in HTTP requests/responses
- *ToDoManager* service (**Node.js**)
  - send/receive images to/from Postman and the *Converter* service
  - locally save images
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Let’s see some tips for the image management!

Thanks for your attention!

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