

Liquidsoap 2

A preview!

Romain Beauxis, Jan. 17, 2021

Timeline

Recent Changes

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- July 24, 2019: First 1.5.0 changelog, internal video format switched to YUV420p

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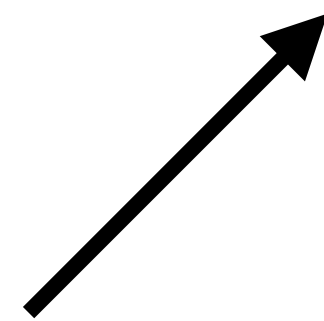
1.5.0

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1.5.0

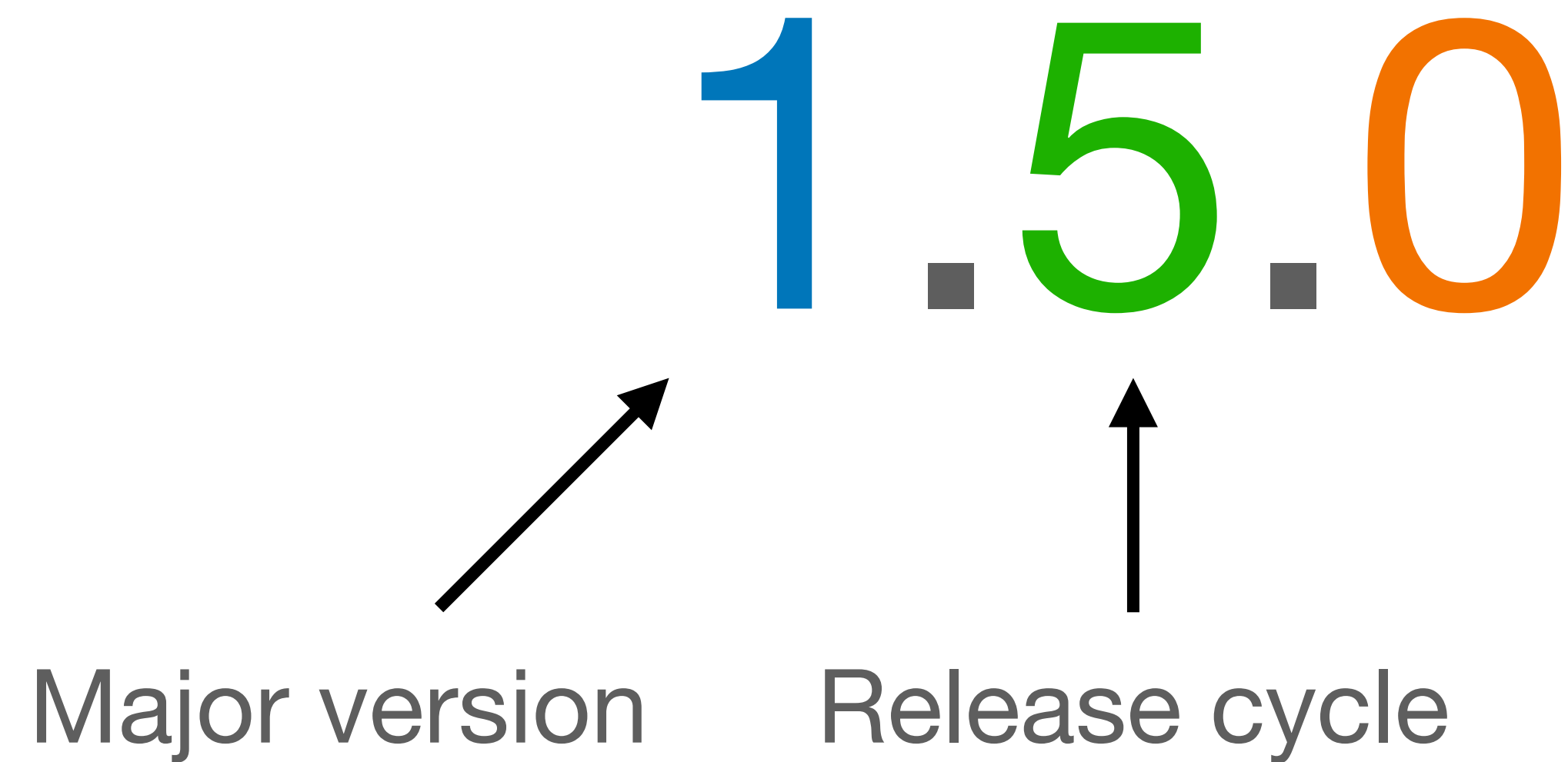


Major version

Timeline

Recent Changes

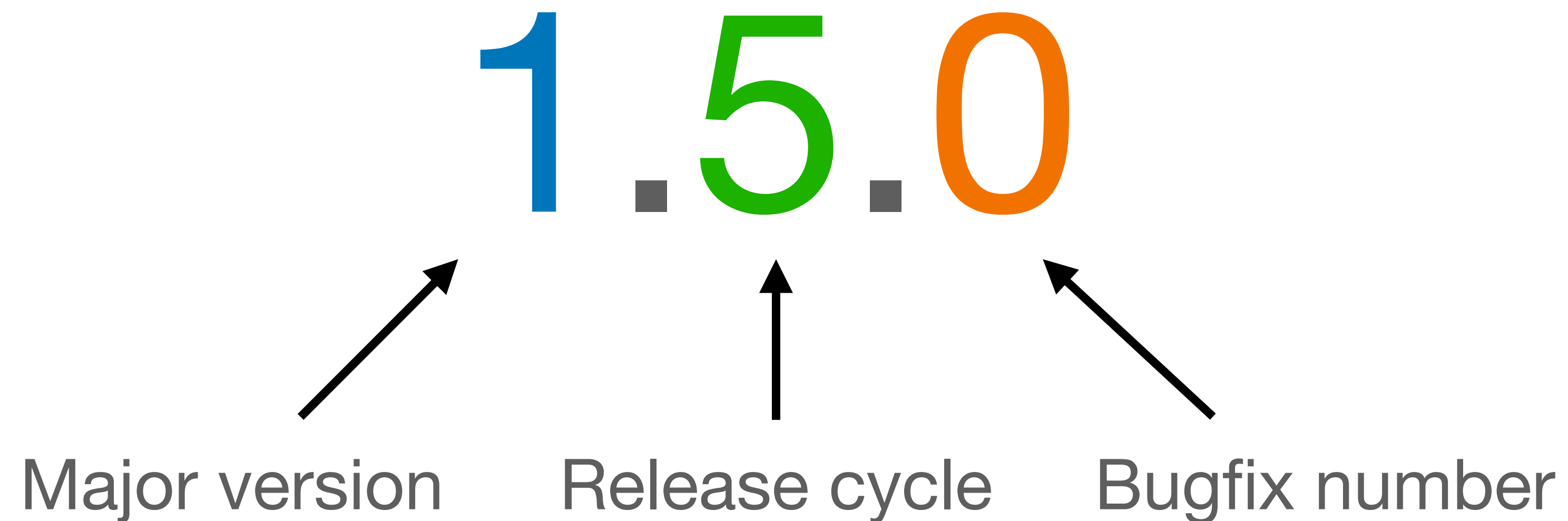
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- July 24, 2019: First 1.5.0 changelog, internal video format switched to YUV420p
- Sept. 29, 2019: Release 1.4.0

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- Feb. 1, 2020: FOSDEM presentation

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- Feb. 10, 2020: Add support for video encoding/decoding using FFmpeg

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- Oct. 31, 2019: Native implementation of request.queue
- Feb. 1, 2020: FOSDEM presentation
- Feb. 10, 2020: Add support for video encoding/decoding using FFmpeg
- May 25, 2020: Compute source kind at runtime, get rid of runtime types

Timeline

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- June 7, 2020: Add support for modules

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- July 30, 2020: Add support for ffmpeg copy encoder/decoder

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- June 18, 2020: Add support for errors and nullable types
- June 20, 2020: Add support for for and while loops
- June 29, 2020: Add support for `x ? y : z` and list and array splats
- July 3, 2020: Add support for extensible frame content
- July 30, 2020: Add support for ffmpeg copy encoder/decoder
- August 28, 2020: Add support for ffmpeg raw encoder/decoder

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- Dec. 12, 2020: FFmpeg inline conversions for raw frames

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- Nov. 15, 2020: Add video, mp4 support to HLS output.
- Dec. 12, 2020: FFmpeg inline conversions for raw frames
- Dec. 25, 2020: FFmpeg inline conversion for encoded frames

Language Changes

More expressivity

- Module and records

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output.icecast

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Language Changes

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output.icecast



```
.{  
  dummy : 'a.'b.'c.(?id : string, ?fallible : bool,  
    ?on_start : (() -> unit), ?on_stop : (() -> unit),  
    ?start : bool, source(audio='a, video='b, midi='c)) ->  
    active_source(audio='a, video='b, midi='c)  
  
  url : 'a.(?id : string, ?fallible : bool, ?on_start : (() -> unit),  
    ?on_stop : (() -> unit), ?start : bool, url : string,  
    format('a), source('a)) -> active_source('a)  
  
  ...  
}
```

Language Changes

More expressivity

- Module and records

http.get

```
- : (?headers : [string * string],  
    ?http_version : string, ?redirect : bool,  
    ?timeout : float, string) ->
```

```
string.{  
  headers : [string * string],  
  status_message : string,  
  status_code : int,  
  protocol_version : string  
}
```


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http.get

```
- : (?headers : [string * string],  
    ?http_version : string, ?redirect : bool,  
    ?timeout : float, string) ->
```

```
string.{  
  headers : [string * string],  
  status_message : string,  
  status_code : int,  
  protocol_version : string  
}
```

```
"<html>...</html>".{  
  headers = [  
    ("connection", "close"),  
    ("content-length", "16977"),  
    ...  
  ],  
  status_message = "OK",  
  status_code = 200,  
  protocol_version = "HTTP/1.1"  
}
```

Language Changes

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http.get

```
- : (?headers : [string * string],  
    ?http_version : string, ?redirect : bool,  
    ?timeout : float, string) ->
```

```
string.{  
  headers : [string * string],  
  status_message : string,  
  status_code : int,  
  protocol_version : string  
}
```

```
x = https.get("https://liquidsoap.info")
```

```
x.status_code  
- : int = 200
```

```
x.status_message  
- : string = "OK"
```

```
"html: #{x}"  
- : string = "html: <HTML>...</HTML>\r\n"
```

Language Changes

More expressivity

- Module and records

```
source(audio=?A, video=?B, midi=none)
  .{
    time : () -> float,
    shutdown : () -> unit,
    fallible : () -> bool,
    skip : () -> unit,
    seek : (float) -> float,
    is_up : () -> bool,
    remaining : () -> float,
    on_track : ((([string * string]) -> unit)) -> unit,
    on_shutdown : (((() -> unit)) -> unit,
    on_metadata : ((([string * string]) -> unit)) -> unit,
    is_ready : () -> bool,
    id : (() -> string)
  }
```

Language Changes

More expressivity

- Module and records

```
s = single("/path/to/file.mp3")
```

```
s.skip()
```

```
source(audio=?A, video=?B, midi=none)
```

```
.{  
  time : () -> float,  
  shutdown : () -> unit,  
  fallible : () -> bool,  
  skip : () -> unit,  
  seek : (float) -> float,  
  is_up : () -> bool,  
  remaining : () -> float,  
  on_track : ((([string * string]) -> unit)) -> unit,  
  on_shutdown : (((() -> unit)) -> unit),  
  on_metadata : ((([string * string]) -> unit)) -> unit,  
  is_ready : () -> bool,  
  id : (() -> string)  
}
```

Language Changes

More expressivity

- Module and records

```
s = single("/path/to/file.mp3")
```

```
s.skip()
```

```
s = insert_metadata(s)
```

```
s.insert_metadata(  
  [("title", "Awesome Track")  
])
```

```
source(audio=?A, video=?B, midi=none)
```

```
.{  
  time : () -> float,  
  shutdown : () -> unit,  
  fallible : () -> bool,  
  skip : () -> unit,  
  seek : (float) -> float,  
  is_up : () -> bool,  
  remaining : () -> float,  
  on_track : ((([string * string]) -> unit)) -> unit,  
  on_shutdown : (((() -> unit)) -> unit),  
  on_metadata : ((([string * string]) -> unit)) -> unit,  
  is_ready : () -> bool,  
  id : (() -> string)  
}
```

Language Changes

More expressivity

- Module and records

libs/deprecations.liq:

```
server.register(  
  "stop",  
  namespace=s.id(),  
  description="...",  
  fun (_) -> begin  
    s.stop()  
    "Done"  
  end)
```

```
source(audio=?A, video=?B, midi=none)  
  .{  
    time : () -> float,  
    shutdown : () -> unit,  
    fallible : () -> bool,  
    skip : () -> unit,  
    seek : (float) -> float,  
    is_up : () -> bool,  
    remaining : () -> float,  
    on_track : ((([string * string]) -> unit)) -> unit,  
    on_shutdown : (((() -> unit)) -> unit),  
    on_metadata : ((([string * string]) -> unit)) -> unit,  
    is_ready : () -> bool,  
    id : (() -> string)  
  }
```

Language Changes

More expressivity

- Nullable type

```
x = null()
```

```
y = x ?? "foo"
```

```
y : string = "foo"
```

```
x = null("bla")
```

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x = null("bla")
```

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y = x ?? "foo"
```

```
y : string = "bla"
```

```
def f(~opt=null(), x) =  
  y = opt ?? "no arg"  
  print(y)  
  print(x)  
end
```

```
f : (?opt : string?, 'a) -> unit = <fun>
```


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x = null()
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y = x ?? "foo"
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```
y : string = "foo"
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def f(~opt=null(), x) =  
  y = opt ?? "no arg"  
  print(y)  
  print(x)  
end
```

```
f : (?opt : string?, 'a) -> unit = <fun>
```

```
f("foo")  
no arg  
foo
```

Language Changes

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- Nullable type

```
x = null()
```

```
y = x ?? "foo"
```

```
y : string = "foo"
```

```
x = null("bla")
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```
y : string = "bla"
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```
def f(~opt=null(), x) =  
  y = opt ?? "no arg"  
  print(y)  
  print(x)  
end
```

```
f : (?opt : string?, 'a) -> unit = <fun>
```

```
f("foo")
```

```
no arg
```

```
foo
```

```
f(opt="gni", "foo")
```

```
gni
```

```
foo
```

Language Changes

More expressivity

- Errors

```
x = try
```

```
...
```

```
catch err do
```

```
...
```

```
end
```

Language Changes

More expressivity

- Errors

```
x = try
```

```
...
```

```
catch err in [...] do
```

```
...
```

```
end
```

Language Changes

More expressivity

- Errors

```
x = try
  ...
catch err in [...] do
  ...
end
```

```
err = error.register("foo")
err : error = error(kind="foo",message=none)
```

```
error.message(err)
- : string? = null
error.kind(err)
- : string = "foo"
```

Language Changes

More expressivity

- Errors

```
x = try
```

```
...
```

```
catch err do
```

```
  msg = error.message(err) ?? "msg"
```

```
...
```

```
end
```

```
err = error.register("foo")
```

```
err : error = error(kind="foo",message=none)
```

```
error.message(err)
```

```
- : string? = null
```

```
error.kind(err)
```

```
- : string = "foo"
```

Language Changes

More expressivity

- Splats

```
let [x, _, z, ...t] = [1,2,3,4]
```

```
x : int = 1
```

```
z : int = 3
```

```
t : [int] = [4]
```

```
x = [1, ...[2, 3, 4], 5, ...[6, 7]]
```

```
x : [int] = [1, 2, 3, 4, 5, 6, 7]
```

Language Changes

More expressivity

- Splats

```
let [x, _, z, ...t] = [1,2,3,4]
```

```
x : int = 1
```

```
z : int = 3
```

```
t : [int] = [4]
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```
x = [1, ...[2, 3, 4], 5, ...[6, 7]]
```

```
x : [int] = [1, 2, 3, 4, 5, 6, 7]
```

```
let (x, _, z) = (1,2,3)
```

```
(x, _, z) : int * int * int = (1, 2, 3)
```


FFmpeg integration

Anything is possible!

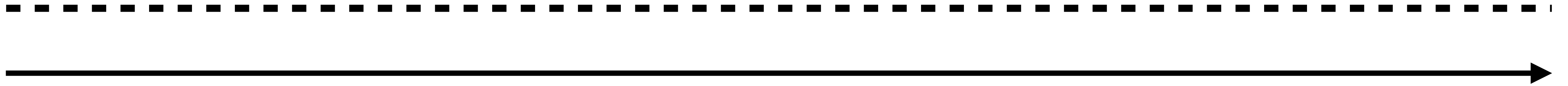
FFmpeg integration

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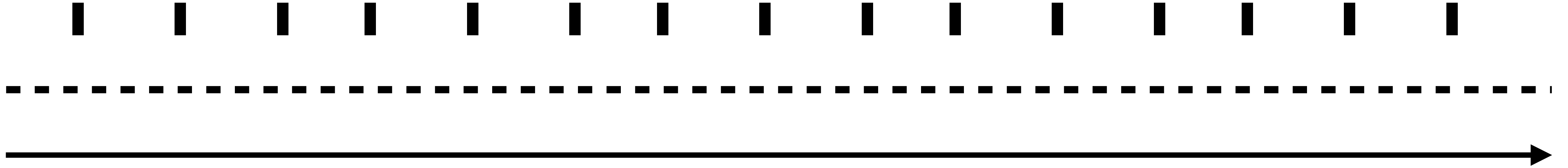
FFmpeg integration

Anything is possible!



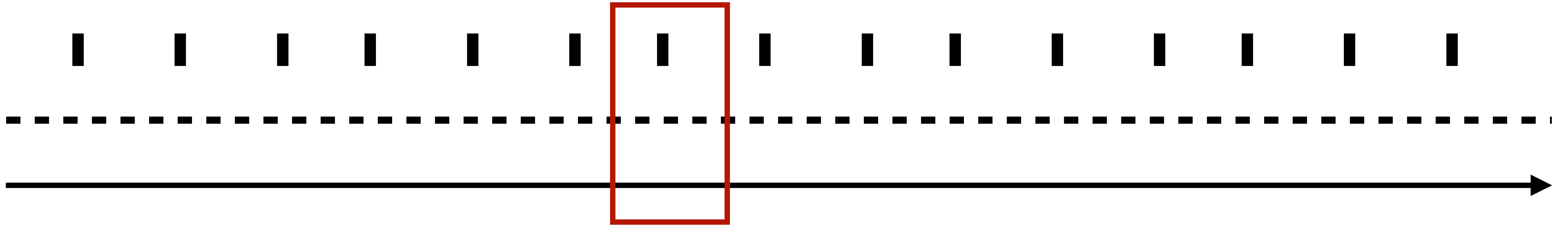
FFmpeg integration

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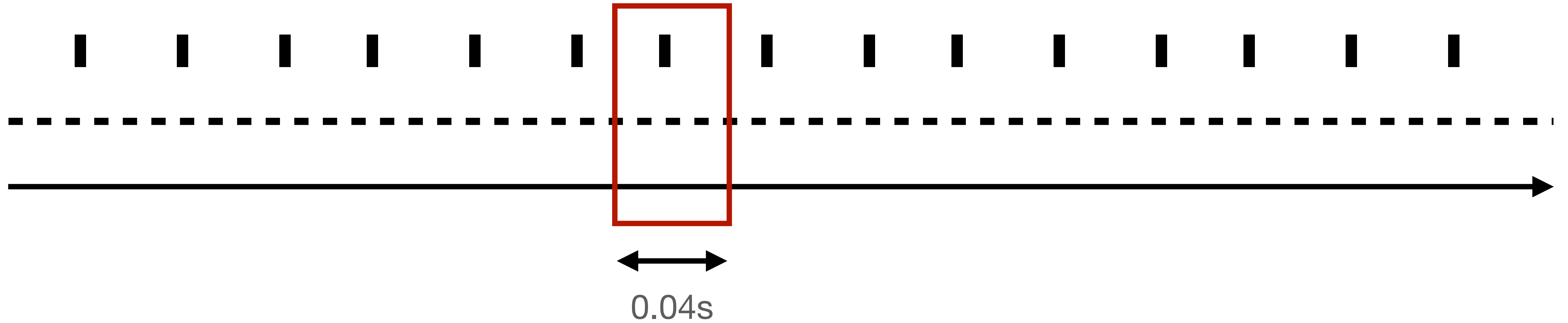
FFmpeg integration

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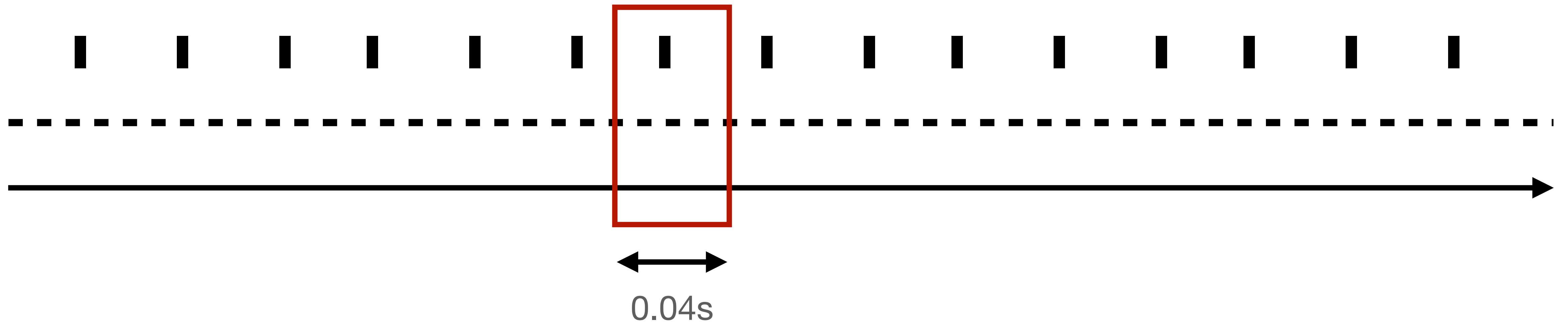
FFmpeg integration

Anything is possible!



FFmpeg integration

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[frame:3] Frame size must be a multiple of 1764 ticks = 1764 audio samples = 1 video samples.

[frame:3] Targetting 'frame.duration': 0.04s = 1764 audio samples = 1764 ticks.

[frame:3] Frames last 0.04s = 1764 audio samples = 1 video samples = 1764 ticks.

FFmpeg integration

Anything is possible!

```
single("/path/to/file.mp3")
```



FFmpeg integration

Anything is possible!

```
single("/path/to/file.mp3")
```



```
playlist("/path/to/directory/")
```



FFmpeg integration

Anything is possible!

```
single("/path/to/file.mp3")
```



```
playlist("/path/to/directory/")
```



```
request.queue(...)
```



FFmpeg integration

Anything is possible!

```
single("/path/to/file.mp3")
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```
playlist("/path/to/directory/")
```



```
request.queue(...)
```



```
input.harbor(...)
```



FFmpeg integration

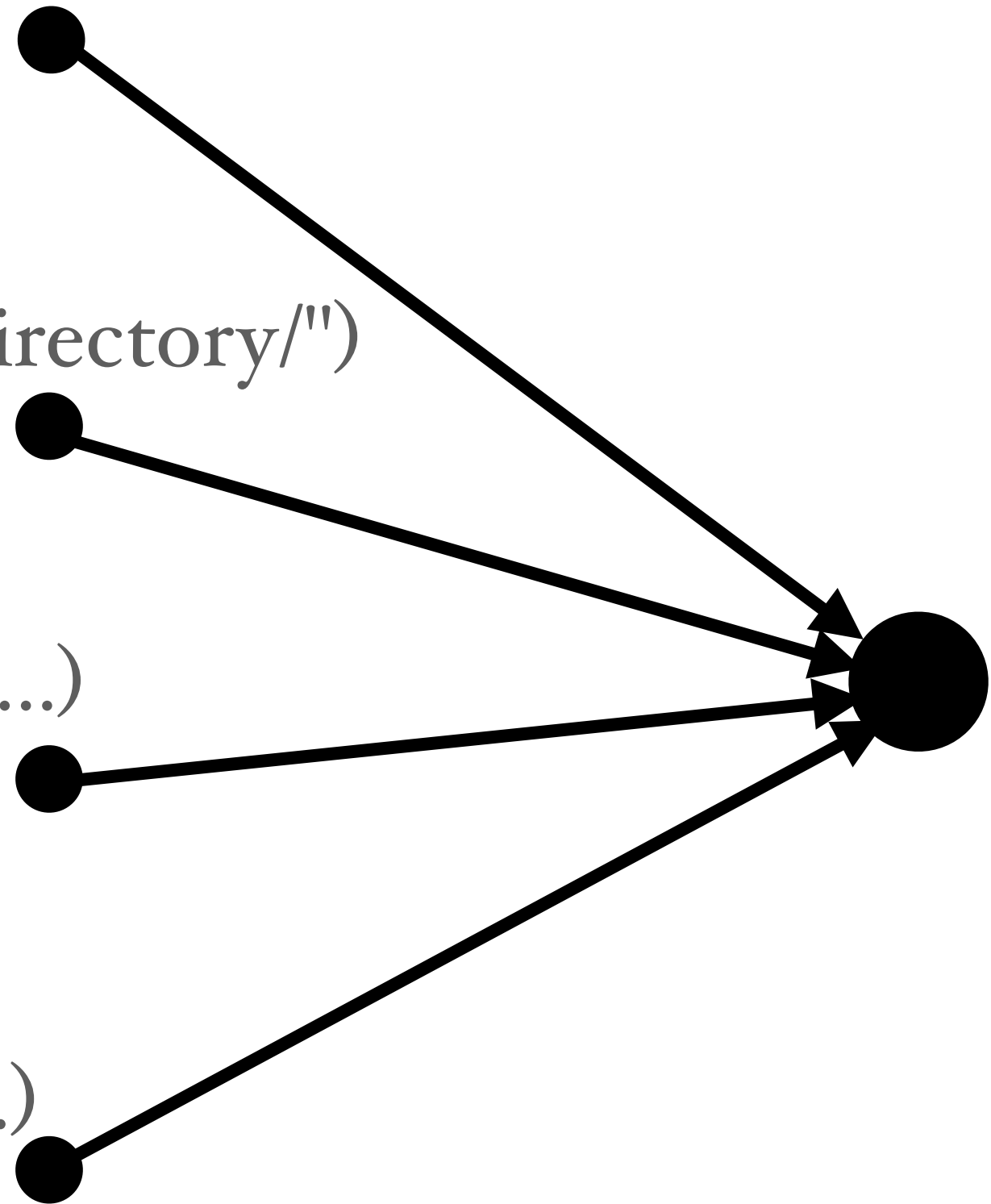
Anything is possible!

`single("/path/to/file.mp3")`

`playlist("/path/to/directory/")`

`request.queue(...)`

`input.harbor(...)`



FFmpeg integration

Anything is possible!

`single("/path/to/file.mp3")`

`playlist("/path/to/directory/")`

`request.queue(...)`

`input.harbor(...)`

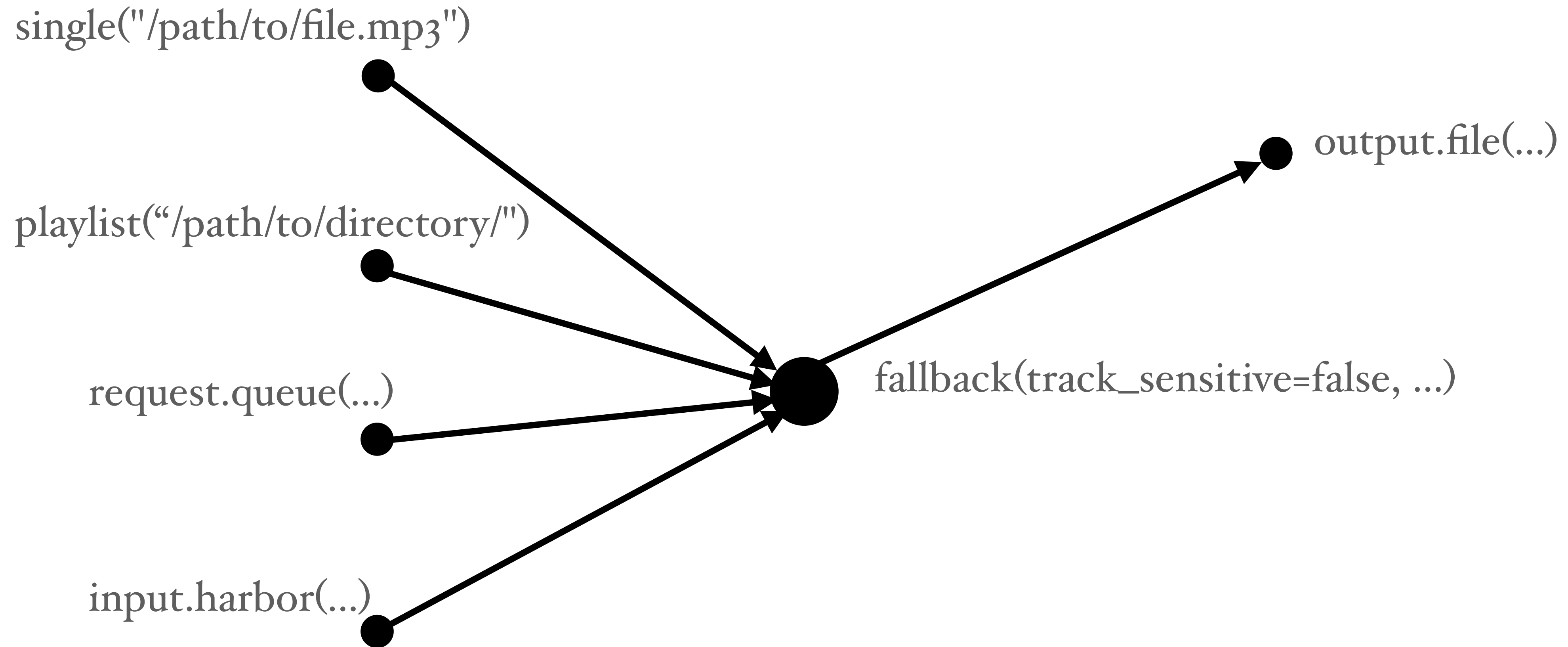
`fallback(track_sensitive=false, ...)`



```
graph LR; A["single('/path/to/file.mp3')"] --> F["fallback(track_sensitive=false, ...)"]; B["playlist('/path/to/directory/')"] --> F; C["request.queue(...)"] --> F; D["input.harbor(...)"] --> F;
```

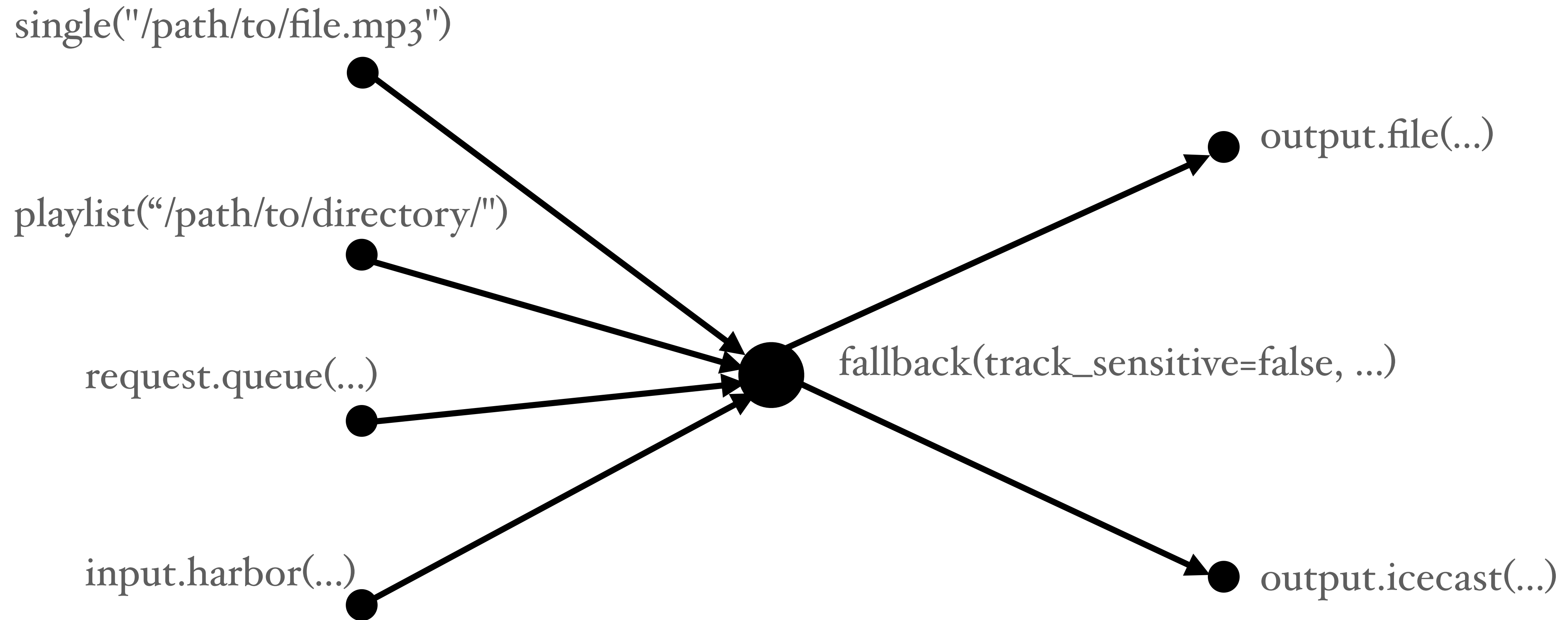
FFmpeg integration

Anything is possible!



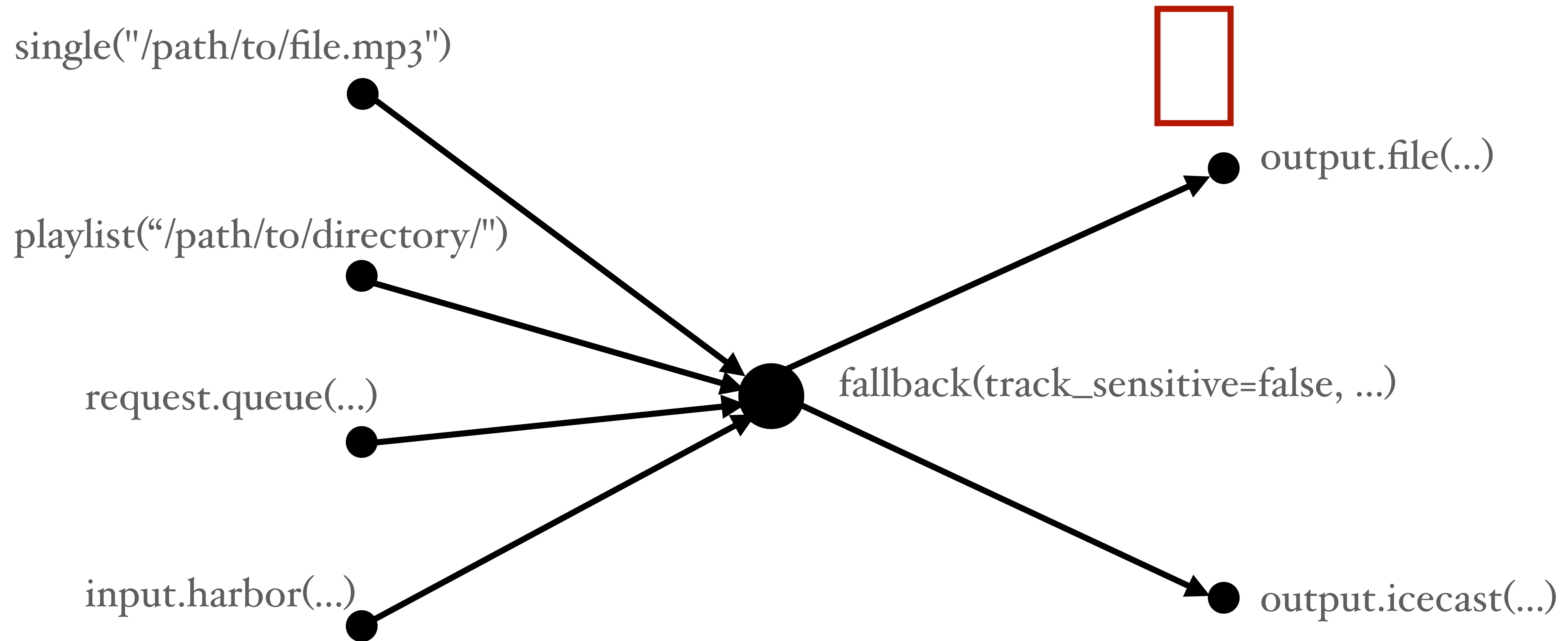
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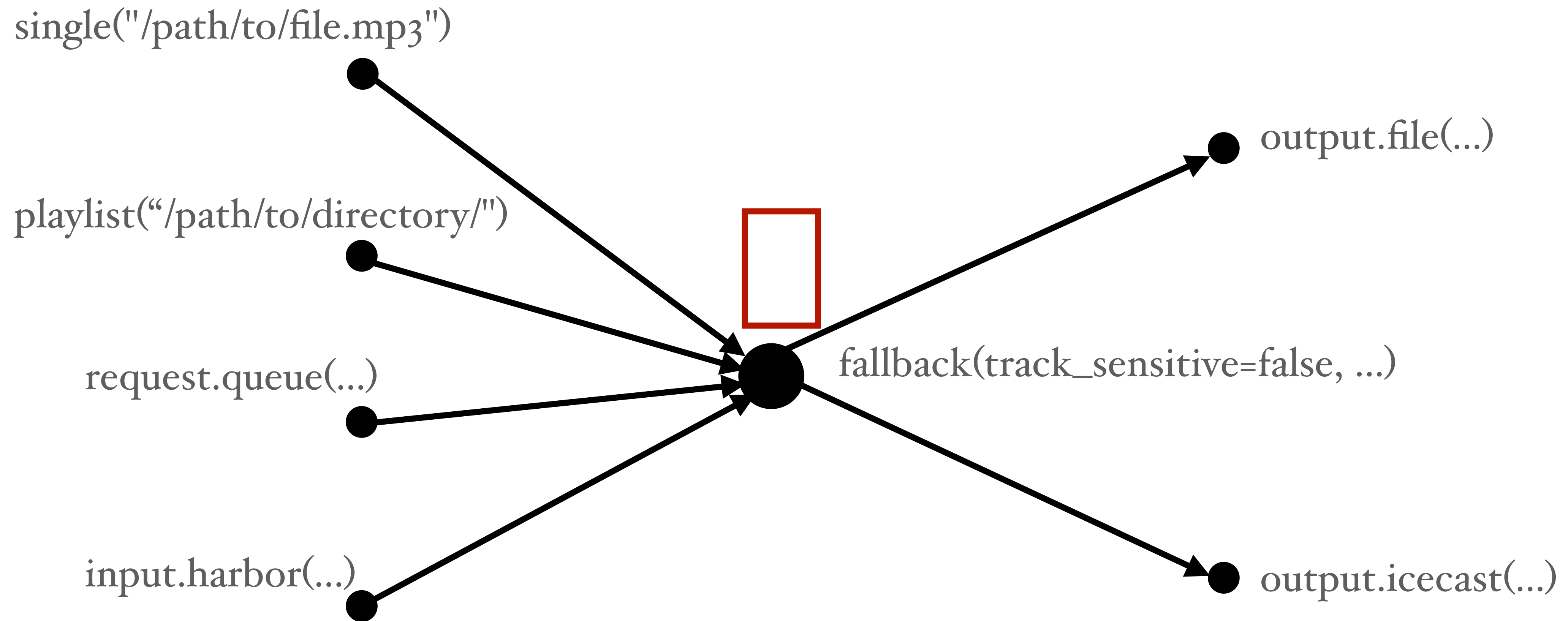
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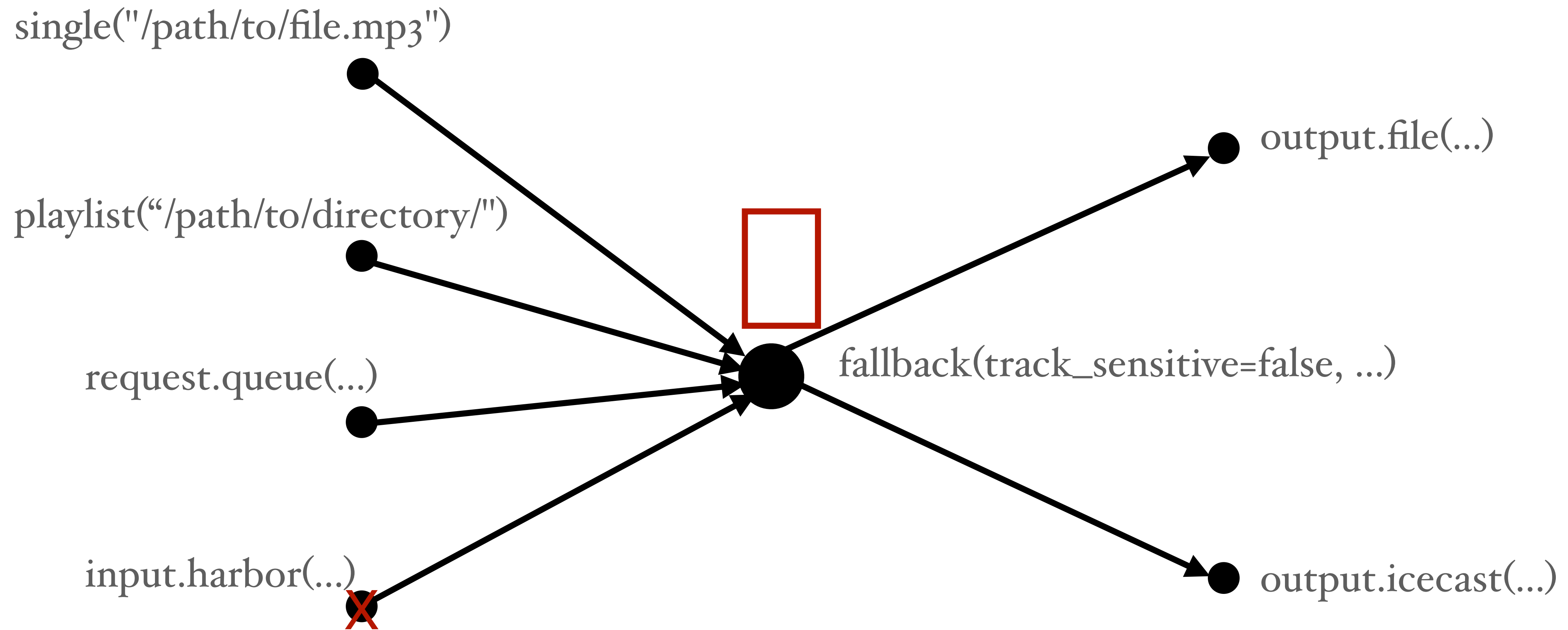
FFmpeg integration

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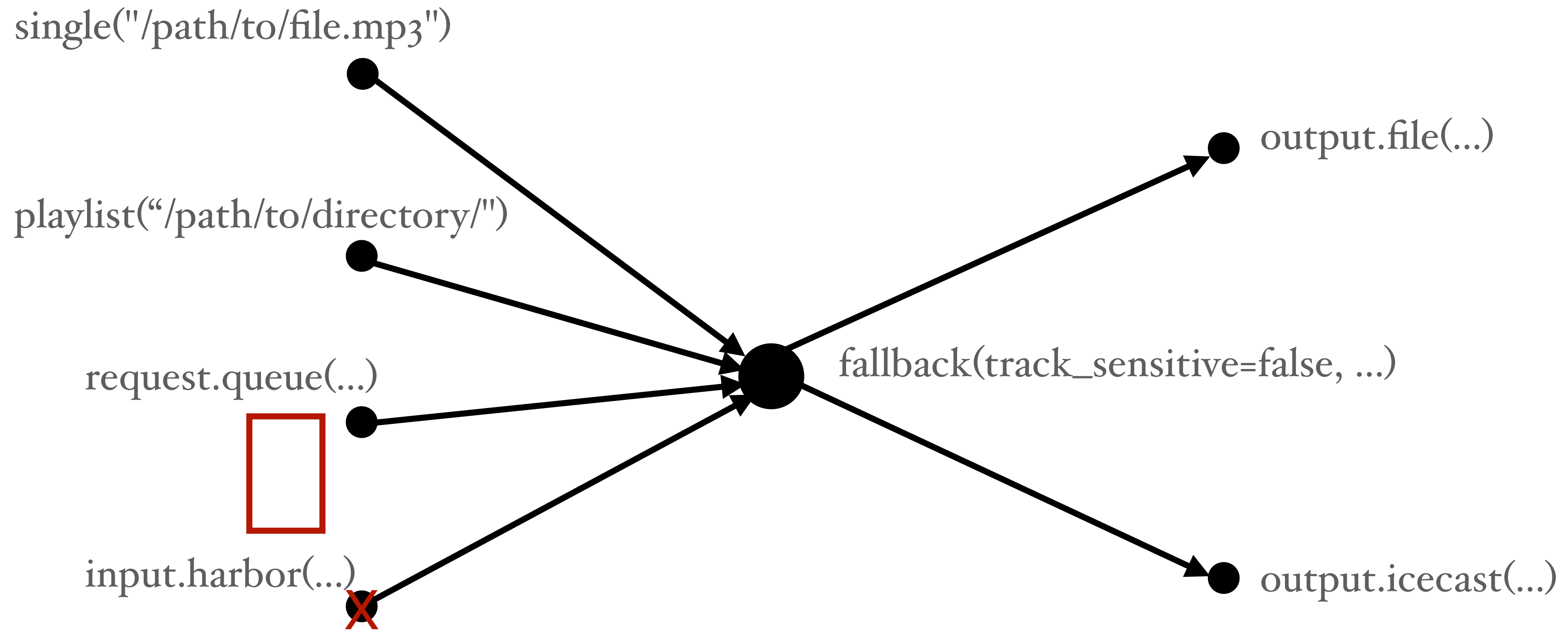
FFmpeg integration

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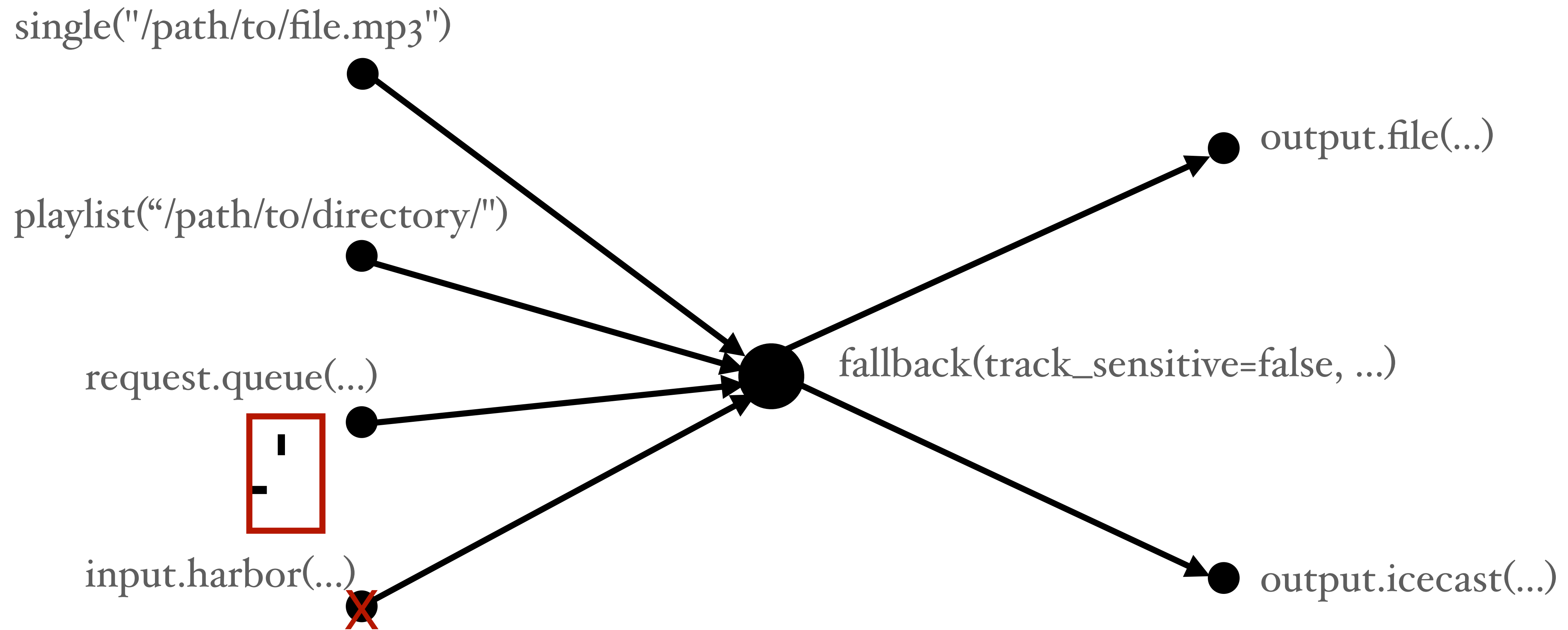
FFmpeg integration

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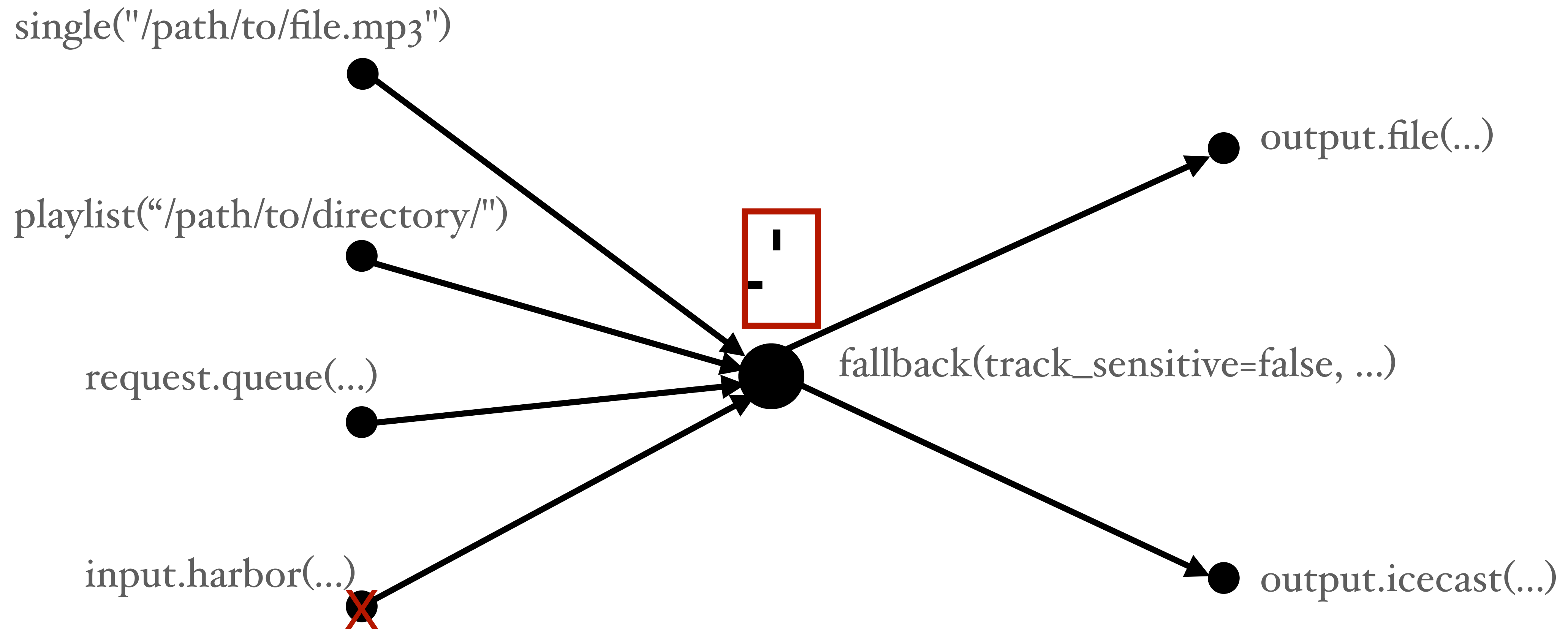
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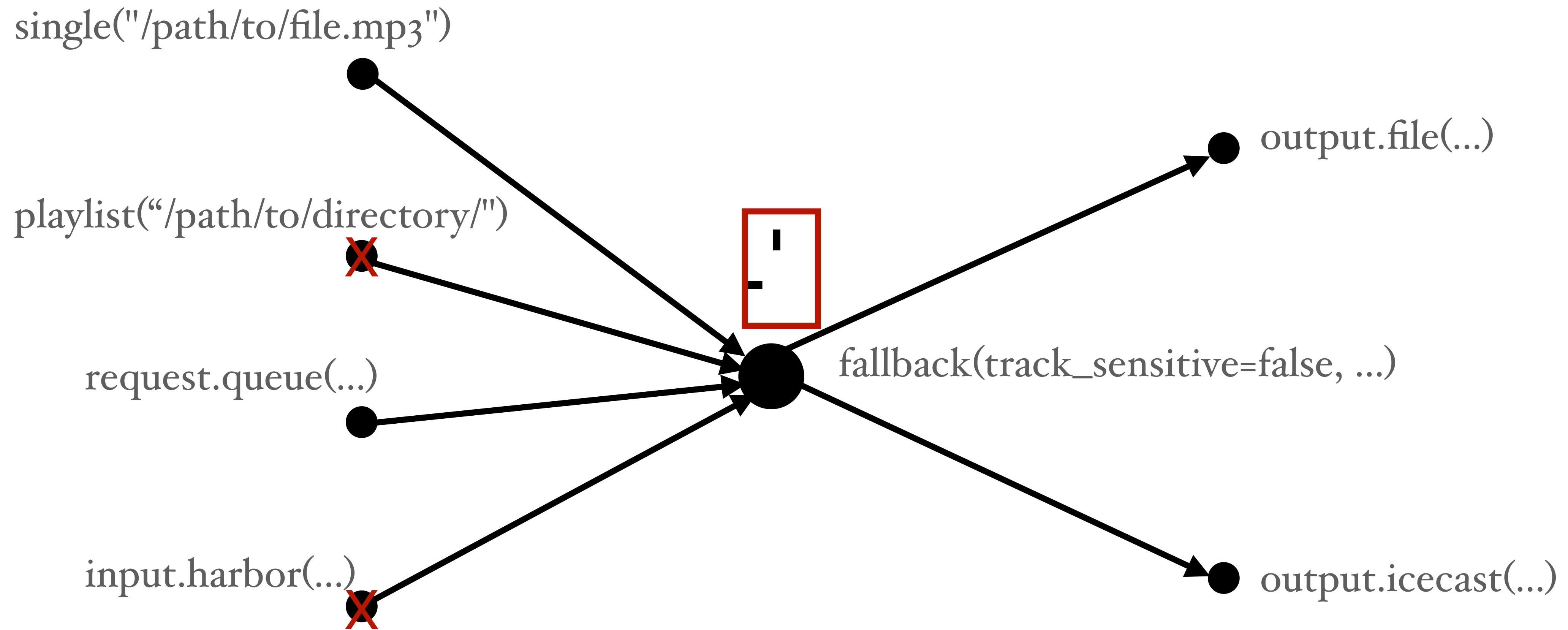
FFmpeg integration

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FFmpeg integration

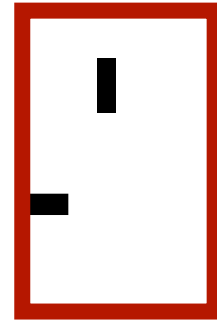
Anything is possible!



FFmpeg integration

Anything is possible!

single("/path/to/file.mp3")



~~playlist("/path/to/directory/")~~

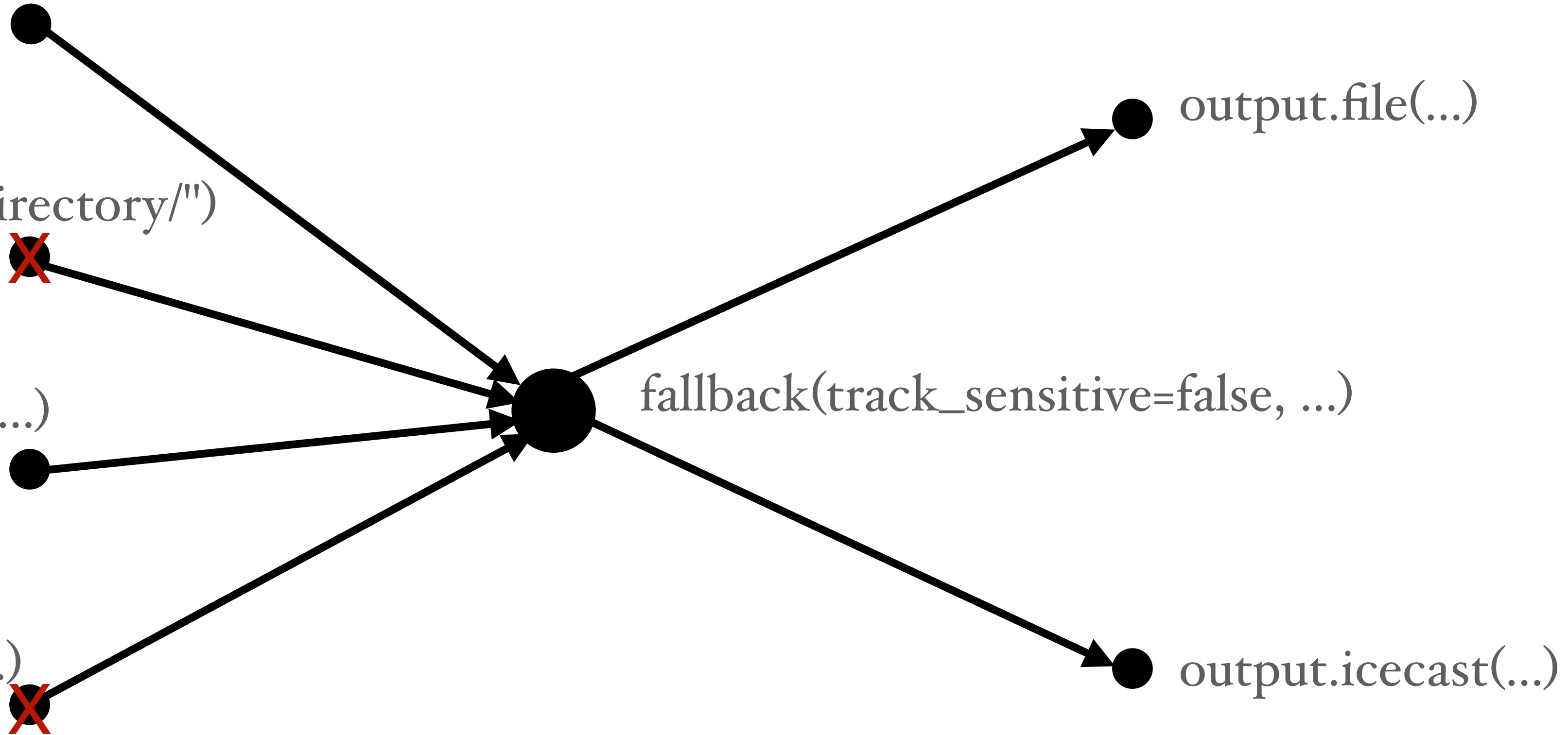
request.queue(...)

~~input.harbor(...)~~

fallback(track_sensitive=false, ...)

output.file(...)

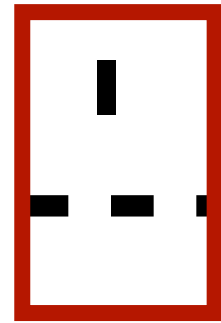
output.icecast(...)



FFmpeg integration

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`single("/path/to/file.mp3")`



`playlist("/path/to/directory/")`

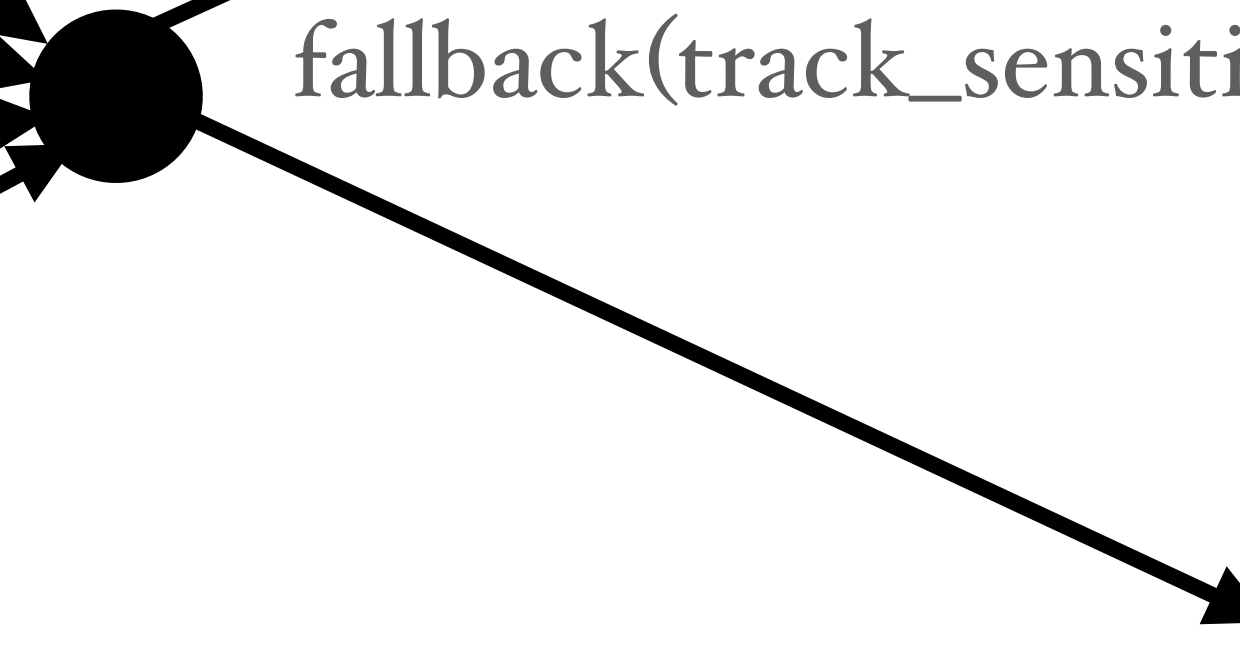
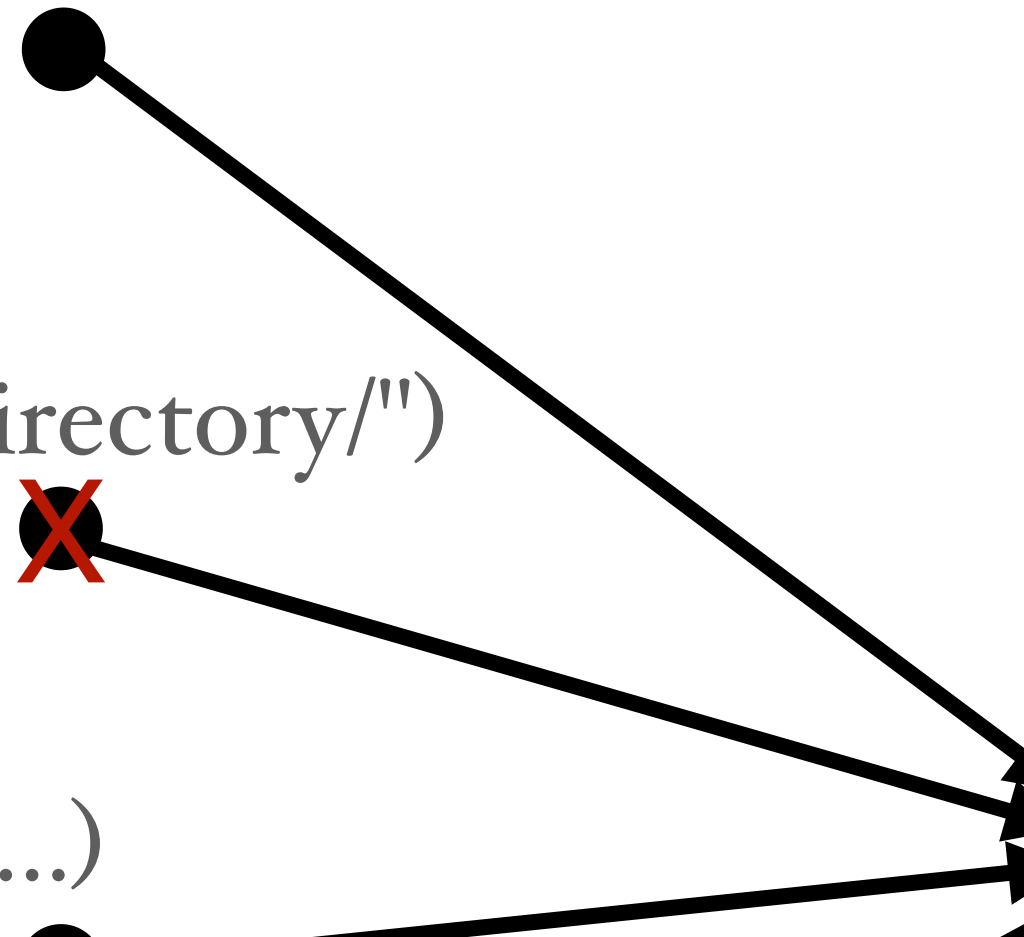
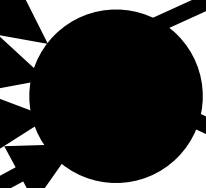
`request.queue(...)`

`input.harbor(...)`

`fallback(track_sensitive=false, ...)`

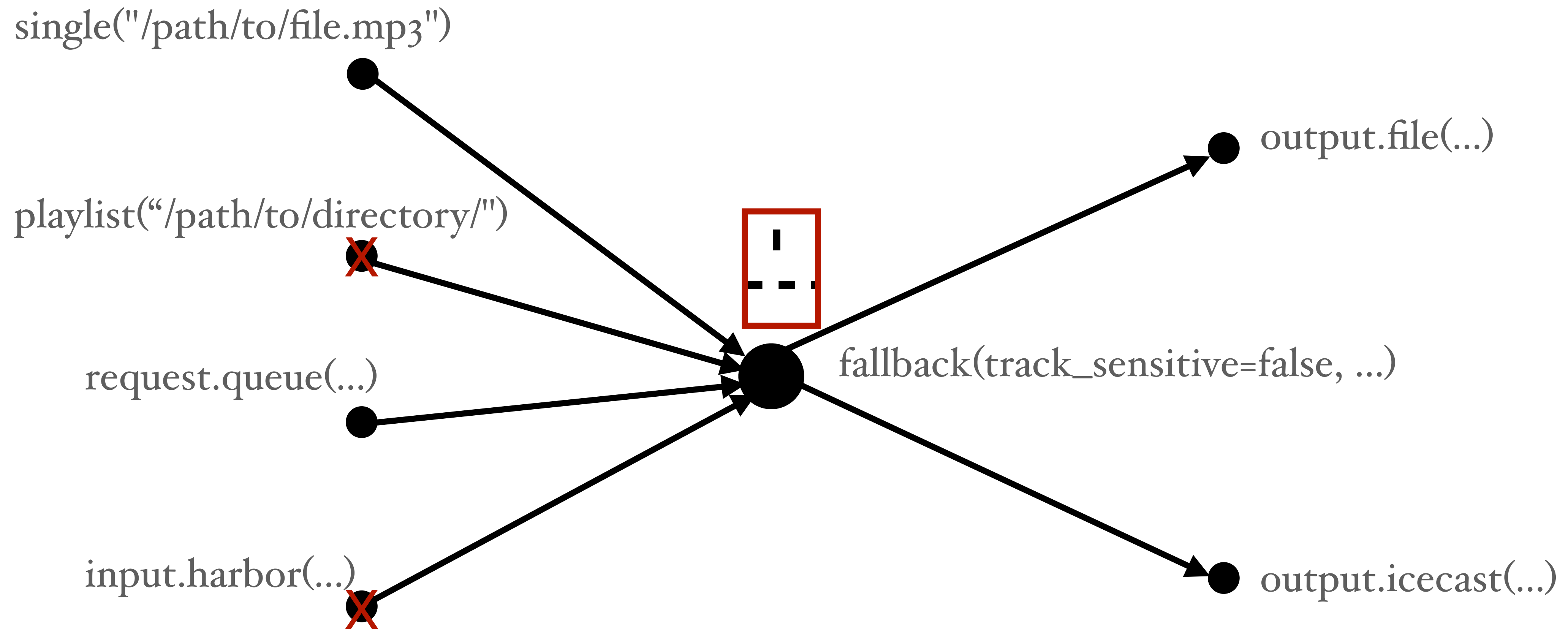
`output.file(...)`

`output.icecast(...)`



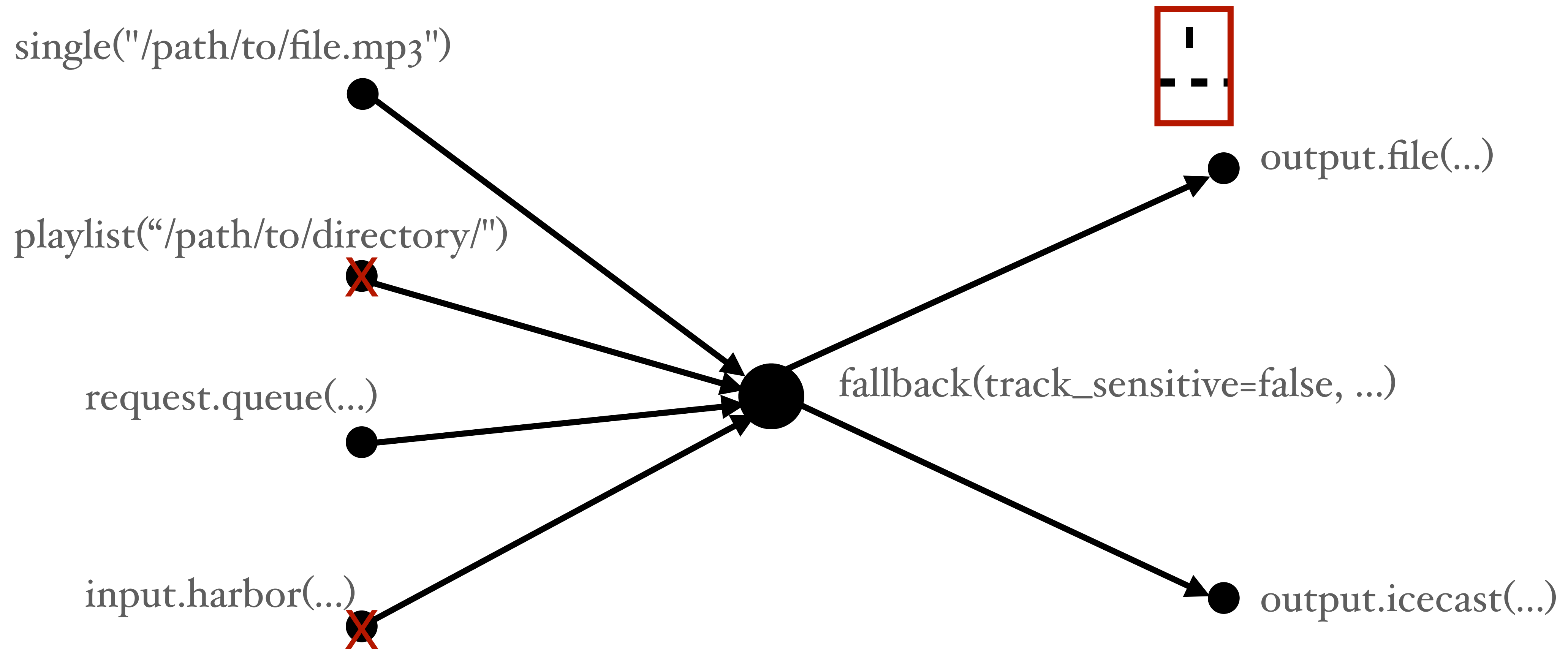
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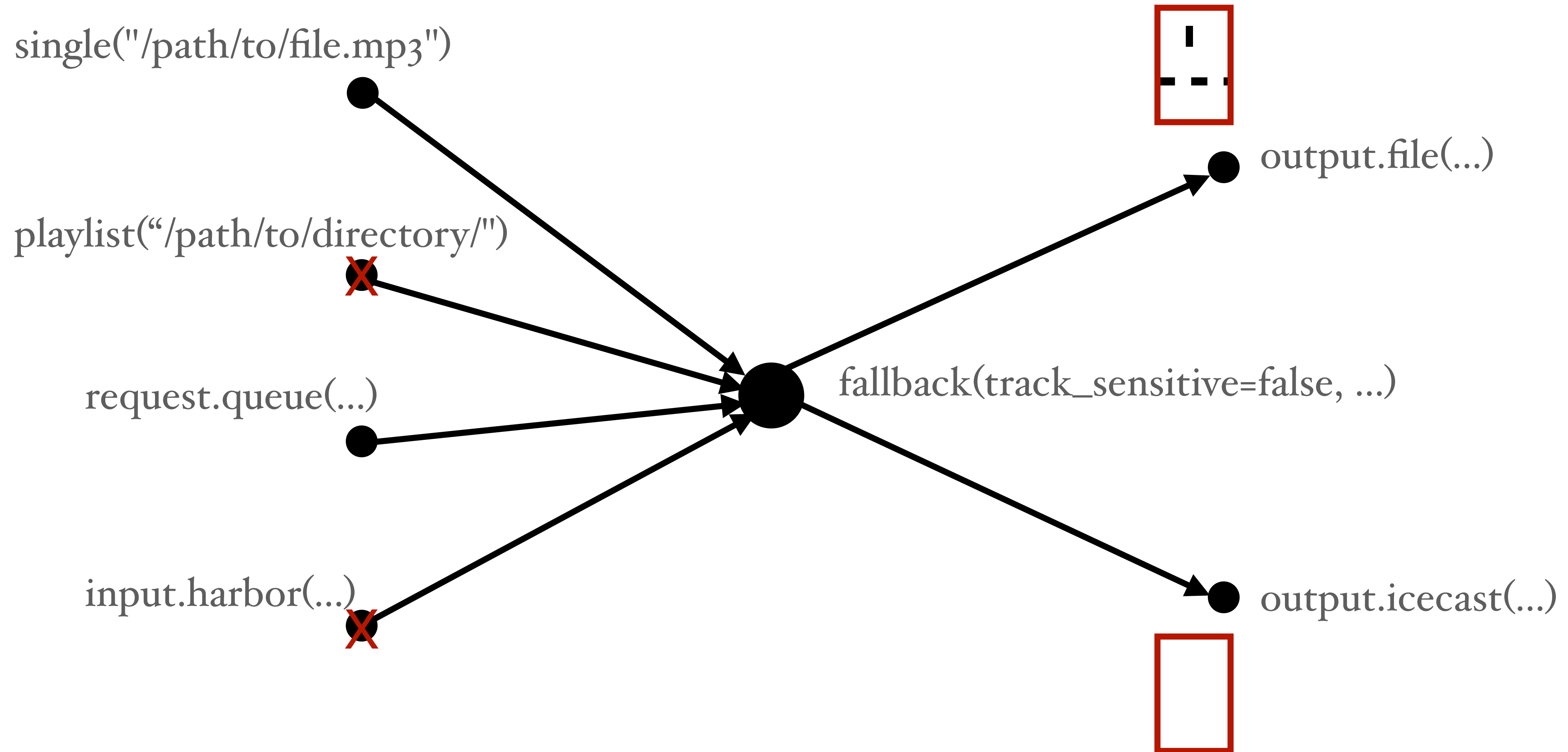
FFmpeg integration

Anything is possible!



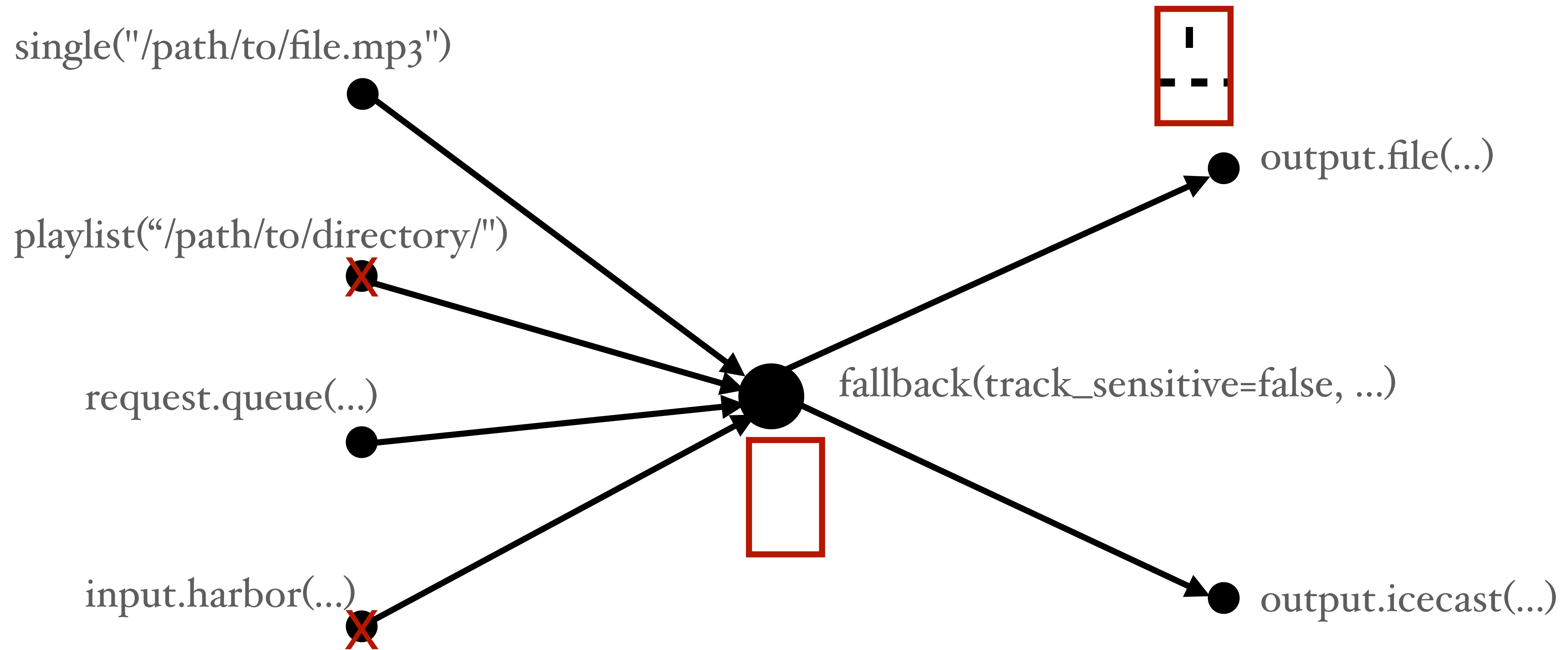
FFmpeg integration

Anything is possible!



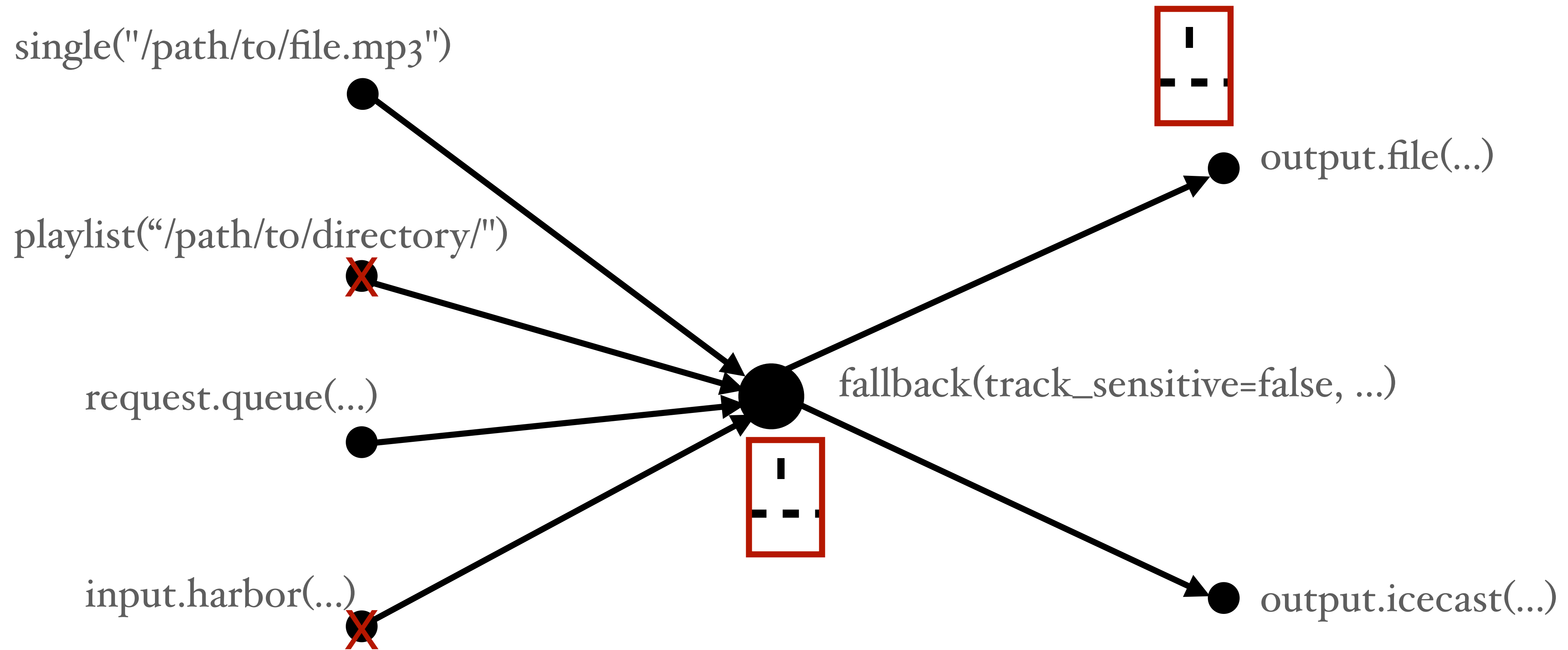
FFmpeg integration

Anything is possible!



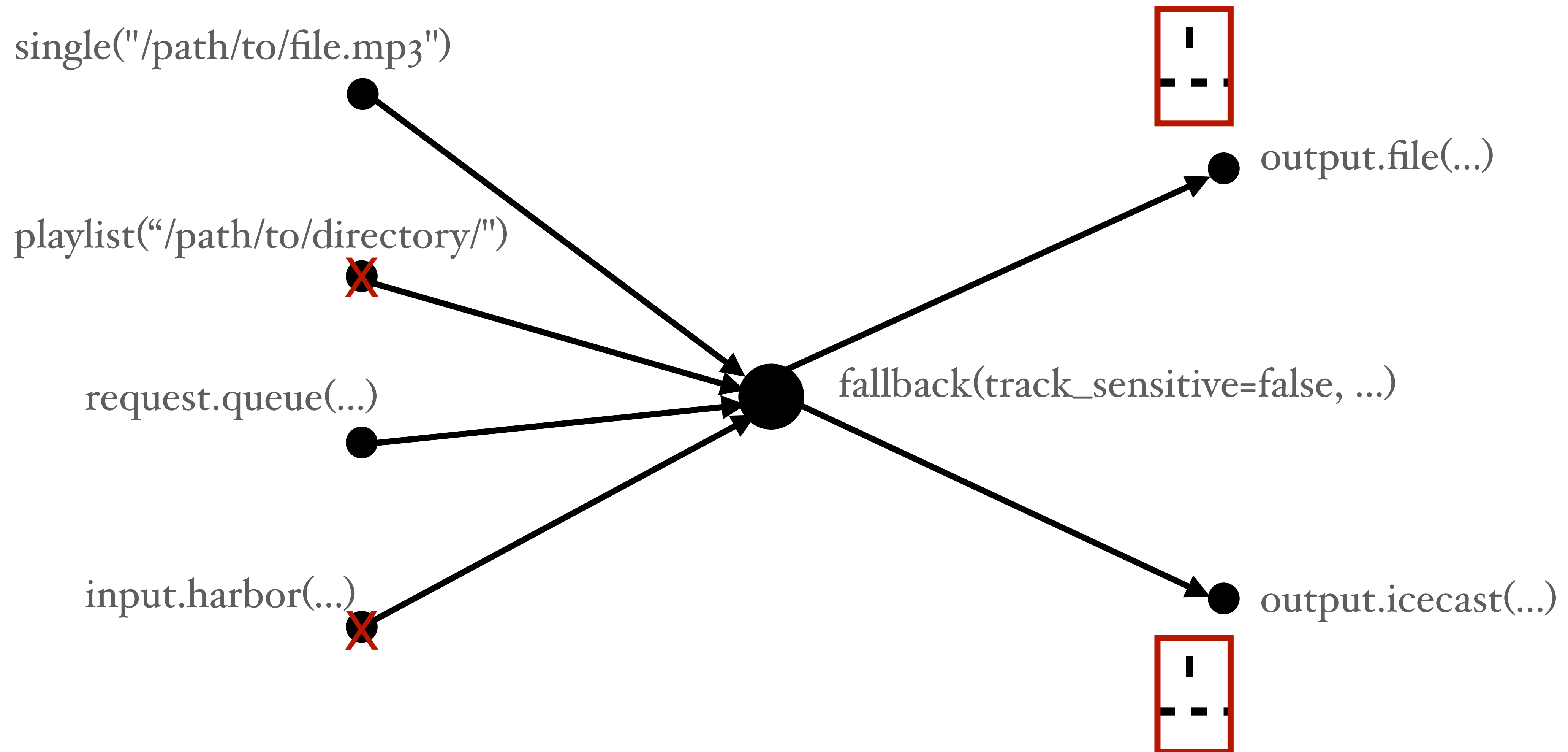
FFmpeg integration

Anything is possible!



FFmpeg integration

Anything is possible!



FFmpeg integration

Anything is possible!

Total time: t

`single("/path/to/file.mp3")`

~~`playlist("/path/to/directory/")`~~

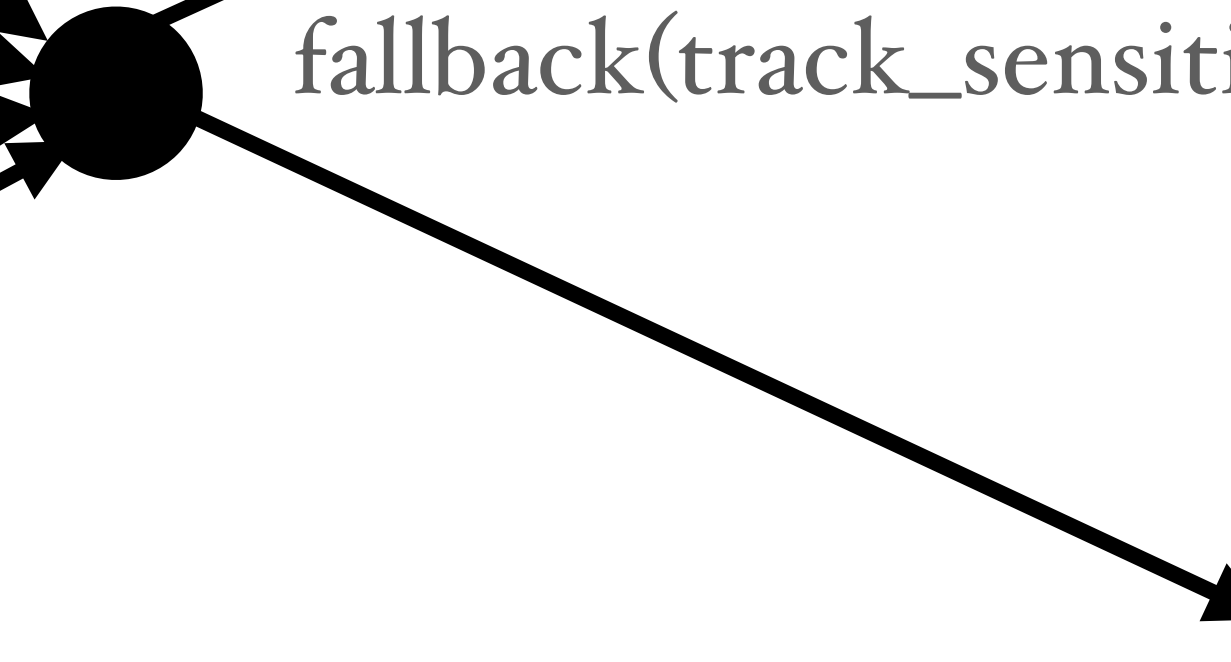
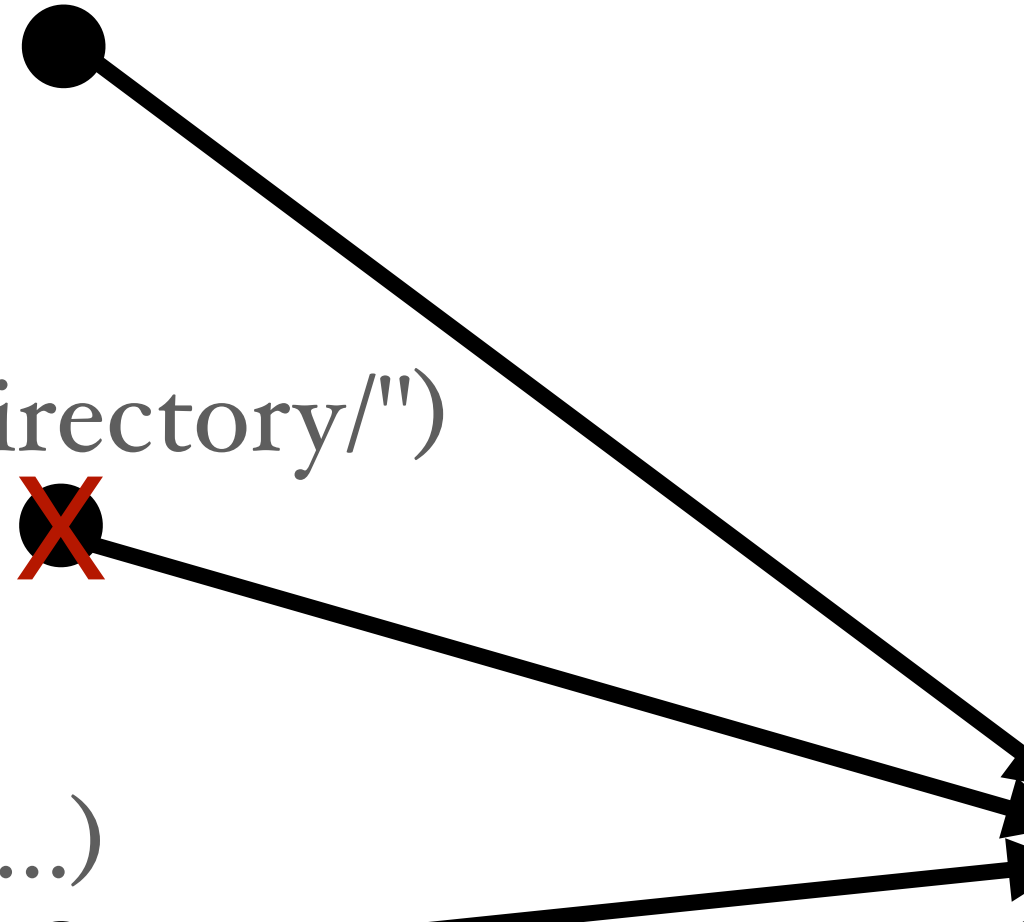
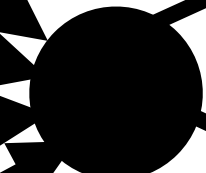
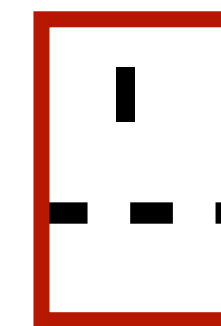
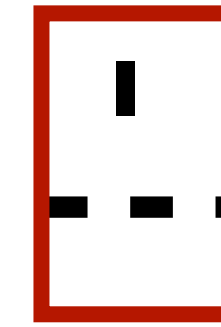
`request.queue(...)`

~~`input.harbor(...)`~~

`fallback(track_sensitive=false, ...)`

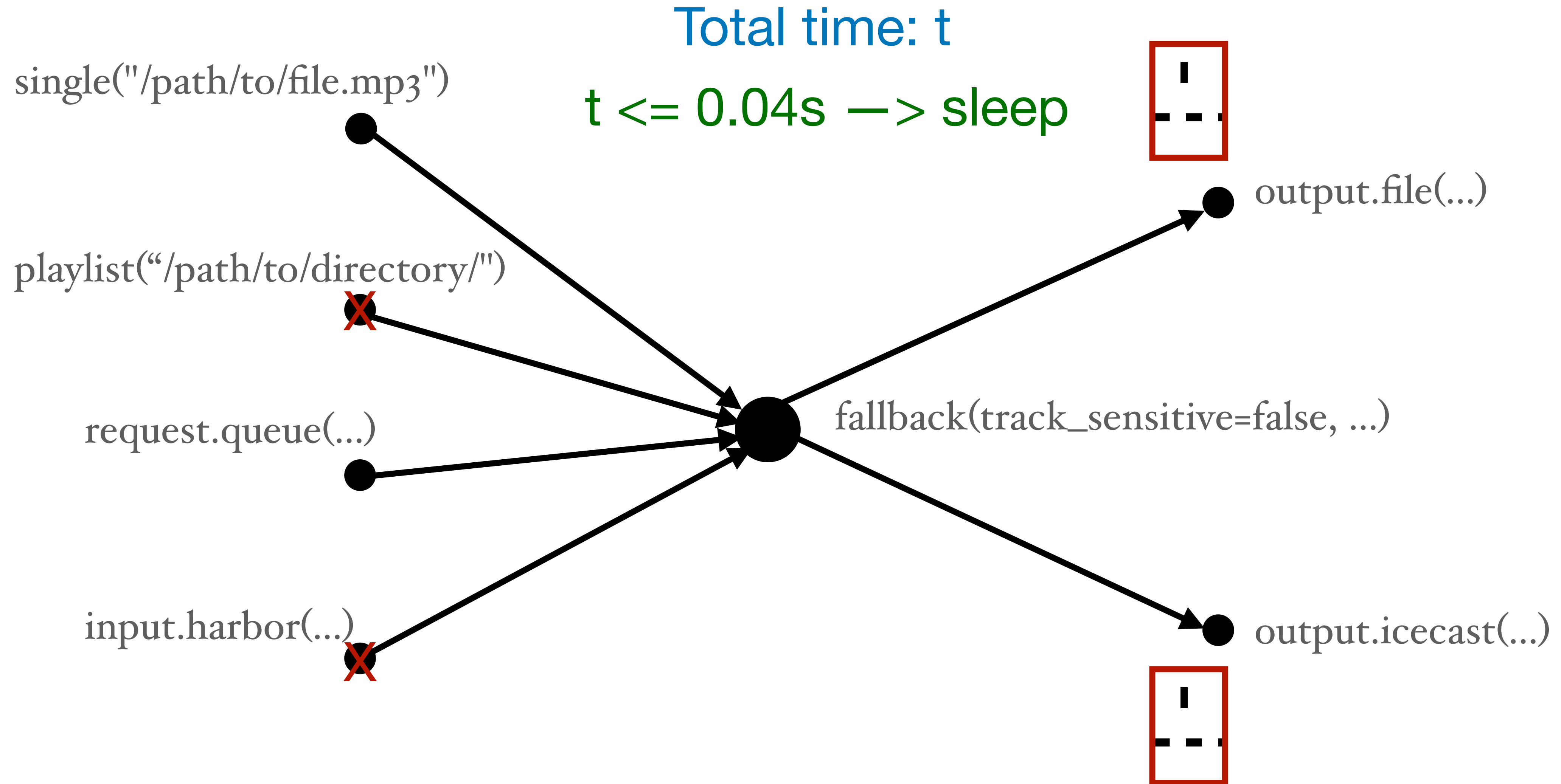
`output.file(...)`

`output.icecast(...)`



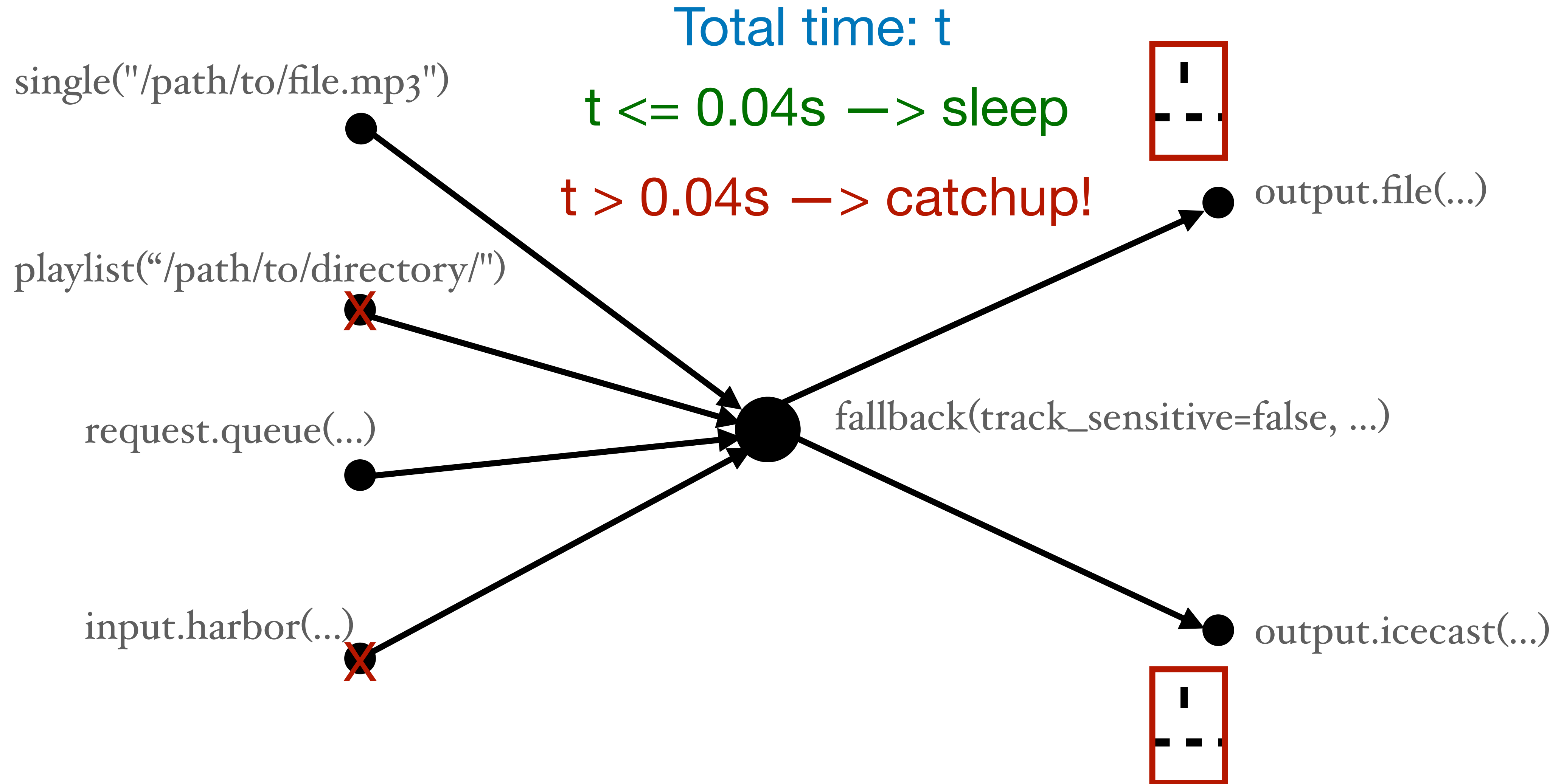
FFmpeg integration

Anything is possible!



FFmpeg integration

Anything is possible!



FFmpeg integration

Anything is possible!



FFmpeg integration

Anything is possible!

||||



FFmpeg integration

Anything is possible!

|||| ||||



FFmpeg integration

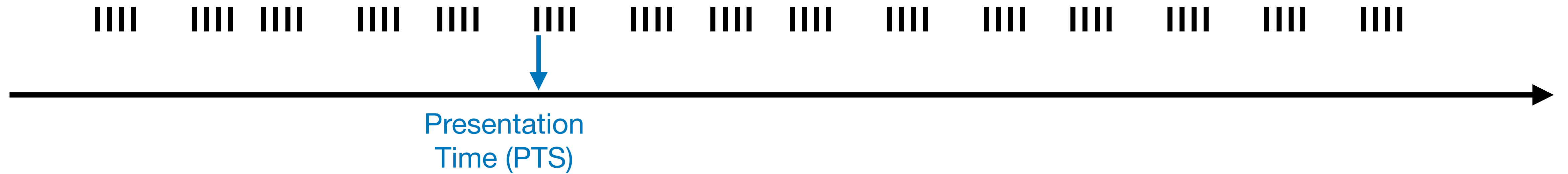
Anything is possible!

|||| | | | | | | | | | | | | | | | |



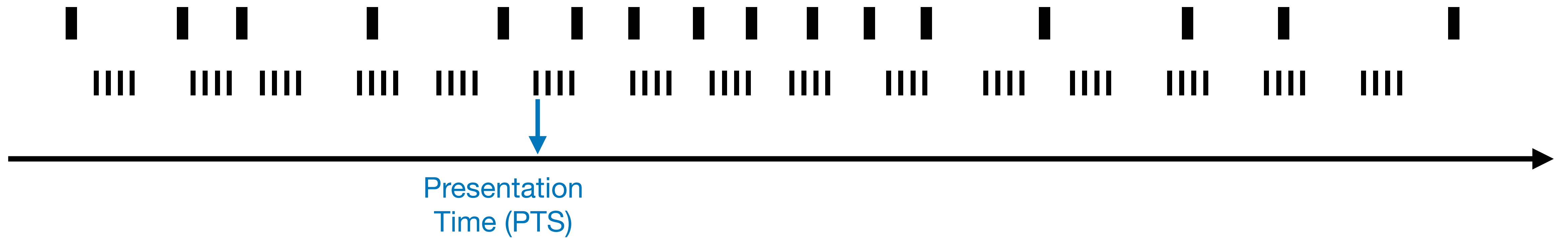
FFmpeg integration

Anything is possible!



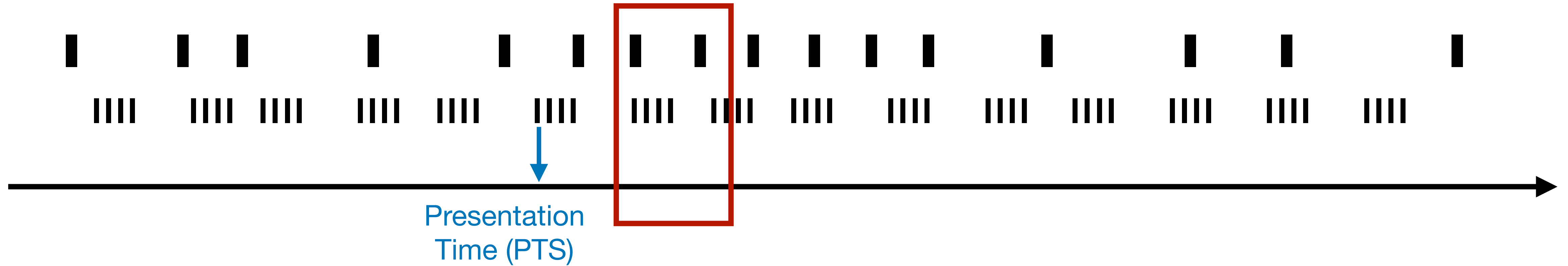
FFmpeg integration

Anything is possible!



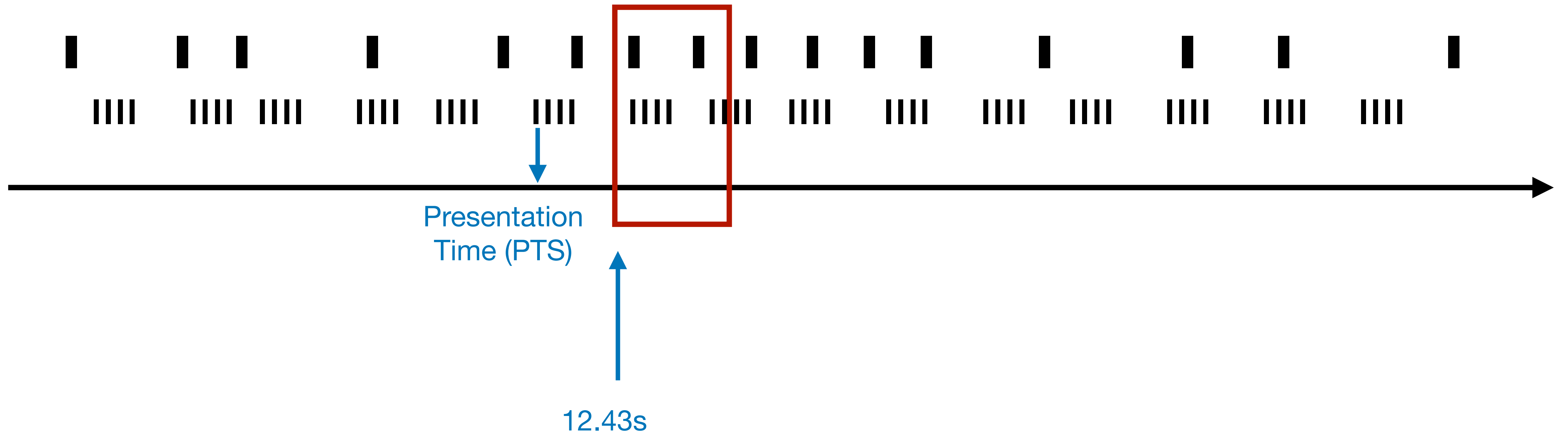
FFmpeg integration

Anything is possible!



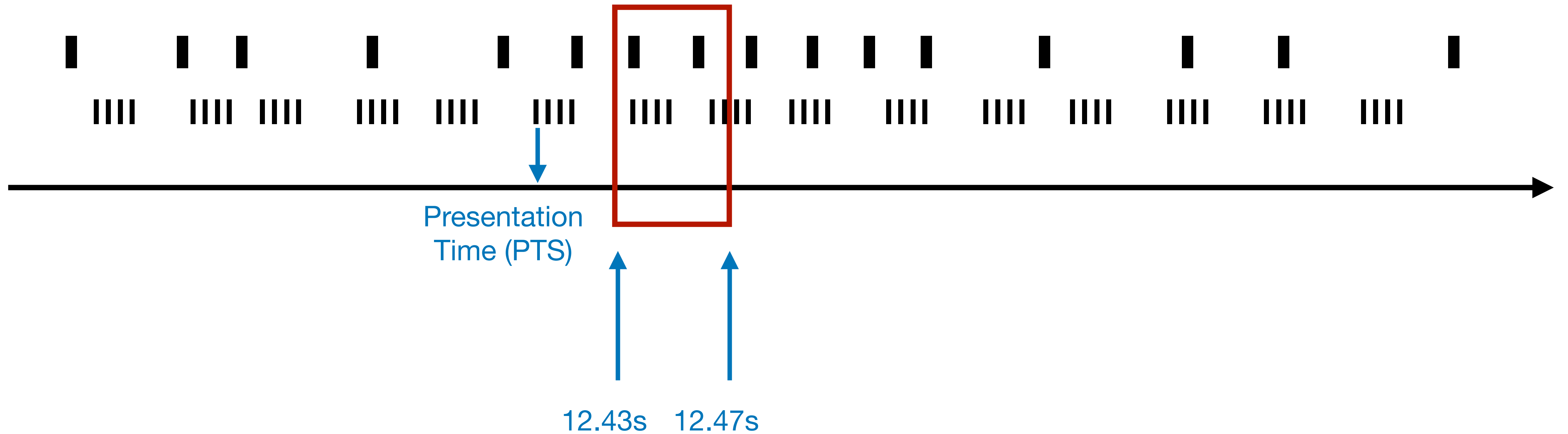
FFmpeg integration

Anything is possible!



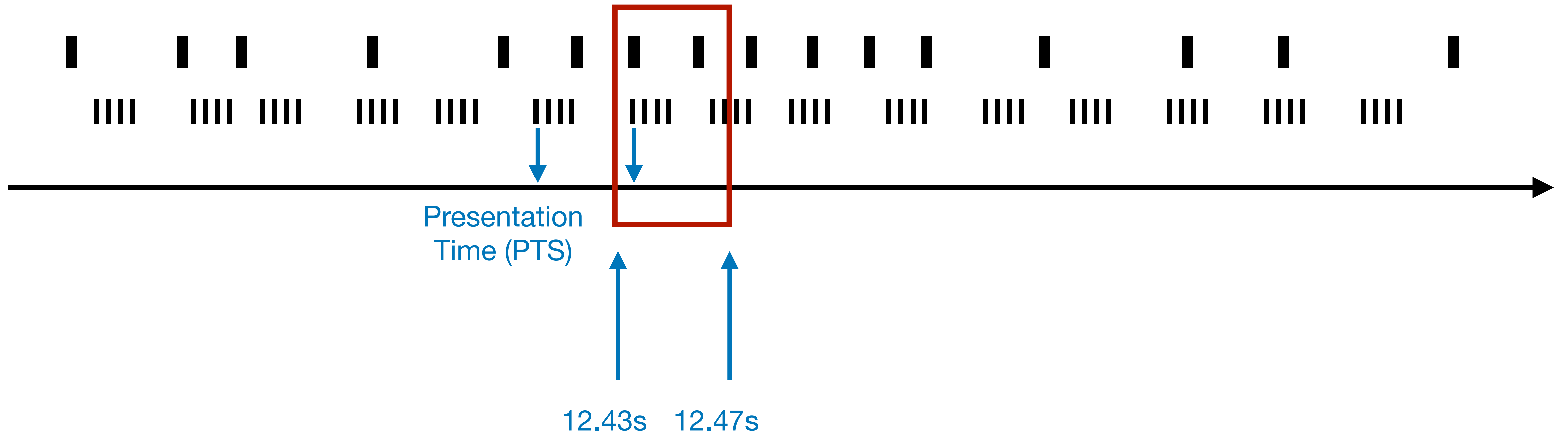
FFmpeg integration

Anything is possible!



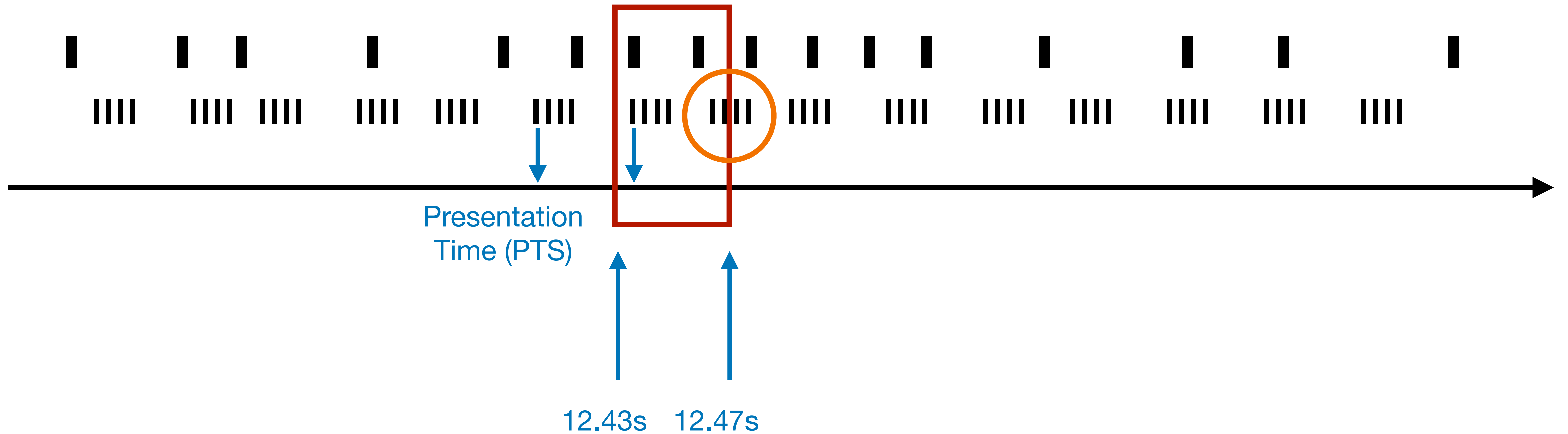
FFmpeg integration

Anything is possible!



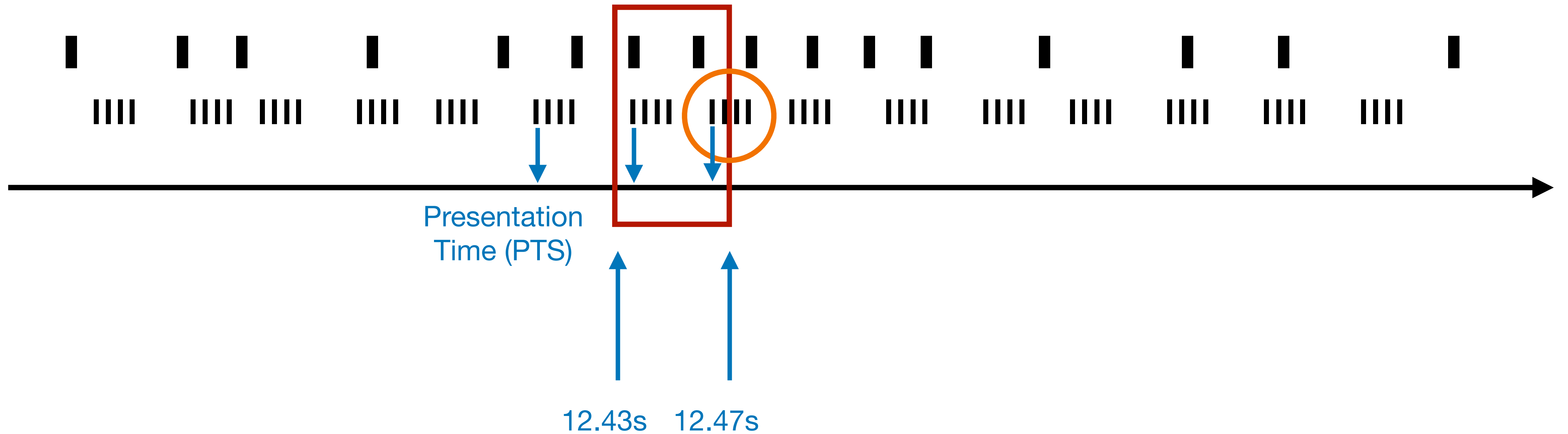
FFmpeg integration

Anything is possible!



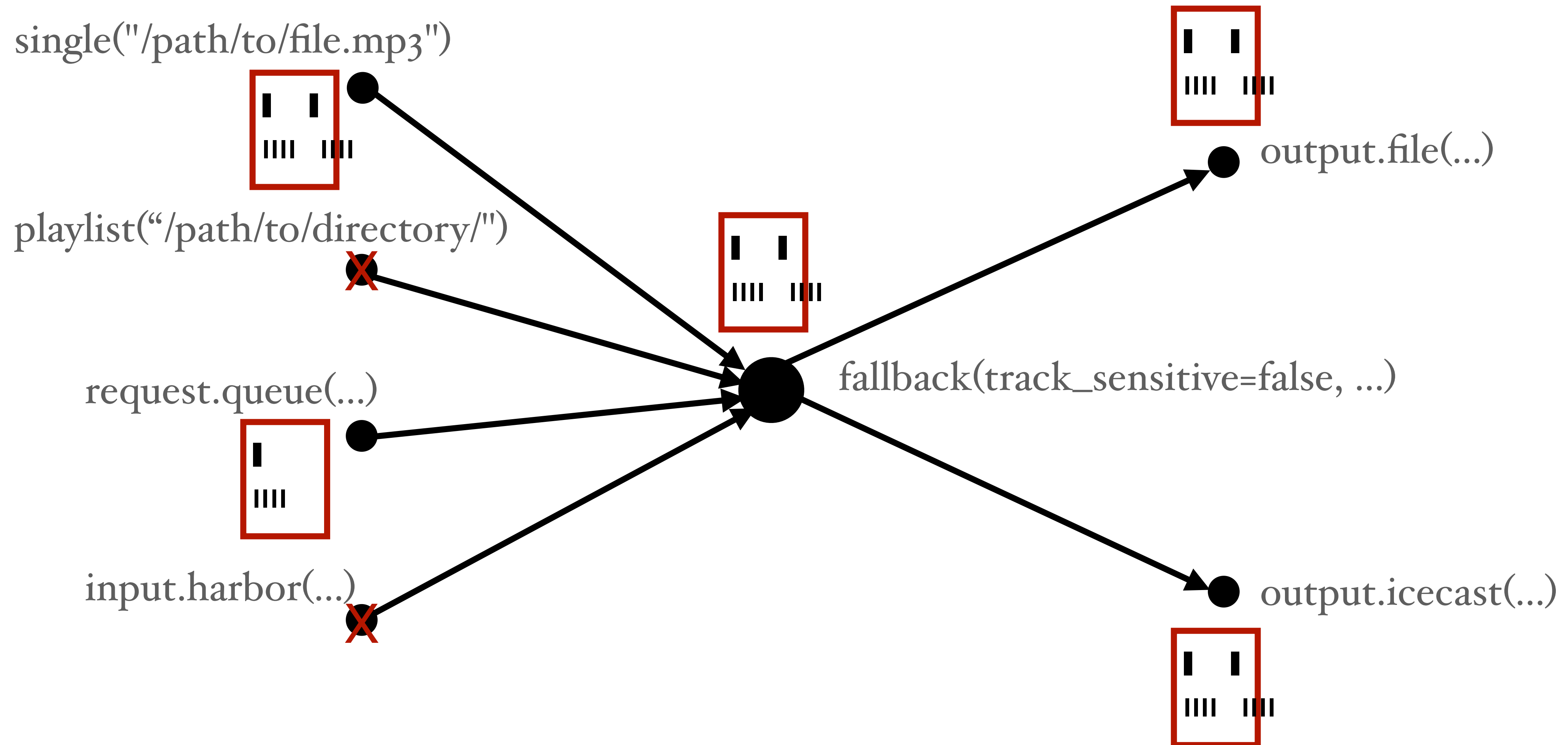
FFmpeg integration

Anything is possible!



FFmpeg integration

Anything is possible!



FFmpeg integration

Anything is possible!

FFmpeg integration

Anything is possible!

- Packet: Chunk of **encoded** data

FFmpeg integration

Anything is possible!

- Packet: Chunk of **encoded** data
 - Liquidsoap keyword: `ffmpeg.copy`

FFmpeg integration

Anything is possible!

- Packet: Chunk of **encoded** data
 - Liquidsoap keyword: `ffmpeg.copy`
- Frame: Chunk of **decoded** data

FFmpeg integration

Anything is possible!

- Packet: Chunk of **encoded** data
 - Liquidsoap keyword: `ffmpeg.copy`
- Frame: Chunk of **decoded** data
 - Liquidsoap keyword: `ffmpeg.raw`

FFmpeg integration

Anything is possible!

- Packet: Chunk of **encoded** data
 - Liquidsoap keyword: `ffmpeg.copy`
- Frame: Chunk of **decoded** data
 - Liquidsoap keyword: `ffmpeg.raw`
- Decoder

FFmpeg integration

Anything is possible!

- Packet: Chunk of **encoded** data
 - Liquidsoap keyword: `ffmpeg.copy`
- Frame: Chunk of **decoded** data
 - Liquidsoap keyword: `ffmpeg.raw`
- Decoder
- Encoder

FFmpeg integration

Anything is possible!

- Packet: Chunk of **encoded** data
 - Liquidsoap keyword: `ffmpeg.copy`
- Frame: Chunk of **decoded** data
 - Liquidsoap keyword: `ffmpeg.raw`
- Decoder
- Encoder
- Inline conversion

FFmpeg integration

Anything is possible!

- Packet: Chunk of **encoded** data
 - Liquidsoap keyword: `ffmpeg.copy`
- Frame: Chunk of **decoded** data
 - Liquidsoap keyword: `ffmpeg.raw`
- Decoder
- Encoder
- Inline conversion
- Filters

FFmpeg integration

Anything is possible!

```
%ffmpeg(  
  format="mkv",  
  %audio(  
    codec="aac",  
    channels=2,  
    ar=44100  
  ),  
  %video(  
    codec="libx264",  
    b="5m",  
  )  
)
```


FFmpeg integration

Anything is possible!

```
%ffmpeg(  
  format="mkv",  
  %audio.raw(  
    codec="aac",  
    channels=2,  
    ar=44100  
  ),  
  %video.raw(  
    codec="libx264",  
    b="5m",  
  )  
)
```

FFmpeg integration

Anything is possible!

```
%ffmpeg(  
  format="mkv",  
  %audio.copy,  
  %video.copy  
)
```

FFmpeg integration

Anything is possible!

```
%ffmpeg(  
  format="mkv",  
  %audio.copy,  
  %video.copy  
)
```

```
s = input.harbor("mount")  
  
output.icecast(  
  %ffmpeg(format="mp3", %audio.copy),  
  server="host1",  
  ...,  
  s  
)
```

FFmpeg integration

Anything is possible!

```
%ffmpeg(  
  format="mkv",  
  %audio.copy,  
  %video.copy  
)
```

```
s = input.harbor("mount")
```

```
output.icecast(  
  %ffmpeg(format="mp3", %audio.copy),  
  server="host1",  
  ...,  
  s  
)
```

```
output.icecast(  
  %ffmpeg(format="mkv", %audio.copy, %video.copy),  
  server="host2",  
  ...,  
  s  
)
```

FFmpeg integration

Anything is possible!

```
%ffmpeg(  
  format="mkv",  
  %audio.copy,  
  %video.copy  
)
```

```
s = input.harbor("mount")
```

```
output.icecast(  
  %ffmpeg(format="mp3", %audio.copy),  
  server="host1",  
  ...,  
  s  
)
```

```
output.file.hls(  
  streams=[  
    ("mp3", %ffmpeg(format="mp3", %audio.copy))  
  ],  
  ...,  
  s  
)
```

FFmpeg integration

Anything is possible!

```
source(  
  audio=ffmpeg.audio.copy('a'),  
  video=none,  
  midi=none)
```

FFmpeg integration

Anything is possible!

```
source(  
  audio=ffmpeg.audio.copy('a'),  
  video=none,  
  midi=none)
```

```
[decoder.ffmpeg:4] ffmpeg recognizes "/tmp/bla.mp4" as:  
  audio: {codec: aac, 48000Hz, 2 channel(s)},  
  video: {codec: h264, 1920x1080, yuv420p}
```

FFmpeg integration

Anything is possible!

```
source(  
  audio=ffmpeg.audio.copy('a'),  
  video=none,  
  midi=none)
```

```
[decoder.ffmpeg:4] ffmpeg recognizes "/tmp/bla.mp4" as:  
  audio: {codec: aac, 48000Hz, 2 channel(s)},  
  video: {codec: h264, 1920x1080, yuv420p}
```

```
[/tmp/bla(dot)mp4:4] Content type is {  
  audio=ffmpeg.audio.copy(  
    sample_rate=48000,sample_format=fltp,channel_layout="stereo",codec="aac"  
  ),  
  video=none,midi=none  
}
```


FFmpeg integration

Anything is possible!

```
liquidsoap -h ffmpeg.encode.audio_video
```

Convert a source's content

```
Type: (  
  ?id : string,  
  ?buffer : float,  
  ?max : float,  
  format(audio=pcm('a), video=yuva420p('b), midi=none),  
  source(audio=pcm('a), video=yuva420p('b), midi=none)  
) ->  
  source(audio=ffmpeg.audio.copy('e), video=ffmpeg.video.copy('f), midi=none)
```

FFmpeg integration

Anything is possible!

```
s = (...)
```

```
s = ffmpeg.encode.audio(  
    %ffmpeg(  
        format="mp3",  
        %audio(codec="libmp3lame", b="128k")  
    )  
)
```

FFmpeg integration

Anything is possible!

```
s = (...)
```

```
s = ffmpeg.encode.audio(  
    %ffmpeg(  
        format="mp3",  
        %audio(codec="libmp3lame", b="128k")  
    )  
)
```

```
output.icecast(  
    %ffmpeg(format="mp3", %audio.copy)  
    server="host1",  
    ...,  
    s  
)
```

```
output.icecast(  
    %ffmpeg(format="mp3", %audio.copy)  
    server="host2",  
    ...,  
    s  
)
```

FFmpeg integration

Anything is possible!

```
s = (...)
```

```
s = ffmpeg.encode.audio_video(  
    %ffmpeg(  
        format="mkv",  
        %audio(  
            codec="aac",  
            b="128k",  
        ),  
        %video(  
            codec="libx264",  
            b="5M"  
        )  
    )  
)  
)
```

FFmpeg integration

Anything is possible!

```
s = (...)
```

```
s = ffmpeg.encode.audio_video(  
    %ffmpeg(  
        format="mkv",  
        %audio(  
            codec="aac",  
            b="128k",  
        ),  
        %video(  
            codec="libx264",  
            b="5M"  
        )  
    )  
)  
)
```

```
mpegts = %ffmpeg(format="mpegts", %audio.copy, %video.copy)
```

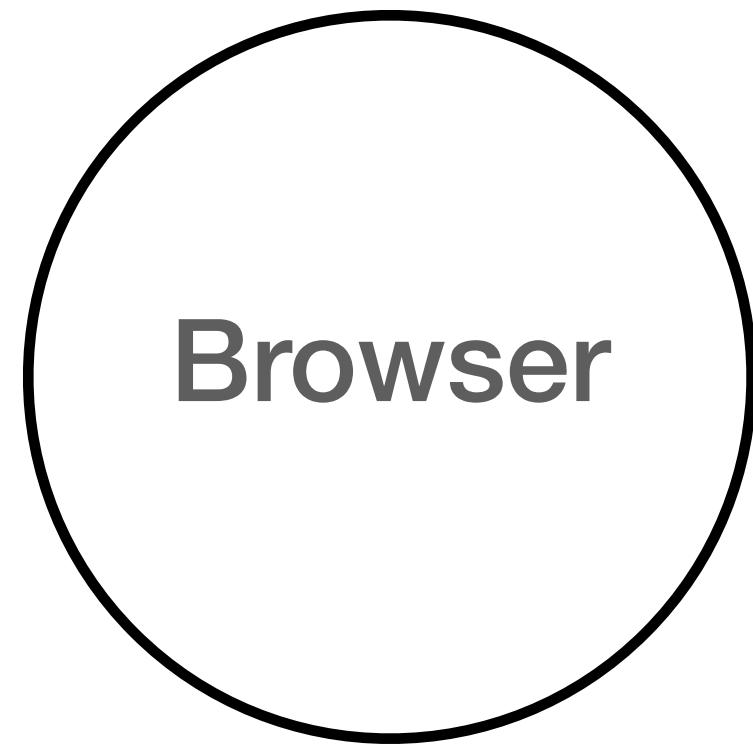
```
mp4 = %ffmpeg(  
    format="mp4",  
    movflags="+dash+skip_sidx+skip_trailer+frag_custom",  
    frag_duration=10,  
    %audio.copy, %video.copy  
)
```

```
streams = [  
    ("mpegts", mpegts),  
    ("mp4", mp4)  
]
```

```
output.file.hls(streams, ..., s)
```

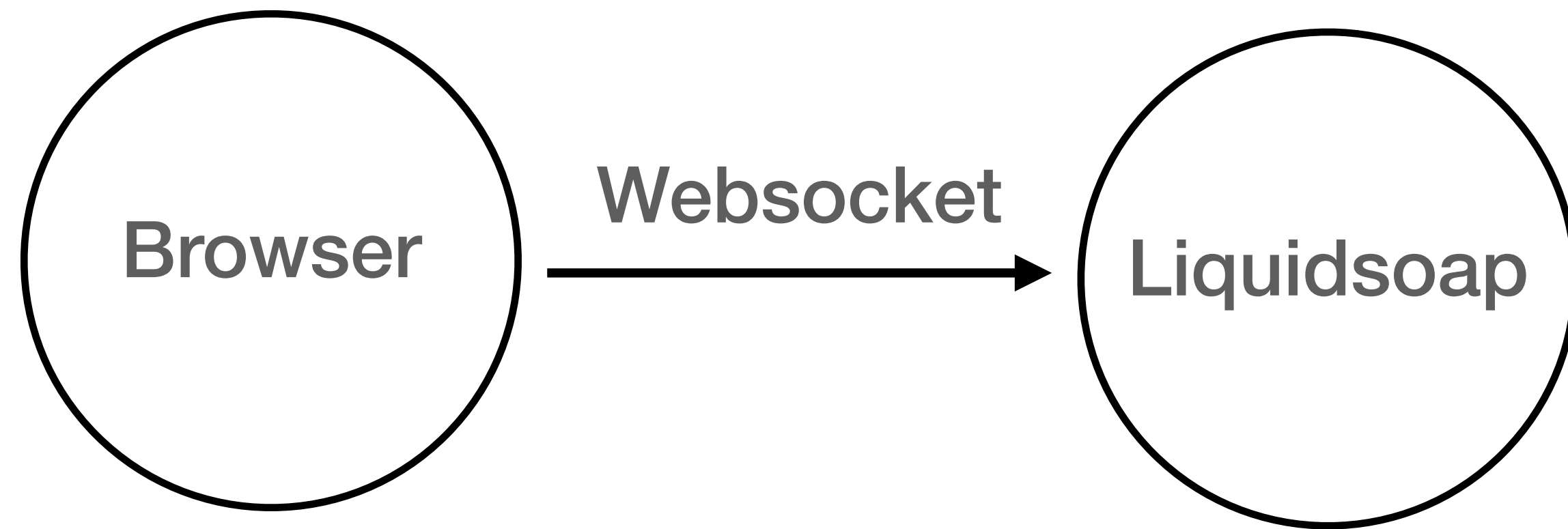
FFmpeg integration

Anything is possible!



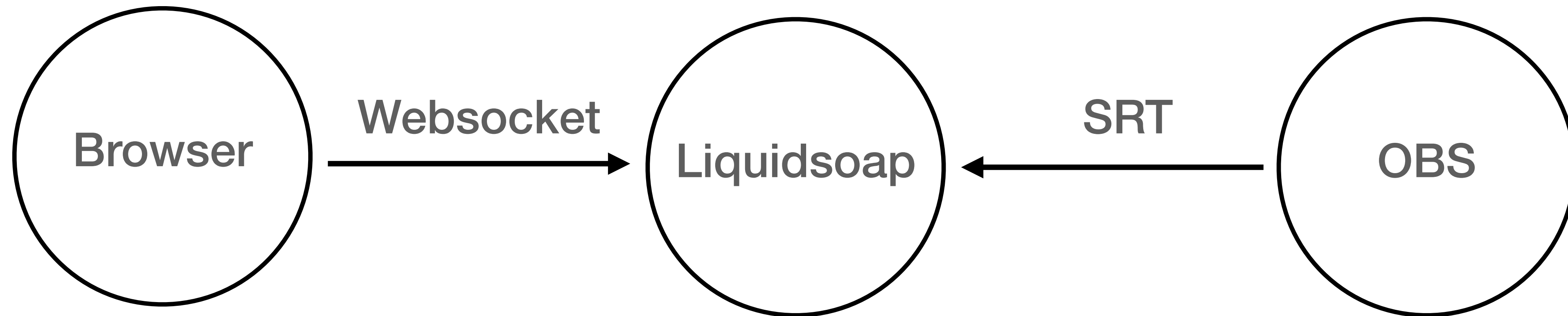
FFmpeg integration

Anything is possible!



FFmpeg integration

Anything is possible!



FFmpeg integration

Anything is possible!

The screenshot shows a web browser window titled "Webcaster Client" at the URL "localhost:8080". The interface is divided into several sections:

- Video:** A live video feed of a man with curly hair. Below it is a checkbox for "Enable camera" (checked), a "Stop streaming" button, and a "CUE" button. There are also tabs for "Settings" and "Metadata".
- Format:** A dropdown menu set to "Opus audio/h264 video".
- Video Bitrate (MB/s):** A dropdown menu set to "2.5".
- Samplerate:** A dropdown menu set to "44100".
- Audio Bitrate (kB/s):** A dropdown menu set to "128".
- Channels:** Radio buttons for "Stereo" (selected) and "Mono".
- Playlist 1:** A control panel with a volume slider, playback buttons (play, previous, next, stop), and a "CUE" button. A progress bar shows "00:11 / 03:35". Below the progress bar is a table of playlist items:

Index	Title	Artist	Duration
1	Chocolate Jesus	Unknown Artist	03:35

Below the table are controls for "Add files to playlist": a "Choose Files" button (with "No file chosen" text), a checked "Play Through" checkbox, and an unchecked "Repeat playlist" checkbox.
- Mixer:** A control panel with a volume slider and a "Microphone" section with a "CUE" button and a dropdown menu set to "Default - MacBook Pro Microph...".
- Playlist 2:** A control panel with a volume slider, playback buttons (play, previous, next, stop), and a "CUE" button. Below the buttons are controls for "Add files to playlist": a "Choose Files" button (with "No file chosen" text), a checked "Play Through" checkbox, and an unchecked "Repeat playlist" checkbox.

FFmpeg integration

Anything is possible!

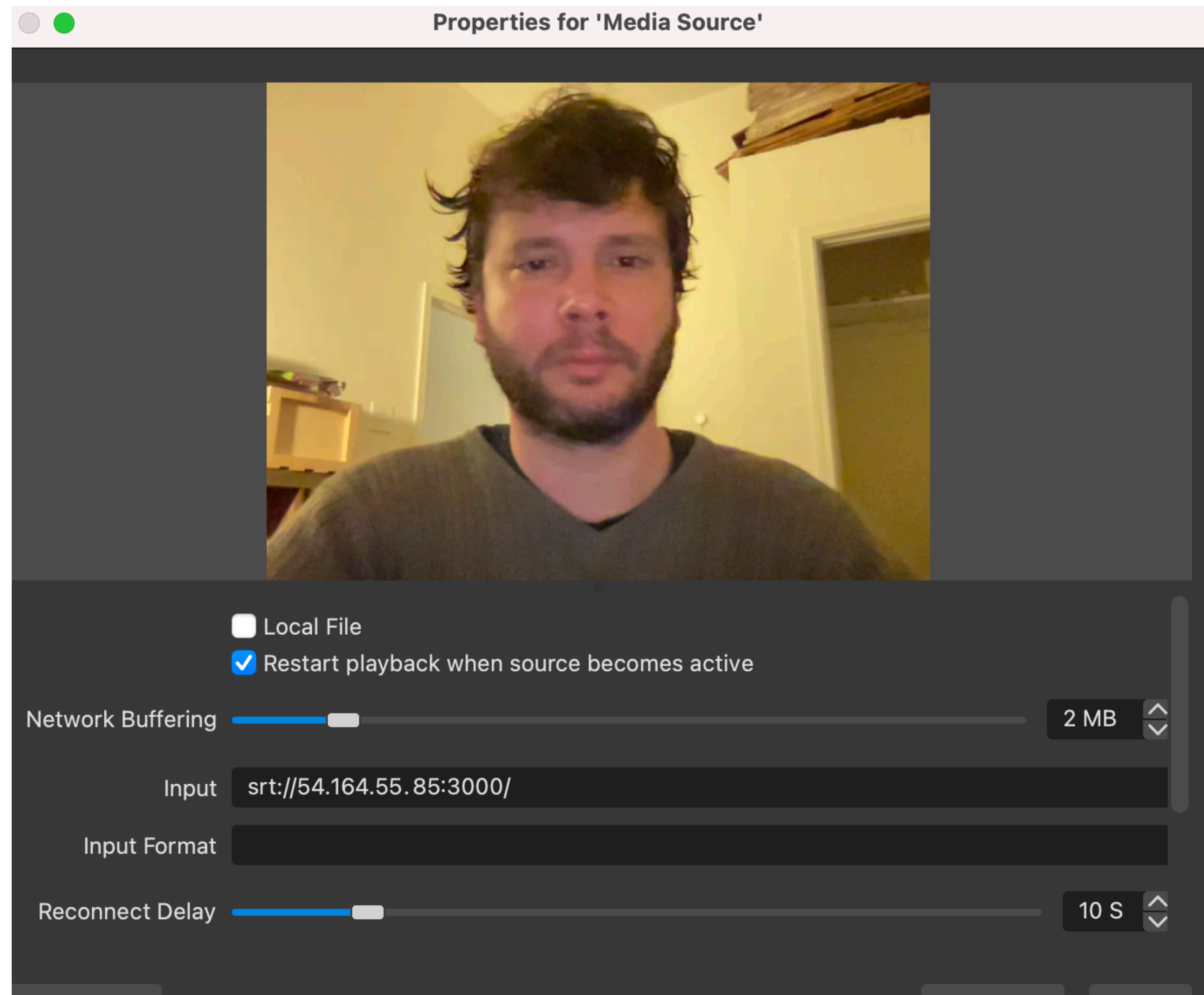
```
s = input.harbor(port=8000, "mount")
```

```
e = %ffmpeg(format="webm",%audio.copy, %video.copy)
```

```
output.srt(mode="listener", port=3000, e, fallible=true, s)
```

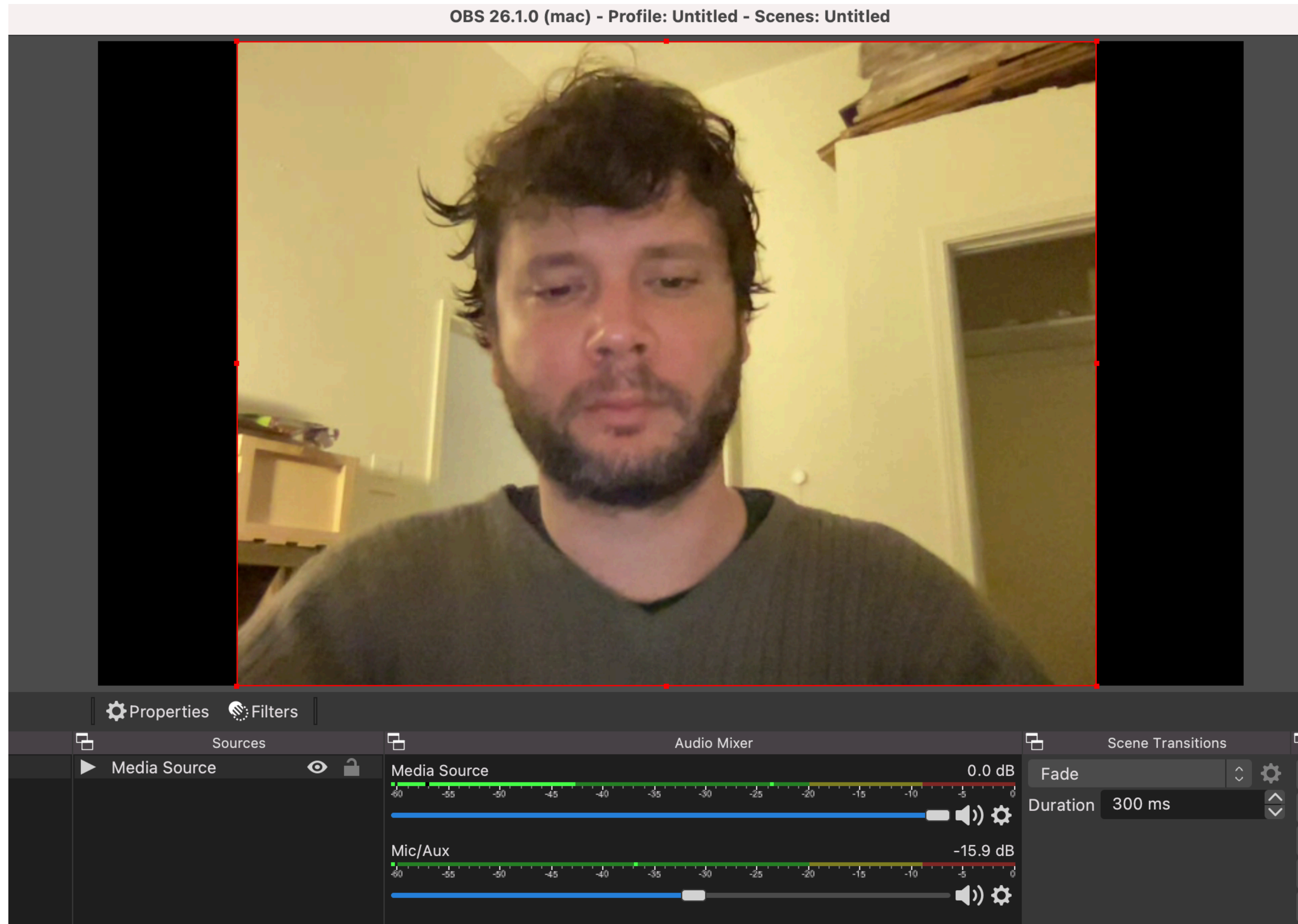
FFmpeg integration

Anything is possible!



FFmpeg integration

Anything is possible!



TODO

What's next?

TODO

What's next?

- Cleanup, fix bugs

TODO

What's next?

- Cleanup, fix bugs
- Re-organize the video API with modules

TODO

What's next?

- Cleanup, fix bugs
- Re-organize the video API with modules
- Complete overhaul of the documentation

TODO

What's next?

- Cleanup, fix bugs
- Re-organize the video API with modules
- Complete overhaul of the documentation
- RTMP input?

TODO

What's next?

- Cleanup, fix bugs
- Re-organize the video API with modules
- Complete overhaul of the documentation
- RTMP input?
- Implement awesome features:

TODO

What's next?

- Cleanup, fix bugs
- Re-organize the video API with modules
- Complete overhaul of the documentation
- RTMP input?
- Implement awesome features:
 - SRT HEVC server

TODO

What's next?

- Cleanup, fix bugs
- Re-organize the video API with modules
- Complete overhaul of the documentation
- RTMP input?
- Implement awesome features:
 - SRT HEVC server
 - ...