



# NVIDIA TensorRT

API Reference | NVIDIA Docs

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# Chapter 1. Added, Deprecated, And Removed APIs

## 1.1. API Changes For TensorRT 8.5.1

The following tables show which APIs were added, deprecated, and removed for the NVIDIA® TensorRT™ 8.5.1 release.

### C++ changes

Table 1. New C++ API Functions

New C++ API Functions
<a href="#"><u>ITensor::setDimensionName()</u></a>
<a href="#"><u>ITensor::getDimensionName()</u></a>
<a href="#"><u>IResizeLayer::setCubicCoeff()</u></a>
<a href="#"><u>IResizeLayer::getCubicCoeff()</u></a>
<a href="#"><u>IResizeLayer::setExcludeOutside()</u></a>
<a href="#"><u>IResizeLayer::getExcludeOutside()</u></a>
<a href="#"><u>IBuilderConfig::setPreviewFeature()</u></a>
<a href="#"><u>IBuilderConfig::getPreviewFeature()</u></a>
<a href="#"><u>ICudaEngine::getTensorShape()</u></a>
<a href="#"><u>ICudaEngine::getTensorDataType()</u></a>
<a href="#"><u>ICudaEngine::getTensorLocation()</u></a>
<a href="#"><u>ICudaEngine::isShapeInferenceIO()</u></a>
<a href="#"><u>ICudaEngine::getTensorIOMode()</u></a>
<a href="#"><u>ICudaEngine::getTensorBytesPerComponent()</u></a>
<a href="#"><u>ICudaEngine::getTensorComponentsPerElement()</u></a>

## New C++ API Functions

<a href="#"><u>ICudaEngine::getTensorFormat()</u></a>
<a href="#"><u>ICudaEngine::getTensorFormatDesc()</u></a>
<a href="#"><u>ICudaEngine::getProfileShape()</u></a>
<a href="#"><u>ICudaEngine::getNbIOTensors()</u></a>
<a href="#"><u>ICudaEngine::getIOTensorName()</u></a>
<a href="#"><u>IExecutionContext::getTensorStrides()</u></a>
<a href="#"><u>IExecutionContext::setInputShape()</u></a>
<a href="#"><u>IExecutionContext::getTensorShape()</u></a>
<a href="#"><u>IExecutionContext::setTensorAddress()</u></a>
<a href="#"><u>IExecutionContext::getTensorAddress()</u></a>
<a href="#"><u>IExecutionContext::setInputTensorAddress()</u></a>
<a href="#"><u>IExecutionContext::getOutputTensorAddress()</u></a>
<a href="#"><u>IExecutionContext::inferShapes()</u></a>
<a href="#"><u>IExecutionContext::setInputConsumedEvent()</u></a>
<a href="#"><u>IExecutionContext::getInputConsumedEvent()</u></a>
<a href="#"><u>IExecutionContext::setOutputAllocator()</u></a>
<a href="#"><u>IExecutionContext::getOutputAllocator()</u></a>
<a href="#"><u>IExecutionContext::getMaxOutputSize()</u></a>
<a href="#"><u>IExecutionContext::setTemporaryStorageAllocator()</u></a>
<a href="#"><u>IExecutionContext::getTemporaryStorageAllocator()</u></a>
<a href="#"><u>IExecutionContext::enqueueV3()</u></a>
<a href="#"><u>IExecutionContext::setPersistentCacheLimit()</u></a>
<a href="#"><u>IExecutionContext::getPersistentCacheLimit()</u></a>
<a href="#"><u>IExecutionContext::setNvtxVerbosity()</u></a>
<a href="#"><u>IExecutionContext::getNvtxVerbosity()</u></a>
<a href="#"><u>INetworkDefinition::addOneHot()</u></a>
<a href="#"><u>INetworkDefinition::addNonZero()</u></a>
<a href="#"><u>INetworkDefinition::addGridSample()</u></a>
<a href="#"><u>INetworkDefinition::addNMS()</u></a>

Table 2. New C++ API Classes

New C++ API Classes
<a href="#"><u>IOneHotLayer</u></a>
<a href="#"><u>IGridSampleLayer</u></a>
<a href="#"><u>INonZeroLayer</u></a>
<a href="#"><u>INMSLayer</u></a>
<a href="#"><u>IOutputAllocator</u></a>

Table 3. New C++ API Enum Values

New C++ API Enum Values
<a href="#"><u>InterpolationMode::kCUBIC</u></a>
<a href="#"><u>FillOperation::kRANDOM_NORMAL</u></a>
<a href="#"><u>BuilderFlag::kREJECT_EMPTY_ALGORITHMS</u></a>
<a href="#"><u>BuilderFlag::kENABLE_TACTIC_HEURISTIC</u></a>
<a href="#"><u>TacticSource::kJIT_CONVOLUTIONS</u></a>
<a href="#"><u>DataType::kUINT8</u></a>

Table 4. New C++ API Enum Classes

New C++ API Enum Classes
<a href="#"><u>TensorIOMode</u></a>
<a href="#"><u>PreviewFeature</u></a>

## Python changes

Table 5. New Python API Functions and Properties

New Python API Functions and Properties
<a href="#"><u>ITensor.set_dimension_name()</u></a>
<a href="#"><u>ITensor.get_dimension_name()</u></a>
<a href="#"><u>IResizeLayer.cubic_coeff</u></a>
<a href="#"><u>IResizeLayer.exclude_outside</u></a>
<a href="#"><u>IBuilderConfig.set_preview_feature()</u></a>
<a href="#"><u>IBuilderConfig.get_preview_feature()</u></a>

## New Python API Functions and Properties

<code>ICudaEngine.get_tensor_shape()</code>
<code>ICudaEngine.get_tensor_dtype()</code>
<code>ICudaEngine.get_tensor_location()</code>
<code>ICudaEngine.is_shape_inference_io()</code>
<code>ICudaEngine.get_tensor_mode()</code>
<code>ICudaEngine.get_tensor_bytes_per_component()</code>
<code>ICudaEngine.get_tensor_components_per_element()</code>
<code>ICudaEngine.get_tensor_format()</code>
<code>ICudaEngine.get_tensor_format_desc()</code>
<code>ICudaEngine.get_tensor_profile_shape()</code>
<code>ICudaEngine.num_io_tensors</code>
<code>ICudaEngine.get_tensor_name()</code>
<code>IExecutionContext.get_tensor_strides()</code>
<code>IExecutionContext.set_input_shape()</code>
<code>IExecutionContext.get_tensor_shape()</code>
<code>IExecutionContext.set_tensor_address()</code>
<code>IExecutionContext.get_tensor_address()</code>
<code>IExecutionContext.infer_shapes()</code>
<code>IExecutionContext.set_input_consumed_event()</code>
<code>IExecutionContext.get_input_consumed_event()</code>
<code>IExecutionContext.set_output_allocator()</code>
<code>IExecutionContext.get_output_allocator()</code>
<code>IExecutionContext.get_max_output_size()</code>
<code>IExecutionContext.temporary_allocator</code>
<code>IExecutionContext.execute_async_v3()</code>
<code>IExecutionContext.persistent_cache_limit</code>
<code>IExecutionContext.nvtx_verbosity</code>
<code>INetworkDefinition.add_one_hot()</code>
<code>INetworkDefinition.add_non_zero()</code>
<code>INetworkDefinition.add_grid_sample()</code>
<code>INetworkDefinition.add_nms()</code>



Table 6. New Python API Classes

New Python API Classes
<a href="#"><u>IOneHotLayer</u></a>
<a href="#"><u>IGridSampleLayer</u></a>
<a href="#"><u>INonZeroLayer</u></a>
<a href="#"><u>INMSLayer</u></a>
<a href="#"><u>IOutputAllocator</u></a>

Table 7. New Python API Enum Values

New Python API Enum Values
<a href="#"><u>InterpolationMode.CUBIC</u></a>
<a href="#"><u>FillOperation.RANDOM_NORMAL</u></a>
<a href="#"><u>BuilderFlag.REJECT_EMPTY_ALGORITHMS</u></a>
<a href="#"><u>BuilderFlag.ENABLE_TACTIC_HEURISTIC</u></a>
<a href="#"><u>TacticSource.JIT_CONVOLUTIONS</u></a>
<a href="#"><u>DataType.UINT8</u></a>

Table 8. New Python API Enum Classes

New Python API Enum Classes
<a href="#"><u>TensorIOMode</u></a>
<a href="#"><u>PreviewFeature</u></a>

## 1.2. API Changes For TensorRT 8.4.1

The following tables show which APIs were added, deprecated, and removed for the NVIDIA® TensorRT™ 8.4.1 release.

### Python changes

Table 9. New Python APIs

New Python APIs
<a href="#"><u>TacticSource::kEDGE_MASK_CONVOLUTIONS</u></a>

## 1.3. API Changes For TensorRT 8.4.0 EA

The following tables show which APIs were added, deprecated, and removed for the NVIDIA® TensorRT™ 8.4.0 EA release.

### C++ changes

Table 10. New C++ APIs

New C++ APIs
<code>setMemoryPoolLimit (IBuilderConfig::setMemoryPoolLimit)</code>
<code>getMemoryPoolLimit (IBuilderConfig::getMemoryPoolLimit)</code>
<code>MemoryPoolType</code>
<code>setMaxThreads (IBuilder::setMaxThreads, IRefitter::setMaxThreads, IRuntime::setMaxThreads)</code>
<code>getMaxThreads (IBuilder::getMaxThreads, IRefitter::getMaxThreads, IRuntime::getMaxThreads)</code>
<code>getBuilderPluginRegistry</code>

Table 11. Deprecated C++ APIs

Deprecated C++ APIs
<code>IFullyConnectedLayer</code>
<code>getMaxWorkspaceSize</code>
<code>setMaxWorkspaceSize</code>

### Python changes

Table 12. New Python APIs

New Python APIs
<code>set_memory_pool_limit</code>
<code>get_memory_pool_limit</code>
<code>MemoryPoolType</code>
<code>max_threads</code> property ( <code>Builder.max_threads</code> , <code>Refitter.max_threads</code> , <code>Runtime.max_threads</code> )

**New Python APIs**[get\\_builder\\_plugin\\_registry](#)

Table 13. Depreciated Python APIs

**Deprecated Python APIs**

IFullyConnectedLayer

get\_max\_workspace\_size

set\_max\_workspace\_size

## 1.4. API Changes For TensorRT 8.2.0 EA

The following tables show which APIs were added, deprecated, and removed for the NVIDIA<sup>®</sup> TensorRT™ 8.2.0 EA release.

### C++ changes

Table 14. New C++ APIs

**New C++ APIs**[IAssertionLayer](#)[IConditionLayer](#)[IEinsumLayer](#)[IScatterLayer](#)

### Python changes

Table 15. New Python APIs

**New Python APIs**[IAssertionLayer](#)[IConditionLayer](#)[IEinsumLayer](#)[IScatterLayer](#)

## 1.5. API Changes For TensorRT 8.0.1

The following tables show which APIs were added, deprecated, and removed for the TensorRT 8.0.1 release.

### C++ changes

Table 16. New C++ APIs

New C++ APIs
<code>class IDequantizeLayer</code>
<code>class IQuantizeLayer</code>
<code>class ITimingCache</code>
<code>IBuilder::buildSerializedNetwork()</code>
<code>IBuilderConfig::getTimingCache()</code>
<code>IBuilderConfig::setTimingCache()</code>
<code>IGpuAllocator::reallocate()</code>
<code>INetworkDefinition::addDequantize()</code>
<code>INetworkDefinition::addQuantize()</code>
<code>INetworkDefinition::setWeightsName()</code>
<code>IPluginRegistry::deregisterCreator()</code>
<code>IRefitter::getMissingWeights()</code>
<code>IRefitter::getAllWeights()</code>
<code>IRefitter::setNamedWeights()</code>
<code>IResizeLayer::getCoordinateTransformation()</code>
<code>IResizeLayer::getNearestRounding()</code>
<code>IResizeLayer::getSelectorForSinglePixel()</code>
<code>IResizeLayer::setCoordinateTransformation()</code>
<code>IResizeLayer::setNearestRounding()</code>
<code>IResizeLayer::setSelectorForSinglePixel()</code>
<code>IScaleLayer::setChannelAxis()</code>
<code>enum ResizeCoordinateTransformation</code>
<code>enum ResizeMode</code>
<code>BuilderFlag::kSPARSE_WEIGHTS</code>

New C++ APIs
<a href="#">TacticSource::kCUDNN</a>
<a href="#">TensorFormat::kDLA_HWC4</a>
<a href="#">TensorFormat::kDLA_LINEAR</a>
<a href="#">TensorFormat::kHWC16</a>

Table 17. Removed C++ APIs

Removed C++ APIs
<b>Core Library</b>
DimensionType
Dims::Type
class DimsCHW
class DimsNCHW
class IOutputDimensionFormula
class IPlugin
class IPluginFactory
class IPluginLayer
class IRNNLayer
IBuilder::getEngineCapability()
IBuilder::allowGPUFallback()
IBuilder::buildCudaEngine()
IBuilder::canRunOnDLA()
IBuilder::createNetwork()
IBuilder::getAverageFindIterations()
IBuilder::getDebugSync()
IBuilder::getDefaultDeviceType()
IBuilder::getDeviceType()
IBuilder::getDLACore()
IBuilder::getFp16Mode()
IBuilder::getHalf2Mode()
IBuilder::getInt8Mode()
IBuilder::getMaxWorkspaceSize()
IBuilder::getMinFindIterations()

## Removed C++ APIs

<code>IBuilder::getRefittable()</code>
<code>IBuilder::getStrictTypeConstraints()</code>
<code>IBuilder::isDeviceTypeSet()</code>
<code>IBuilder::reset()</code>
<code>IBuilder::resetDeviceType()</code>
<code>IBuilder::setAverageFindIterations()</code>
<code>IBuilder::setDebugSync()</code>
<code>IBuilder::setDefaultDeviceType()</code>
<code>IBuilder::setDeviceType()</code>
<code>IBuilder::setDLACore()</code>
<code>IBuilder::setEngineCapability()</code>
<code>IBuilder::setFp16Mode()</code>
<code>IBuilder::setHalf2Mode()</code>
<code>IBuilder::setInt8Calibrator()</code>
<code>IBuilder::setInt8Mode()</code>
<code>IBuilder::setMaxWorkspaceSize()</code>
<code>IBuilder::setMinFindIterations()</code>
<code>IBuilder::setRefittable()</code>
<code>IBuilder::setStrictTypeConstraints()</code>
<code>ICudaEngine::getWorkspaceSize()</code>
<code>IMatrixMultiplyLayer::getTranspose()</code>
<code>IMatrixMultiplyLayer::setTranspose()</code>
<code>INetworkDefinition::addMatrixMultiply()</code>
<code>INetworkDefinition::addPlugin()</code>
<code>INetworkDefinition::addPluginExt()</code>
<code>INetworkDefinition::addRNN()</code>
<code>INetworkDefinition::getConvolutionOutputDimensionsFormula()</code>
<code>INetworkDefinition::getDeconvolutionOutputDimensionsFormula()</code>
<code>INetworkDefinition::getPoolingOutputDimensionsFormula()</code>
<code>INetworkDefinition::setConvolutionOutputDimensionsFormula()</code>
<code>INetworkDefinition::setDeconvolutionOutputDimensionsFormula()</code>
<code>INetworkDefinition::setPoolingOutputDimensionsFormula()</code>

Removed C++ APIs
<code>ITensor::getDynamicRange()</code>
<code>TensorFormat::kNHWC8</code>
<code>TensorFormat::NCHW</code>
<code>TensorFormat::kNC2HW2</code>
Caffe Parser
<code>class IPluginFactory</code>
<code>class IPluginFactoryExt</code>
<code>setPluginFactory()</code>
<code>setPluginFactoryExt()</code>
UFF Parser
<code>class IPluginFactory</code>
<code>class IPluginFactoryExt</code>
<code>setPluginFactory()</code>
<code>setPluginFactoryExt()</code>

Table 18. Removed Plugins

Removed Plugins
<code>class INvPlugin</code>
<code>createLReLUPlugin()</code>
<code>createClipPlugin()</code>
<code>PluginType</code>
<code>struct SoftmaxTree</code>

For plugins based on `IPluginV2DynamicExt` and `IPluginV2IOExt`, certain methods with legacy function signatures (derived from `IPluginV2` and `IPluginV2Ext` base classes) which were deprecated and marked for removal in TensorRT 8.0 will no longer be available. Plugins using these interface methods must stop using them or implement the versions with updated signatures, as applicable.

Table 19. Unsupported plugin methods removed in TensorRT 8.0

Removed Plugins
<code>IPluginV2DynamicExt::canBroadcastInputAcrossBatch()</code>
<code>IPluginV2DynamicExt::isOutputBroadcastAcrossBatch()</code>

Removed Plugins
<code>IPluginV2DynamicExt::getTensorRTVersion()</code>
<code>IPluginV2IOExt::configureWithFormat()</code>
<code>IPluginV2IOExt::getTensorRTVersion()</code>

Table 20. Updated versions for supported plugin methods

Removed Plugin	Replaced with
	<code>IPluginV2DynamicExt::configurePlugin()</code>
	<code>IPluginV2DynamicExt::enqueue()</code>
	<code>IPluginV2DynamicExt::getOutputDimensions()</code>
	<code>IPluginV2DynamicExt::getWorkspaceSize()</code>
	<code>IPluginV2IOExt::configurePlugin()</code>
<code>IPluginV2DynamicExt::supportsFormat()</code>	<code>IPluginV2DynamicExt::supportsFormatCombination()</code>
<code>IPluginV2IOExt::supportsFormat()</code>	<code>IPluginV2IOExt::supportsFormatCombination()</code>

## Python changes

Table 21. New Python APIs

New Python APIs
<code>class IDequantizeLayer</code>
<code>class IQuantizeLayer</code>
<code>class ITimingCache</code>
<code>Builder.build_serialized_network()</code>
<code>IBuilderConfig.get_timing_cache()</code>
<code>IBuilderConfig.set_timing_cache()</code>
<code>IGpuAllocator.reallocate()</code>
<code>INetworkDefinition.add_dequantize()</code>
<code>INetworkDefinition.add_quantize()</code>
<code>INetworkDefinition.set_weights_name()</code>
<code>IPluginRegistry.deregister_creator()</code>
<code>Refitter.get_all_weights()</code>
<code>Refitter.get_missing_weights()</code>
<code>Refitter::set_named_weights()</code>



New Python APIs
<a href="#"><u>IResizeLayer.coordinate_transformation</u></a>
<a href="#"><u>IResizeLayer.nearest_rounding</u></a>
<a href="#"><u>IResizeLayer.selector_for_single_pixel</u></a>
<a href="#"><u>IScaleLayer.channel_axis</u></a>
<a href="#"><u>enum ResizeCoordinateTransformationDoc</u></a>
<a href="#"><u>enum ResizeMode</u></a>
<a href="#"><u>BuilderFlag.SPARSE_WEIGHTS</u></a>
<a href="#"><u>TacticSource.CUDNN</u></a>
<a href="#"><u>TensorFormat.DLA_HWC4</u></a>
<a href="#"><u>TensorFormat.DLA_LINEAR</u></a>
<a href="#"><u>TensorFormat.HWC16</u></a>

Table 22. Removed Python APIs

Removed Python APIs
<b>Core Library</b>
<code>class DimsCHW</code>
<code>class DimsNCHW</code>
<code>class IPlugin</code>
<code>class IPluginFactory</code>
<code>class IPluginLayer</code>
<code>class IRNNLayer</code>
<code>Builder.build_cuda_engine()</code>
<code>Builder.average_find_iterations</code>
<code>Builder.debug_sync</code>
<code>Builder.fp16_mode</code>
<code>IBuilder.int8_mode</code>
<code>Builder.max_workspace_size</code>
<code>Builder.min_find_iterations</code>
<code>Builder.refittable</code>
<code>Builder.strict_type_constraints</code>
<code>ICudaEngine.max_workspace_size</code>
<code>IMatrixMultiplyLayer.transpose0</code>

Removed Python APIs
<code>INetworkDefinition.add_matrix_multiply_deprecated()</code>
<code>INetworkDefinition.add_plugin()</code>
<code>INetworkDefinition.add_plugin_ext()</code>
<code>INetworkDefinition.add_rnn()</code>
<code>INetworkDefinition.convolution_output_dimensions_formula</code>
<code>INetworkDefinition.deconvolution_output_dimensions_formula</code>
<code>INetworkDefinition.pooling_output_dimensions_formula</code>
<code>ITensor.get_dynamic_range()</code>
<code>Dims.get_type()</code>
<code>TensorFormat.HWC8</code>
<code>TensorFormat.NCHW</code>
<code>TensorFormat.NCHW2</code>
Caffe Parser
<code>class IPluginFactory</code>
<code>class IPluginFactoryExt</code>
<code>CaffeParser.plugin_factory</code>
<code>CaffeParser.plugin_factory_ext</code>
UFF Parser
<code>class IPluginFactory</code>
<code>class IPluginFactoryExt</code>
<code>UffParser.plugin_factory</code>
<code>UffParser.plugin_factory_ext</code>

## Deprecated

For our deprecation policy, refer to the [TensorRT Deprecation Policy](#) section in the *TensorRT Developer Guide*.

Table 23. Depreciated APIs

Deprecated APIs	Replaced with
<code>nvinfer1::IResizeLayer::setAlignCorners</code>	<code>nvinfer1::IResizeLayer::setCoordinateTransformation</code>
<code>nvinfer1::IResizeLayer::getAlignCorners</code>	<code>nvinfer1::IResizeLayer::setSelectorForSinglePixel</code>
	<code>nvinfer1::IResizeLayer::setNearestRounding</code>

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## Chapter 2. C++ API

To view this API, refer to the [TensorRT C++ API](#).

The NVIDIA TensorRT C++ API allows developers to import, calibrate, generate and deploy networks using C++. Networks can be imported directly from ONNX. They may also be created programmatically by instantiating individual layers and setting parameters and weights directly.

Within the core C++ API in `NvInfer.h`, the following APIs are included:

- ▶ [Builder API](#)
- ▶ [Execution API](#)
- ▶ [Network Definition API](#)
- ▶ [ONNX Parser API](#)
- ▶ [Plugin API](#)

For more information about the C++ API, including sample code, see [NVIDIA TensorRT Developer Guide](#).

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# Chapter 3. Python API

To view this API, refer to the [TensorRT Python API](#).

The NVIDIA TensorRT Python API enables developers in Python based development environments and those looking to experiment with TensorRT to easily parse models (for example, from ONNX) and generate and run PLAN files.

For more information about the Python API, including sample code, see [NVIDIA TensorRT Developer Guide](#).

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