



# NVIDIA VIDEO CODEC SDK - ENCODER

## NVENC Preset Migration Guide

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# Chapter 1. Introduction

This document provides table to map the NVENCODER API settings (specifically, preset and rate control mode) from Video Codec SDK 9.1 and earlier to the closest equivalent NVENCODER API settings in Video Codec SDK 10.0 and later. This table can be used as a migration guide to migrate to the new NVENCODER API preset architecture introduced in Video Codec SDK 10.0.

In general, it is strongly recommended to use the newer presets and NVENCODER API settings based on desired performance/quality trade-off. It is highly likely that your application may benefit from better quality encoding or higher performance by directly using the new NVENCODER API presets, as the new APIs provide much more flexibility than earlier and are easy to understand.

Please use the mapping tables in this document only in situations where exactly same performance/quality is desired as was obtained in the older presets.

[Table 1](#) and [Table 2](#) show the mapping between older and newer presets exposed in the NVENCODER API for HEVC and H.264, respectively. Note that there is no support for older presets in AV1

A combination of older preset (Column 1), rate control (RC) mode (Column 2) and resolution (Column 3) can be mapped to a new parameters of NVENCODER API: tuning info (Column 4), RC Mode (Column 5), preset (Column 7&9) and multipass (Column 6&8). The newer preset and multipass values will vary based on GPU Architecture and appropriate GPU architecture column must be selected.

In some cases, additional settings need to be included for exact mapping, and they are mentioned in columns Features 1 (Column 10 in [Table 1](#) and Column 12 in [Table 2](#)) and Features 2 (Column 11 in [Table 1](#) and Column 13 in [Table 2](#)).

As an example, if someone is using HEVC HQ Preset with VBR\_HQ RC Mode for a 1080p encoding on Turing platform, this corresponds to Row 18 in [Table 1](#). The closest settings as per the new NVENCODER API is P6 Preset, RC Mode VBR, Multipass set to 1, FrameIntervalP set to 1, IDR Period set to 60 and GOP Length set to 60.

It is important to note that Features 1 and Features 2 are just indicated to get an exact feature match on older presets and most applications would set these based on needs. For example, GOP length may be set to a larger value depending upon the application needs.

# Chapter 2. HEVC Preset Migration Table

Table 1. HEVC Preset Migration Table

| Settings in Video Codec SDK 9.1 and earlier |             |            | Equivalent settings in Video Codec SDK 10.0 and later |         |                                    |                             |                                 |                              |                  |            |
|---|-------------|------------|---|---------|------------------------------------|-----------------------------|---------------------------------|------------------------------|------------------|------------|
| Old Preset                                  | Old RC Mode | Resolution | Tuning Info   | RC Mode | Ampere/<br>Turing<br>Multi<br>Pass | Ampere/<br>Turing<br>Preset | Pascal/<br>Maxwell<br>MultiPass | Pascal/<br>Maxwell<br>Preset | Features 1       | Features 2 |
| HP  | VBR         | 720        | High Quality  | VBR     | 0                                  | P1                          | 0                               | P4                           | frameIntervalP 1 |            |
| HP  | VBR         | 1080       | High Quality  | VBR     | 0                                  | P1                          | 0                               | P4                           | idr period 60    |            |
| HP  | VBR         | 2160       | High Quality  | VBR     | 0                                  | P1                          | 0                               | P4                           | gop length 60    |            |
| HP  | VBR_HQ      | 720        | High Quality  | VBR     | 1                                  | P1                          | 1                               | P4                           |                  |            |
| HP  | VBR_HQ      | 1080       | High Quality  | VBR     | 1                                  | P1                          | 1                               | P4                           |                  |            |
| HP  | VBR_HQ      | 2160       | High Quality  | VBR     | 1                                  | P1                          | 1                               | P4                           |                  |            |
| Default                                     | VBR         | 720        | High Quality  | VBR     | 0                                  | P5                          | 0                               | P5                           |                  |            |
| Default                                     | VBR         | 1080       | High Quality  | VBR     | 0                                  | P5                          | 0                               | P5                           |                  |            |
| Default                                     | VBR         | 2160       | High Quality  | VBR     | 0                                  | P5                          | 0                               | P5                           |                  |            |
| Default                                     | VBR_HQ      | 720        | High Quality  | VBR     | 1                                  | P5                          | 2                               | P5                           |                  |            |
| Default                                     | VBR_HQ      | 1080       | High Quality  | VBR     | 1                                  | P5                          | 1                               | P5                           |                  |            |
| Default                                     | VBR_HQ      | 2160       | High Quality  | VBR     | 1                                  | P5                          | 1                               | P5                           |                  |            |
| HQ  | VBR         | 720        | High Quality  | VBR     | 0                                  | P6                          | 0                               | P6                           |                  |            |
| HQ  | VBR         | 1080       | High Quality  | VBR     | 0                                  | P6                          | 0                               | P6                           |                  |            |
| HQ  | VBR         | 2160       | High Quality  | VBR     | 0                                  | P5                          | 0                               | P6                           |                  |            |
| HQ  | VBR_HQ      | 720        | High Quality  | VBR     | 1                                  | P6                          | 2                               | P6                           |                  |            |
| HQ  | VBR_HQ      | 1080       | High Quality  | VBR     | 1                                  | P6                          | 1                               | P6                           |                  |            |
| HQ  | VBR_HQ      | 2160       | High Quality  | VBR     | 1                                  | P5                          | 1                               | P6                           |                  |            |
| LowLatencyHP                                | CBR         | 720        | Low Latency   | CBR     | 0                                  | P2                          | 0                               | P4                           |                  |            |
| LowLatencyHP                                | CBR         | 1080       | Low Latency   | CBR     | 0                                  | P2                          | 0                               | P4                           |                  |            |
| LowLatencyHP                                | CBR         | 2160       | Low Latency   | CBR     | 0                                  | P1                          | 0                               | P4                           |                  |            |

| Settings in Video Codec SDK 9.1 and earlier |                 |            | Equivalent settings in Video Codec SDK 10.0 and later |         |                                    |                             |                                 |                              |                  |                         |
|---|-----------------|------------|---|---------|------------------------------------|-----------------------------|---------------------------------|------------------------------|------------------|-------------------------|
| Old Preset                                  | Old RC Mode     | Resolution | Tuning Info   | RC Mode | Ampere/<br>Turing<br>Multi<br>Pass | Ampere/<br>Turing<br>Preset | Pascal/<br>Maxwell<br>MultiPass | Pascal/<br>Maxwell<br>Preset | Features 1       | Features 2              |
| LowLatencyHP                                | CBR_HQ          | 720        | Ultra Low Latency                                     | CBR     | 1                                  | P2                          | 1                               | P4                           |                  |                         |
| LowLatencyHP                                | CBR_HQ          | 1080       | Ultra Low Latency                                     | CBR     | 1                                  | P2                          | 1                               | P4                           |                  |                         |
| LowLatencyHP                                | CBR_HQ          | 2160       | Ultra Low Latency                                     | CBR     | 1                                  | P1                          | 1                               | P4                           |                  |                         |
| LowLatencyHP                                | CBR2LD          | 720        | Low Latency   | CBR     | 1                                  | P2                          | 1                               | P4                           |                  |                         |
| LowLatencyHP                                | CBR2LD          | 1080       | Low Latency   | CBR     | 1                                  | P2                          | 1                               | P4                           |                  |                         |
| LowLatencyHP                                | CBR2LD          | 2160       | Low Latency   | CBR     | 1                                  | P1                          | 1                               | P4                           |                  |                         |
| LowLatencyDefault                           | CBR             | 720        | Low Latency   | CBR     | 0                                  | P4                          | 0                               | P4                           |                  |                         |
| LowLatencyDefault                           | CBR             | 1080       | Low Latency   | CBR     | 0                                  | P3                          | 0                               | P4                           |                  |                         |
| LowLatencyDefault                           | CBR             | 2160       | Low Latency   | CBR     | 0                                  | P2                          | 0                               | P4                           |                  |                         |
| LowLatencyDefault                           | CBR_HQ          | 720        | Ultra Low Latency                                     | CBR     | 2                                  | P4                          | 2                               | P4                           |                  |                         |
| LowLatencyDefault                           | CBR_HQ          | 1080       | Ultra Low Latency                                     | CBR     | 1                                  | P3                          | 1                               | P4                           |                  |                         |
| LowLatencyDefault                           | CBR_HQ          | 2160       | Ultra Low Latency                                     | CBR     | 1                                  | P2                          | 1                               | P4                           |                  |                         |
| LowLatencyDefault                           | CBR_LOWDELAY_HQ | 720        | Low Latency   | CBR     | 2                                  | P4                          | 2                               | P4                           |                  |                         |
| LowLatencyDefault                           | CBR_LOWDELAY_HQ | 1080       | Low Latency   | CBR     | 1                                  | P3                          | 1                               | P4                           |                  |                         |
| LowLatencyDefault                           | CBR_LOWDELAY_HQ | 2160       | Low Latency   | CBR     | 1                                  | P2                          | 1                               | P4                           |                  |                         |
| LowLatencyHQ                                | CBR             | 720        | Low Latency   | CBR     | 0                                  | P5                          | 0                               | P6                           |                  |                         |
| LowLatencyHQ                                | CBR             | 1080       | Low Latency   | CBR     | 0                                  | P4                          | 0                               | P4                           |                  |                         |
| LowLatencyHQ                                | CBR             | 2160       | Low Latency   | CBR     | 0                                  | P4                          | 0                               | P4                           |                  |                         |
| LowLatencyHQ                                | CBR_HQ          | 720        | Ultra Low Latency                                     | CBR     | 2                                  | P5                          | 2                               | P6                           |                  |                         |
| LowLatencyHQ                                | CBR_HQ          | 1080       | Ultra Low Latency                                     | CBR     | 2                                  | P4                          | 2                               | P4                           |                  |                         |
| LowLatencyHQ                                | CBR_HQ          | 2160       | Ultra Low Latency                                     | CBR     | 1                                  | P4                          | 1                               | P4                           |                  |                         |
| LowLatencyHQ                                | CBR_LOWDELAY_HQ | 720        | Low Latency   | CBR     | 2                                  | P5                          | 2                               | P6                           |                  |                         |
| LowLatencyHQ                                | CBR_LOWDELAY_HQ | 1080       | Low Latency   | CBR     | 2                                  | P4                          | 2                               | P4                           |                  |                         |
| LowLatencyHQ                                | CBR_LOWDELAY_HQ | 2160       | Low Latency   | CBR     | 1                                  | P4                          | 1                               | P4                           |                  |                         |
| BD  | VBR             | 720        | High Quality  | VBR     | 0                                  | P5                          | 0                               | P5                           | frameIntervalP 1 | outputseiBufferPeriod 1 |
| BD  | VBR             | 1080       | High Quality  | VBR     | 0                                  | P5                          | 0                               | P5                           | idr period 60    | outputseiPictureTime 1  |
| BD  | VBR             | 2160       | High Quality  | VBR     | 0                                  | P5                          | 0                               | P6                           | gop length 60    | outputAud 1             |
| BD  | VBR_HQ          | 720        | High Quality  | VBR     | 1                                  | P5                          | 2                               | P5                           |                  |                         |
| BD  | VBR_HQ          | 1080       | High Quality  | VBR     | 1                                  | P5                          | 1                               | P5                           |                  |                         |
| BD  | VBR_HQ          | 2160       | High Quality  | VBR     | 1                                  | P5                          | 1                               | P5                           |                  |                         |

| Settings in Video Codec SDK 9.1 and earlier |             |            | Equivalent settings in Video Codec SDK 10.0 and later |         |                                    |                             |                                 |                              |                     |            |
|---|-------------|------------|---|---------|------------------------------------|-----------------------------|---------------------------------|------------------------------|---------------------|------------|
| Old Preset                                  | Old RC Mode | Resolution | Tuning Info   | RC Mode | Ampere/<br>Turing<br>Multi<br>Pass | Ampere/<br>Turing<br>Preset | Pascal/<br>Maxwell<br>MultiPass | Pascal/<br>Maxwell<br>Preset | Features 1          | Features 2 |
| LosslessHP                                  | CQP         | 720        | Lossless  | CQP     | X                                  | P3                          | X                               | P3                           | frameIntervalP<br>1 |            |
| LosslessHP                                  | CQP         | 1080       | Lossless  | CQP     | X                                  | P3                          | X                               | P3                           | idr period 30       |            |
| LosslessHP                                  | CQP         | 2160       | Lossless  | CQP     | X                                  | P3                          | X                               | P3                           | gop length 30       |            |
| LosslessDefault                             | CQP         | 720        | Lossless  | CQP     | X                                  | P5                          | X                               | P5                           |                     |            |
| LosslessDefault                             | CQP         | 1080       | Lossless  | CQP     | X                                  | P5                          | X                               | P5                           |                     |            |
| LosslessDefault                             | CQP         | 2160       | Lossless  | CQP     | X                                  | P5                          | X                               | P5                           |                     |            |

# Chapter 3. H264 Preset Migration Table

Table 2. H264 Preset Migration Table

| Settings in Video Codec SDK 9.1 and earlier |             |            | Equivalent settings in Video Codec SDK 10.0 and later |         |                                     |                             |                                      |                              |                          |                  |                  |                 |
|---|-------------|------------|---|---------|-------------------------------------|-----------------------------|--------------------------------------|------------------------------|--------------------------|------------------|------------------|-----------------|
| Old Preset                                  | Old RC Mode | Resolution | Tuning Info   | RC Mode | Ampere/<br>Turing<br>Multi-<br>Pass | Ampere/<br>Turing<br>Preset | Pascal/<br>Maxwell<br>Multi-<br>Pass | Pascal/<br>Maxwell<br>Preset | Kepler<br>Multi-<br>Pass | Kepler<br>preset | Features 1       | Features 2      |
| HP  | VBR         | 720        | High Quality  | VBR     | 0                                   | P2                          | 0                                    | P1                           | 0                        | P1               | frameIntervalP 1 |                 |
| HP  | VBR         | 1080       | High Quality  | VBR     | 0                                   | P2                          | 0                                    | P1                           | 0                        | P1               | idr period 30    |                 |
| HP  | VBR         | 2160       | High Quality  | VBR     | 0                                   | P2                          | 0                                    | P1                           | 0                        | P1               | gop length 30    |                 |
| HP  | VBR_HQ      | 720        | High Quality  | VBR     | 1                                   | P2                          | 1                                    | P1                           | 2                        | P1               |                  |                 |
| HP  | VBR_HQ      | 1080       | High Quality  | VBR     | 1                                   | P2                          | 1                                    | P1                           | 2                        | P1               |                  |                 |
| HP  | VBR_HQ      | 2160       | High Quality  | VBR     | 1                                   | P2                          | 1                                    | P1                           | 2                        | P1               |                  |                 |
| Default                                     | VBR         | 720        | High Quality  | VBR     | 0                                   | P3                          | 0                                    | P3                           | 0                        | P3               |                  | sliceMode 3     |
| Default                                     | VBR         | 1080       | High Quality  | VBR     | 0                                   | P3                          | 0                                    | P3                           | 0                        | P3               |                  | sliceModeData 4 |
| Default                                     | VBR         | 2160       | High Quality  | VBR     | 0                                   | P3                          | 0                                    | P3                           | 0                        | P3               |                  |                 |
| Default                                     | VBR_HQ      | 720        | High Quality  | VBR     | 2                                   | P3                          | 2                                    | P3                           | 2                        | P3               |                  |                 |
| Default                                     | VBR_HQ      | 1080       | High Quality  | VBR     | 2                                   | P3                          | 2                                    | P3                           | 2                        | P3               |                  |                 |
| Default                                     | VBR_HQ      | 2160       | High Quality  | VBR     | 1                                   | P4                          | 1                                    | P3                           | 2                        | P3               |                  |                 |
| HQ  | VBR         | 720        | High Quality  | VBR     | 0                                   | P4                          | 0                                    | P4                           | 0                        | P4               |                  |                 |
| HQ  | VBR         | 1080       | High Quality  | VBR     | 0                                   | P4                          | 0                                    | P4                           | 0                        | P4               |                  |                 |
| HQ  | VBR         | 2160       | High Quality  | VBR     | 0                                   | P4                          | 0                                    | P4                           | 0                        | P4               |                  |                 |
| HQ  | VBR_HQ      | 720        | High Quality  | VBR     | 2                                   | P4                          | 2                                    | P4                           | 2                        | P4               |                  |                 |
| HQ  | VBR_HQ      | 1080       | High Quality  | VBR     | 1                                   | P5                          | 1                                    | P5                           | 2                        | P4               |                  |                 |
| HQ  | VBR_HQ      | 2160       | High Quality  | VBR     | 1                                   | P5                          | 1                                    | P5                           | 2                        | P4               |                  |                 |
| LowLatencyHP                                | CBR         | 720        | Low Latency   | CBR     | 0                                   | P2                          | 0                                    | P4                           | 0                        | P3               |                  | sliceMode 3     |
| LowLatencyHP                                | CBR         | 1080       | Low Latency   | CBR     | 0                                   | P2                          | 0                                    | P3                           | 0                        | P3               |                  | sliceModeData 4 |
| LowLatencyHP                                | CBR         | 2160       | Low Latency   | CBR     | 0                                   | P2                          | 0                                    | P2                           | 0                        | P2               |                  |                 |
| LowLatencyHP                                | CBR_HQ      | 720        | Ultra Low Latency                                     | CBR     | 1                                   | P2                          | 1                                    | P4                           | 2                        | P3               |                  |                 |
| LowLatencyHP                                | CBR_HQ      | 1080       | Ultra Low Latency                                     | CBR     | 1                                   | P2                          | 1                                    | P3                           | 2                        | P3               |                  |                 |

| Settings in Video Codec SDK 9.1 and earlier |                 |            | Equivalent settings in Video Codec SDK 10.0 and later |         |                                     |                             |                                      |                              |                          |                  |                  |                         |
|---|-----------------|------------|---|---------|-------------------------------------|-----------------------------|--------------------------------------|------------------------------|--------------------------|------------------|------------------|-------------------------|
| Old Preset                                  | Old RC Mode     | Resolution | Tuning Info   | RC Mode | Ampere/<br>Turing<br>Multi-<br>Pass | Ampere/<br>Turing<br>Preset | Pascal/<br>Maxwell<br>Multi-<br>Pass | Pascal/<br>Maxwell<br>Preset | Kepler<br>Multi-<br>Pass | Kepler<br>preset | Features 1       | Features 2              |
| LowLatencyHP                                | CBR_HQ          | 2160       | Ultra Low Latency                                     | CBR     | 1                                   | P2                          | 1                                    | P2                           | 2                        | P2               |                  |                         |
| LowLatencyHP                                | CBR_LOWDELAY_HQ | 720        | Low Latency   | CBR     | 1                                   | P2                          | 1                                    | P4                           | 2                        | P3               |                  |                         |
| LowLatencyHP                                | CBR_LOWDELAY_HQ | 1080       | Low Latency   | CBR     | 1                                   | P2                          | 1                                    | P3                           | 2                        | P3               |                  |                         |
| LowLatencyHP                                | CBR_LOWDELAY_HQ | 2160       | Low Latency   | CBR     | 1                                   | P2                          | 1                                    | P2                           | 2                        | P2               |                  |                         |
| LowLatencyDefault                           | CBR             | 720        | Low Latency   | CBR     | 0                                   | P4                          | 0                                    | P4                           | 0                        | P4               |                  |                         |
| LowLatencyDefault                           | CBR             | 1080       | Low Latency   | CBR     | 0                                   | P3                          | 0                                    | P4                           | 0                        | P3               |                  |                         |
| LowLatencyDefault                           | CBR             | 2160       | Low Latency   | CBR     | 0                                   | P2                          | 0                                    | P2                           | 0                        | P2               |                  |                         |
| LowLatencyDefault                           | CBR_HQ          | 720        | Ultra Low Latency                                     | CBR     | 2                                   | P4                          | 2                                    | P4                           | 2                        | P4               |                  |                         |
| LowLatencyDefault                           | CBR_HQ          | 1080       | Ultra Low Latency                                     | CBR     | 2                                   | P3                          | 2                                    | P4                           | 2                        | P3               |                  |                         |
| LowLatencyDefault                           | CBR_HQ          | 2160       | Ultra Low Latency                                     | CBR     | 1                                   | P2                          | 1                                    | P2                           | 2                        | P2               |                  |                         |
| LowLatencyDefault                           | CBR_LOWDELAY_HQ | 720        | Low Latency   | CBR     | 2                                   | P4                          | 2                                    | P4                           | 2                        | P4               |                  |                         |
| LowLatencyDefault                           | CBR_LOWDELAY_HQ | 1080       | Low Latency   | CBR     | 2                                   | P3                          | 2                                    | P4                           | 2                        | P3               |                  |                         |
| LowLatencyDefault                           | CBR_LOWDELAY_HQ | 2160       | Low Latency   | CBR     | 1                                   | P2                          | 1                                    | P2                           | 2                        | P2               |                  |                         |
| LowLatencyHQ                                | CBR             | 720        | Low Latency   | CBR     | 0                                   | P4                          | 0                                    | P4                           | 0                        | P4               |                  |                         |
| LowLatencyHQ                                | CBR             | 1080       | Low Latency   | CBR     | 0                                   | P4                          | 0                                    | P4                           | 0                        | P4               |                  |                         |
| LowLatencyHQ                                | CBR             | 2160       | Low Latency   | CBR     | 0                                   | P4                          | 0                                    | P4                           | 0                        | P4               |                  |                         |
| LowLatencyHQ                                | CBR_HQ          | 720        | Ultra Low Latency                                     | CBR     | 2                                   | P4                          | 2                                    | P5                           | 2                        | P4               |                  |                         |
| LowLatencyHQ                                | CBR_HQ          | 1080       | Ultra Low Latency                                     | CBR     | 2                                   | P4                          | 2                                    | P4                           | 2                        | P4               |                  |                         |
| LowLatencyHQ                                | CBR_HQ          | 2160       | Ultra Low Latency                                     | CBR     | 1                                   | P4                          | 1                                    | P4                           | 2                        | P4               |                  |                         |
| LowLatencyHQ                                | CBR_LOWDELAY_HQ | 720        | Low Latency   | CBR     | 2                                   | P4                          | 2                                    | P5                           | 2                        | P4               |                  |                         |
| LowLatencyHQ                                | CBR_LOWDELAY_HQ | 1080       | Low Latency   | CBR     | 2                                   | P4                          | 2                                    | P4                           | 2                        | P4               |                  |                         |
| LowLatencyHQ                                | CBR_LOWDELAY_HQ | 2160       | Low Latency   | CBR     | 1                                   | P4                          | 1                                    | P4                           | 2                        | P4               |                  |                         |
| BD  | VBR             | 720        | High Quality  | VBR     | 0                                   | P4                          | 0                                    | P4                           | 0                        | P4               | frameIntervalP 3 | outputseiBufferPeriod 1 |
| BD  | VBR             | 1080       | High Quality  | VBR     | 0                                   | P4                          | 0                                    | P4                           | 0                        | P4               | idr period 30    | outputseiPictureTime 1  |
| BD  | VBR             | 2160       | High Quality  | VBR     | 0                                   | P4                          | 0                                    | P4                           | 0                        | P4               | gop length 30    | outputAud 1             |
| BD  | VBR_HQ          | 720        | High Quality  | VBR     | 1                                   | P5                          | 1                                    | P5                           | 2                        | P5               |                  | basref 0                |
| BD  | VBR_HQ          | 1080       | High Quality  | VBR     | 1                                   | P5                          | 1                                    | P5                           | 2                        | P5               |                  | sliceMode 3             |
| BD  | VBR_HQ          | 2160       | High Quality  | VBR     | 1                                   | P5                          | 1                                    | P5                           | 2                        | P5               |                  | sliceModeData 4         |
| LosslessHP                                  | CQP             | 720        | lossless  | CQP     | X                                   | P2                          | X                                    | P2                           | X                        | X                | frameIntervalP 1 | sliceMode 3             |
| LosslessHP                                  | CQP             | 1080       | lossless  | CQP     | X                                   | P2                          | X                                    | P2                           | X                        | X                | idr period 30    | sliceModeData 1         |
| LosslessHP                                  | CQP             | 2160       | lossless  | CQP     | X                                   | P2                          | X                                    | P2                           | X                        | X                | gop length 30    |                         |
| LosslessDefault                             | CQP             | 720        | lossless  | CQP     | X                                   | P3                          | X                                    | P3                           | X                        | X                |                  |                         |
| LosslessDefault                             | CQP             | 1080       | lossless  | CQP     | X                                   | P3                          | X                                    | P3                           | X                        | X                |                  |                         |
| LosslessDefault                             | CQP             | 2160       | lossless  | CQP     | X                                   | P3                          | X                                    | P3                           | X                        | X                |                  |                         |



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