

Advanced Tuning Parameters

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Feature Summary and Revision History

Summary Data

Table 1: Summary Data

Applicable Product(s) or Functional Area	PCF
Applicable Platform(s)	SMI
Feature Default Setting	Disabled – Configuration required to enable
Related Documentation	Not Applicable

Revision History

Table 2: Revision History

Revision Details	Release
Enhancement introduced. PCF supports message threshold per endpoint.	2022.02.0
Enhancement introduced. Added procedure to configure the N7 stale session error codes.	2020.05.01
First introduced.	2020.01.0

Feature Description

The PCF Ops Center allows you to configure the advanced tuning parameters for PCF. The tuning parameters primarily consist of the async-threading and http2-threading parameters. These parameters provide the flexibility of the tuning threads responsible for PCF's incoming and outgoing requests over HTTP.

Note Configure the advanced tuning parameter values only if you have a strong understanding of the PCF deployment.

PCF supports the message threshold per endpoint.

Note Message threshold is applicable only for the configured message types in rest-endpoint

Configuration Support for the Advanced Tuning Parameters

This section describes how to configure the advanced tuning parameters using the CLI. The configuration of the advanced tuning parameters involves:

- Configuring the Async Threading Parameters
- Configuring the HTTP2 Threading Parameters
- Configuring the N7 Stale Session Error Codes
- Configuring the Message Threshold Per Endpoint
- Configuring the HTTP2 Heap Memory Tuning

Configuring the Async Threading Parameters

This section describes how to fine tune the async threading parameters.

To configure the http2-threading parameters, use the following configuration in the Policy Ops Center console:

```
config
  advance-tuning
  async-threading
    default-priority default_priority
    default-worker-threads default_worker_threads
    default-queue-size default_queue_size
    default-processing-threads default_processing_threads
    default-drop-oldest-when-full [ true | false ]
    threading-config service_name
    priority priority
    queue-size queue_size
    threads number_threads
    end
```

NOTES:

- **advance-tuning**—Enters the advance tuning configuration mode.
- **async-threading**—Enters the async threading configuration mode.
- **default-priority** *default_priority*—Specify the default priority level.
- **default-worker-threads** *default_worker_threads*—Specify the default number of worker threads.
- **default-queue-size** *default_queue_size*—Specify the default size of the queue.
- **default-processing-threads** *default_processing_threads*—Specify the default number of threads used for processing.
- **default-drop-oldest-when-full [true | false]** —Indicates if the oldest message in the queue should be removed when the queue is full.
- **threading-config** *service_name*—Specify the service name for which the threading configuration is enabled.
- **priority** *priority*—Specify the priority of the thread.
- **queue-size** *queue_size*—Specify the queue size.
- **threads** *number_threads*—Specify the number of threads to be processed.

Configuring the HTTP2 Threading Parameters

This section describes how to refine the http2-threading parameters.

To configure the http2-threading parameters, use the following configuration in the Policy Ops Center console:

```
config
   http2-threading
   min-thread-pool-size min_thread_pool
   max-thread-pool-size max_thread_pool
     idle-thread-timeout-ms idle_thread_timeout
     max-queue-capacity max_queue_capacity
     disable-validation [ true | false ]
     end
```

NOTES:

- **http2-threading** *http2_threading*—Specify the parameters for inbound SBA requests that are received by PCF.
- **min-thread-pool-size** *min_thread_pool*—Specify the minimum number of threads for processing the inbound SBA request. The accepted range contains integers. Default value is 5.
- **max-thread-pool-size** *max_thread_pool*—Specify the maximum size of the thread pool.
- **idle-thread-timeout-ms** *idle_thread_timeout*—Specify the time in milliseconds that the thread can remain idle. *idle_thread_timeout* must contain only integers. Default value is 60000.
- **disable-validation [true | false]**—Disables the validation of the request sent to PCF. **[true | false]** must contain the value as true or false. Default value is false.

- **max-queue-capacity** *max_queue_capacity*—Specify the maximum number of requests that can wait in the queue for processing. *max_queue_capacity* must contain only integers. Default value is 5000.
- **max-thread-pool-size** *max_thread_pool*—Specify the maximum number of threads that PCF can accommodate in the pool. *max_thread_pool_size* must contain only integers. Default value is 20.

Configuring the N7 Stale Session Error Codes

This section describes how to configure the error codes for the N7 stale sessions.

To configure the n7-stale-session-error-codes parameters, use the following configuration in the Policy Ops Center console:

```
config
  advance-tuning
    n7-stale-session-error-codes error_codes
    end
```

NOTES:

- **n7-stale-session-error-codes** *error_codes*—Specify the error code values for the N7 sessions. When a session is idle, the PCF revalidates it by using the N7NotifyUpdate request. If the N7NotifyUpdate response includes any one or more specified error codes, then the session expiry time is reverted to original value.

  You can specify multiple error codes using comma-separated values.

Configuring the Message Threshold Per Endpoint

This section describes how to configure the message threshold enhancement.

To configure the message threshold enhancement, use the following configuration in the Policy Ops Center console:

```
config
   advance-tuning
      overload-control
         rest
            global
              action threshold-action { N7_CREATE | N7_DELETE | N7_UPDATE
 | N15_CREATE | N15_DELETE | N15_UPDATE}
                  discard-action { DROP | REJECT } threshold-count
threshold_count
                     end
```

NOTES:

- **discard-action { DROP | REJECT } threshold-count** *threshold_count*—Specify the type of discard-action when the message is received at endpoint. The threshold-count provides the maximum number of inbound messages for each threshold-action configured per endpoint. For example, N7_CREATE or N7_DELETE.

Configuring the HTTP2 Heap Memory Tuning

This section describes how to configure the http2 heap memory tuning.

To configure the http2 heap memory tuning parameters, use the following configuration in the PCF Ops Center console:

```
config
      advance-tuning app-resource-control rest-ep memory max-heap-size
max_heap_size
      advance-tuning app-resource-control rest-ep memory new-gen-size
new_gen_size
      advance-tuning http2-client-threading interface-config interface_type

      max-thread-pool-size max_thread_pool_size
      max-heap-size max_heap_size
      exit
```

NOTES:

- **advance-tuning app-resource-control rest-ep memory max-heap-size** *max_heap_size*—Specifies the max heap size (in GB) allotted to a rest-ep. The accepted range contains integers. Default value is 4.
- **advance-tuning app-resource-control rest-ep memory new-gen-size** *new_gen_size*—Specifies the new gen size (in GB) allotted to a rest-ep. The accepted range contains integers. Default value is 3.
- **advance-tuning http2-client-threading interface-config** *interface_type* **max-thread-pool-size** *max_thread_pool_size*—Specifies the maximum size of the thread pool. The accepted range contains integers. The default value is 200, minimum value is 20, and the maximum value is 400.
- **advance-tuning http2-client-threading interface-config** *interface_type* **max-heap-size** *max_heap_size* —Specifies http2-client max heap size configured for an interface. The accepted range contains long. The default value is -1, and the minimum value is 16384.
- The above http2-client-threading configuration is supported for all type of interfaces (N5, N7, N15, N28, N36 and NRF).

OAM Support

This section describes operations, administration, and maintenance information for this feature.

Bulk Statistics Support

This section provides the list of statistics and counters that are generated for the monitoring for message threshold enhancement.

Note The following values apply to all the statistics:

- Unit - Int64
- Type - Counter
- Nodes - Service

The following metrics track the counter information:

- inbound_request_threshold_exceeded_total - Captures the total count of the inbound threshold requests exceeded due to overload.

  The following labels are defined for this metric:

  - interface_name
  - service_name
  - operation_name
  - command
  - action