Semaphore Service

The Semaphore service works in the same manner as the Lock service, which enables a business process to request, renew, or delete a lock for a particular resource, except that the Semaphore service allows 1-n semaphores (locks) to exist on a particular resource instead of just one lock.

The following table provides an overview of the Semaphore service:

System Name	GetSemaphoreService and ReleaseSemaphoreService
Graphical Process Modeler (GPM) categories)	All Services
Description	The Semaphore service works in the same manner as the Lock service, except that it allows 1-n locks to exist on a particular resource.
Business usage	This service allows 1-n locks to exist on a particular resource that is to be used in a business process at run time. This allows access to be controlled as required by the application or resource, which may have implication on performance due to resource limitations or any other reason.
Usage example	Generates a resource lock for a business process and releases the same lock at the end of business process.
Preconfigured?	GetSemaphoreService and ReleaseSemaphoreService
Requires third party files?	No
Platform availability	All supported application platforms.
Related services	Lock service
Application requirements	None
Initiates business processes?	No
Invocation	Should only be invoked by the e-Invoice process flow.
Business process context considerations	None
Returned status values	Success, Error
Restrictions	None
Persistence level	Does not set the persistence level, therefore the persistence level defaults to the workflow.
Testing considerations	Error (log) information for this service is located at: Operations > System > Logs > eInvoicing

How the Semaphore Service Works

The Semaphore service works in the same manner as the Lock service, which enables a business process to request, renew, or delete a lock for a particular resource, except that the Semaphore service allows 1-n locks to exist on a particular resource instead of just one lock.

The Semaphore service uses the semaphore identifier and time that you set in the GPM or business process to identify the lock to set and how long to keep the application or resource locked.

Implementing the Semaphore Service

To implement the Semaphore service, complete the following tasks:

1. Specify field settings for each instance in the service configuration in the GPM as necessary. See *Setting Up the Service in the GPM or Business Process* on page 3 or create a business process to supply the appropriate parameters. See *Parameters Passed From Service to the Business Process* on page 4.

2. Include two instances of the Semaphore service in your business process (one to lock resources, another to unlock them). Also ensure that you specify the same lock key for both.

Note: Use the GetSemaphoreService instance to set locks and the ReleaseSemaphoreService instance to release locks.

Configuring the Semaphore Service

1. Select **Deployment > Services > Configuration**.
2. Search for Semaphore service or select it from the list and click **Go!**.
3. Click **Edit**.
4. Specify field settings in the GPM (see the description of parameters on page 4).
5. On the Confirm page, verify that the **Enable Service for Business Processes** check box is selected.

Setting Up the Service in the GPM or Business Process

Use the field definitions in the following table to set up the service configuration in the GPM or add the appropriate parameters to your business process:

Note: If you need to overwrite the value that you have already configured in the service instance user interface page, you can pass the new value from the business process using the BPML parameters below.

Parameter	Description
Action	Specifies the action to grant a semaphore lock or release a semaphore lock. Valid values are: ◆ GRANT ◆ RELEASE Required. BPML value is ACTION.
Semaphore	The name of the application or resource on which the lock is applied. Required for GRANT action only. **Note:** You cannot use spaces with this parameter value. BPML value is SEMAPHORE.
Semaphore ID	The semaphore identifier for releasing a resource. Required for RELEASE action only. BPML value is SEMAPHORE_ID.
Max Count	The maximum number of locks that can be granted. Required for GRANT action only. BPML value is MAX_COUNT.
Time Out	The expiration time for the lock. The default is -1 (never). Optional. BPML value is TIME_OUT.
User	The name of the user or resource holding the lock. Optional. BPML value is USER.
Wait Time	The length of time to wait if the request exceeds the maximum number of locks. The default value is -1 (no wait time). Optional. BPML value is WAIT_TIME.
Desc	The description of the lock. Optional. BPML value is DESC.
Node Name	The cluster node name reserving the lock. This value enables the system to successfully clear the lock on startup without impacting any other nodes in a clustered environment. Optional. BPML value is NODE_NAME.
Clear on Start Up	Whether the semaphore reservation (lock) should expire on system restart. Valid values are TRUE (default--lock should expire on system restart) and FALSE. Optional. BPML value is CLEAR_ON_START_UP. **Note:** Use when you want to ensure that the lock is always clear when the application is restarted.

Parameters Passed From Service to the Business Process

The following table contains the parameter passed from the Semaphore service to the business process:

Parameter	Description
SEMAPHORE_ID	The semaphore identifier for releasing a resource. Required for RELEASE action only. BPML value is SEMAPHORE_ID.

GetSemaphoreService Business Process Example

The following is an example of how the Semaphore service is called to set a semaphore (lock).

Note: If more than one business process needs to share the same semaphore, ensure that the semaphore name used for each business process is the same.

```
<operation name="requesting semaphore">
  <participant name="GetSemaphoreService"/>
    <output message="Xout">
      <assign to="SEMAPHORE">getSemaphoreTest_3</assign>
      <assign to="MAX_COUNT">2</assign>
      <assign to="TIME_OUT">50</assign>
    </output>
    <input message="Xin">
      <assign to="." from="*"></assign>
    </input>
</operation>
```

ReleaseSemaphoreService Business Process Example

The following is an example of how the Semaphore service is called to release a semaphore (lock).

Note: SEMAPHORE_ID is mandatory. ReleaseSemaphoreService deletes the semaphore on SEMAPHORE_ID, which is set by GetSemaphoreService. After deleting, SEMAPHORE_ID is removed from process data. If nothing is deleted, no error is promulgated.

```
<operation name="releasing semaphore">
  <participant name="ReleaseSemaphoreService"/>
    <output message="Xout">
          <assign to="." from="*"></assign>
    </output>
    <input message="Xin">
          <assign to="." from="*"></assign>
    </input>
</operation>
```

Enabling Semaphore Document Tracking

When you are creating or editing your Semaphore business process in the business process text editor, you can easily enable Semaphore document tracking in the application by selecting the **Document Tracking** check box on the Process Levels page. Set the following options as needed and leave the rest of the business process parameters as the defaults:

✦ On the **Deadline Settings** page, set the deadline and notification options, if necessary.

✦ On the **Life Span** page, set the life span, if necessary.