

# Callbacks



This page refers to **job-specific** callbacks. For callbacks that are applied to all jobs see the documentation for [Universal Callbacks](#)

A **callback** is Qube's mechanism to allow custom execution of queuing logic depending upon the events which occur during the lifetime of a Qube job or upon pre-defined system events.

The use of callbacks can range from sending email when a job has completed, to designing complex dependency trees or direct integration with an asset tracking system. There is also a special case that allows for delayed execution of the job, see: [How to submit a job that will wait until later to run](#)

When specifying a callback, Qube requires a little information in order to execute it properly. Each callback must include:

1. The **trigger** expression to specify when the callback should be executed.
2. The scripting **language** to use for the callback.
3. The action or **code** the callback will execute each time the trigger condition is met.

## Callbacks In Detail:

Callbacks are defined as a list of one or more key/value pairs which is appended to the job's `callback` list.

- [Callback execution environment](#)
- [Callback languages](#)
- [Triggers](#)
- [Properties and Uses](#)

**Python API Examples - refer to the above pages for more information**

**JobB waits for the entire jobA to complete**

## Using the "qube" callback language

```
frameRange = '1-10'

jobA = {
  'name': 'my ribgen job',
  'label': 'ribgenLabel',
  'prototype': 'cmdrange',
  'package': {
    'cmdline': 'my ribgen command...'
  },
  'agenda': qb.genframes(frameRange),
}

jobB = {
  'name': 'my render job',
  'label': 'render',
  'status': 'blocked',
  'prototype': 'cmdrange',
  'package': {
    'cmdline': 'my render command...'
  },
  'agenda': qb.genframes(frameRange),
}

callbacks = [
  {
    'triggers': 'complete-job-ribgenLabel',
    'language': 'qube',
    'code': 'unblock-self'
  }
]
jobB['callbacks'] = callbacks

qb.submit( [jobA, jobB] )
```

**Using the "python" callback language is identical to the first example, except the callback's "language" and "code" is different**

```
jobA = {  
  .  
  .  
  .  
}  
  
jobB = {  
  .  
  .  
  .  
}  
  
cbCode = 'jobId = qb.jobid()\n'  
cbCode += 'qb.unblock(jobId)\n'  
  
callbacks = [  
  {  
    'triggers': 'complete-job-ribgenLabel',  
    'language': 'python',  
    'code': cbCode  
  }  
]  
jobB['callbacks'] = callbacks  
  
qb.submit( [jobA, jobB] )
```

**Each frame in JobB waits for the its corresponding frame in jobA to complete**

## Using the "qube" callback language

```
frameRange = '1-10'

jobA = {
  'name': 'my ribgen job',
  'label': 'ribgenLabel',
  'prototype': 'cmdrange',
  'package': {
    'cmdline': 'my ribgen command...'
  },
  'agenda': qb.genframes(frameRange),
}

jobB = {
  'name': 'my render job',
  'label': 'render',
  'status': 'blocked',
  'prototype': 'cmdrange',
  'package': {
    'cmdline': 'my render command...'
  },
  'agenda': qb.genframes(frameRange),
}

callbacks = []
for work in jobB['agenda']:
  work['status'] = 'blocked'
  callbacks.append(
    {
      'triggers': 'complete-work-ribgenLabel-%s' % work['name'],
      'language': 'qube',
      'code': 'unblock-work-self',
    }
  )
]
jobB['callbacks'] = callbacks

qb.submit( [jobA, jobB] )
```

Using the "python" callback language is identical to the first example, except the callback's "language" and "code" is different

```
jobA = {
    .
    .
    .
}

jobB = {
    .
    .
    .
}

callbacks = []
for work in jobB['agenda']:
    work['status'] = 'blocked'
    frameNumber = work['name']

    # the agenda item's callback should unblock both itself and the job
    cbCode = 'jobId = qb.jobid()\n'
    cbCode += 'qb.workunblock("%%s:%%s" %% jobId)\n' % frameNumber
    cbCode += 'qb.unblock(jobId)\n'

    callbacks.append(
        {
            'triggers': 'complete-work-ribgenLabel-%%s' % frameNumber,
            'language': 'python',
            'code': cbCode,
        }
    )
]
jobB['callbacks'] = callbacks

qb.submit( [jobA, jobB] )
```

## JobC waits for jobA and jobB

This can be done using any of the callback languages, the only difference is the **triggers** value

**Using the "python" callback language is identical to the first example, except the callback's "language" and "code" is different**

```
jobA = {
  'label': 'ribGen',
  .
  .
}

jobB = {
  'label': 'render',
  .
  .
}

jobC = {
  'label': 'composite'
  .
  .
}

callbacks = []
for work in jobC['agenda']:
  work['status'] = 'blocked'
  frameNumber = work['name']

  # the agenda item's callback should unblock both itself and the job
  cbCode = 'jobId = qb.jobid()\n'
  cbCode += 'qb.workunblock("%s:%s" %% jobId)\n' % frameNumber
  cbCode += 'qb.unblock(jobId)\n'

  triggerStr = 'complete-work-ribgen-%s' % frameNumber
  triggerStr += ' && '
  triggerStr += 'complete-work-render-%s' % frameNumber

  callbacks.append(
    {
      'triggers': triggerStr,
      'language': 'python',
      'code': cbCode,
    }
  )
]
jobB['callbacks'] = callbacks

qb.submit( [jobA, jobB, jobC] )
```

**JobD waits for either (jobA AND jobB) OR jobC**

This is identical to the above example, except the 'triggerStr' is different

```
jobA = {
  'label': 'ribGen',
  .
  .
}

jobB = {
  'label': 'render',
  .
  .
}

jobC = {
  'label': 'composite',
  .
  .
}

jobD = {
  'label': 'sendToDailies',
  .
  .
}

callbacks = []
for work in jobD['agenda']:
  work['status'] = 'blocked',
  frameNumber = work['name']

  # the agenda item's callback should unblock both itself and the job
  cbCode = 'jobId = qb.jobid()\n'
  cbCode += 'qb.workunblock("%s:%s" %% jobId)\n' % frameNumber
  cbCode += 'qb.unblock(jobId)\n'

  triggerSt = '('
  triggerStr += 'complete-work-ribgen-%s' % frameNumber
  triggerStr += ' && '
  triggerStr += 'complete-work-render-%s' % frameNumber
  triggerStr += ')'

  triggerStr += ' || '
  triggerStr = 'complete-work-composite-%s' % frameNumber

  callbacks.append(
    {
      'triggers': triggerStr,
      'language': 'python',
      'code': cbCode,
    }
  )
]
jobB['callbacks'] = callbacks

qb.submit( [jobA, jobB, jobC, jobD] )
```

