

GstPriQueue

Erlend Graff (egraff) – Pexip R&D

8th GStreamer Conference

21 October 2017

Prague, Czech Republic

Jitter buffer and timers

```
gst_rtp_jitter_buffer_chain(...)  
{  
    /* acquire jitter buffer lock */  
  
    /* do stuff (schedule timers) */  
  
    /* release jitter buffer lock */  
}
```

Timer thread:

```
    /* acquire jitter buffer lock */  
  
    /* iterate through all timers  
     * to find the “next” one  
     */  
  
    /* process “next” timer */  
  
    /* release jitter buffer lock */
```

Jitter buffer and timers

```
gst_rtp_jitter_buffer_chain(...)  
{  
    /* acquire jitter buffer lock */  
  
    /* do stuff (schedule timers) */  
  
    /* release jitter buffer lock */  
}
```

Timer thread:

```
/* acquire jitter buffer lock */  
  
/* iterate through all timers  
 * to find the “next” one  
 */  
  
/* process “next” timer */  
  
/* release jitter buffer lock */
```



Could we do better™?

Priority queues to the rescue?

Make the common case fast!

Insert element

Get element with “highest priority”

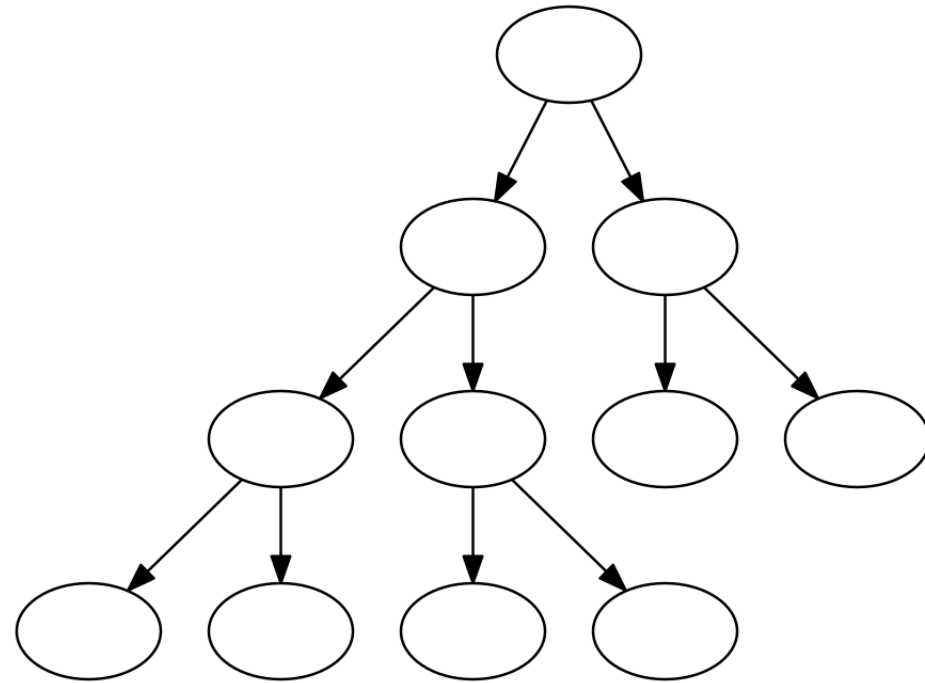
Priority queues to the rescue?

Make the common case fast!

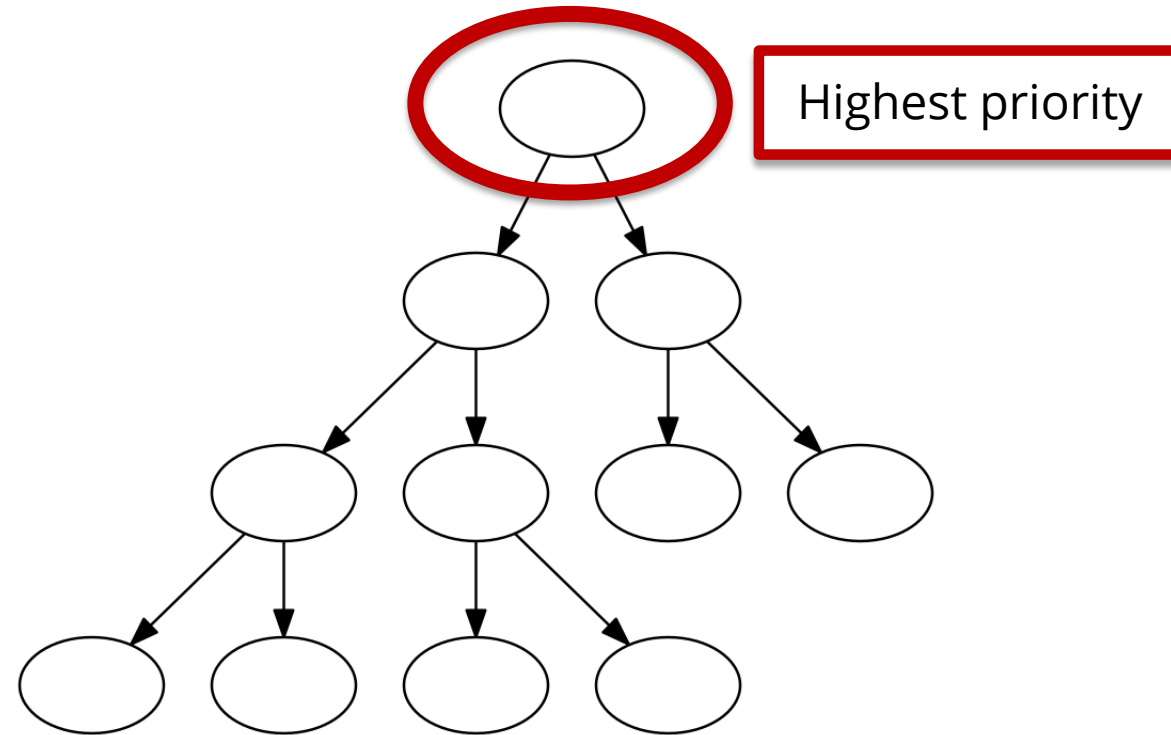
Insert element $O(1)$

Get element with "highest priority" $O(\log n)$

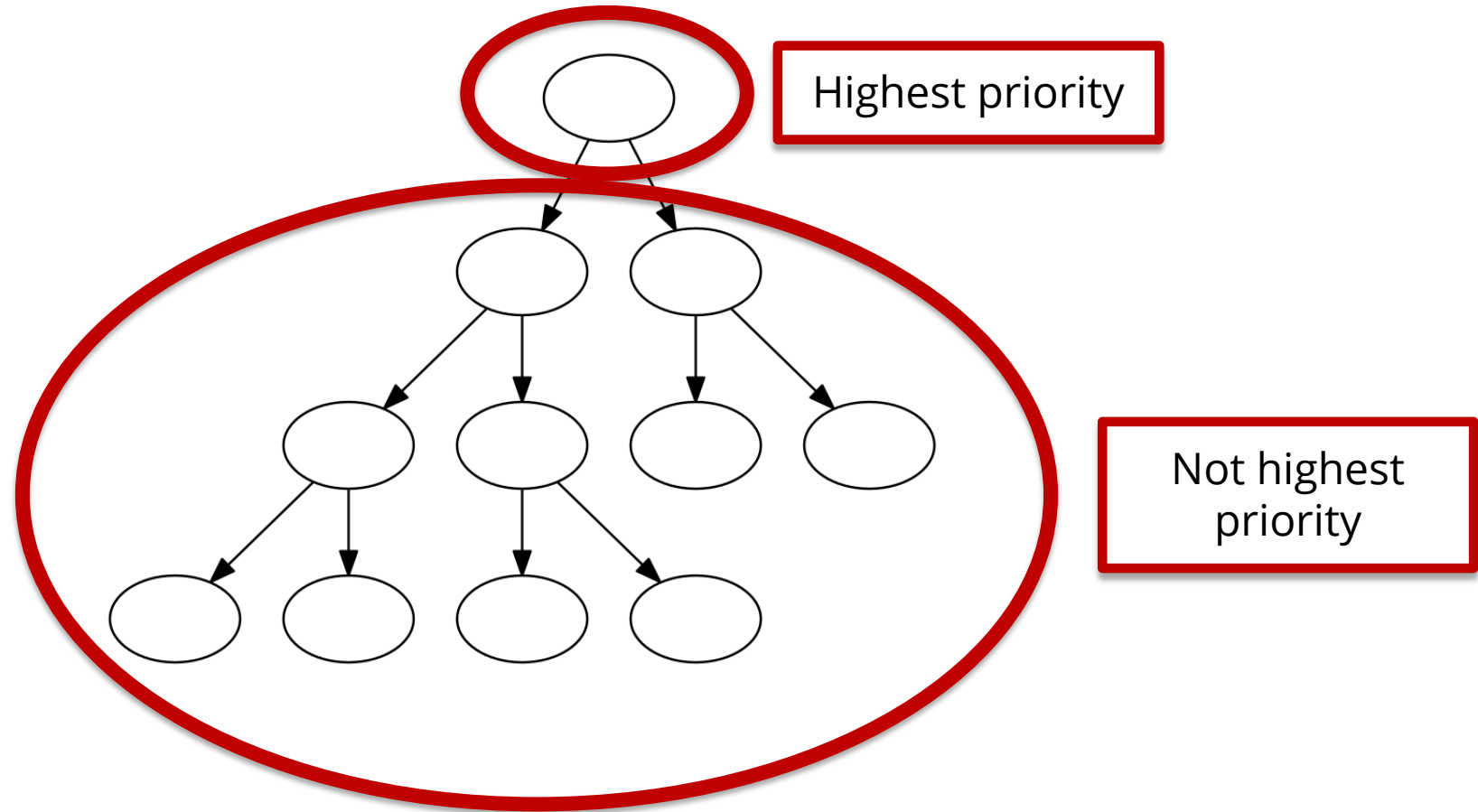
Priority queues to the rescue?



Priority queues to the rescue?



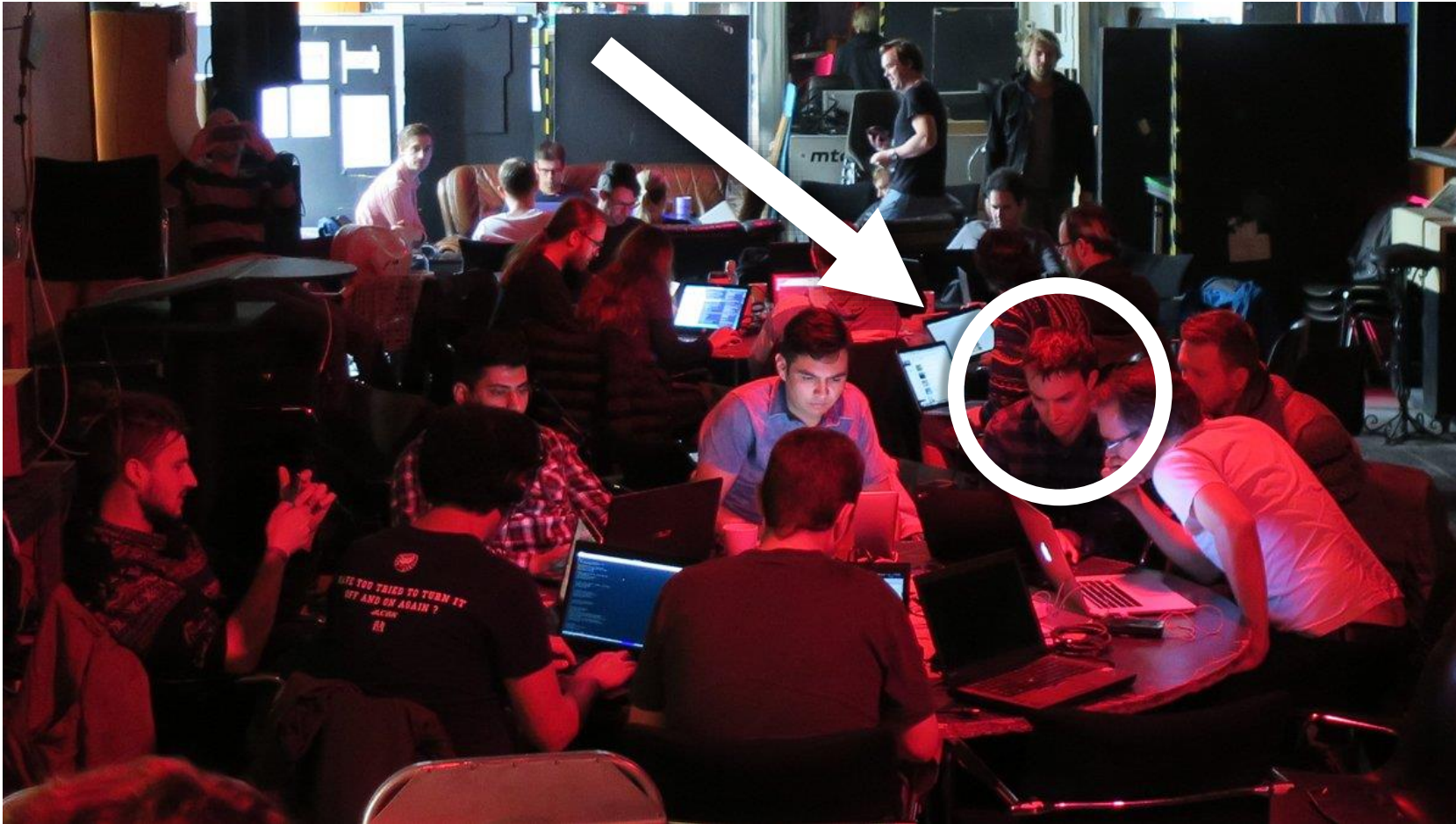
Priority queues to the rescue?



GstPriQueue



GstPriQueue



Jitter buffer and timers

```
gst_rtp_jitter_buffer_chain(...)  
{  
    /* acquire jitter buffer lock */  
  
    /* do stuff (schedule timers) */  
  
    /* release jitter buffer lock */  
}
```

Timer thread:

```
/* acquire jitter buffer lock */  
  
/* iterate through all timers  
 * to find the “next” one  
 */  
  
/* process “next” timer */  
  
/* release jitter buffer lock */
```

Jitter buffer and timers

```
gst_rtp_jitter_buffer_chain(...)  
{  
    /* acquire jitter buffer lock */  
  
    /* do stuff (schedule timers) */  
  
    /* release jitter buffer lock */  
}
```

Timer thread:

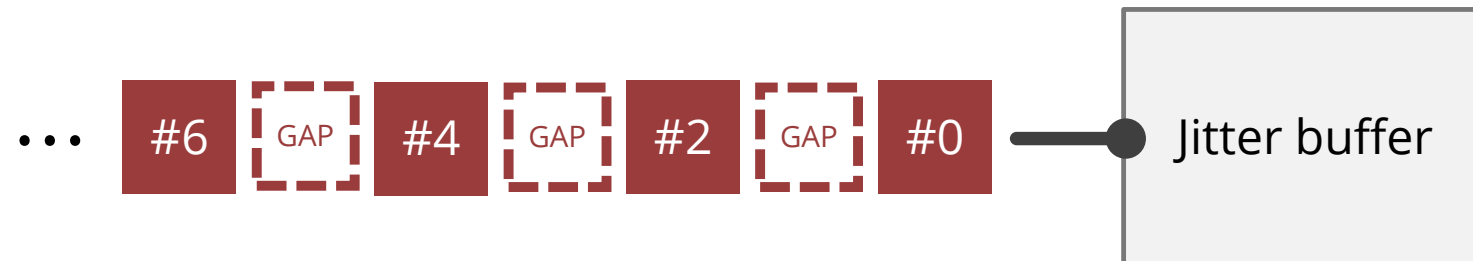
```
    /* acquire jitter buffer lock */  
  
    /* iterate through all timers  
    /* Get timer with "highest priority" */  
    */  
  
    /* process "next" timer */  
  
    /* release jitter buffer lock */
```

Does it work™?

Baseline



Evil scenario



Some numbahs

	Number of buffers pushed
Baseline	~30000
With gaps and RTX - GArray	~10000
With gaps and RTX - GstPriQueue	~20000



Get it here!

<https://github.com/pexip/gstreamer/commits/gstpriqueue>