NVIDIA TensorRT

Support Matrix | NVIDIA Docs

TRM-09025-001 _v8.0.1 | July 2021

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Chapter 1. Features For Platforms And Software

This section lists the supported TensorRT features based on which platform and software.

Table 1. List of supported features per platform.

	Linux x86-64		Windows x64	Linux ppc64le	Linux AArch64
	8.0.0 EA	8.0.x GA	8.0.x	8.0.x	8.0.x
Supported CUDA versions	11.3[1] 11.0 update 1 10.2	11.3 update 1[2] 11.2 update 2[2] 11.1 update 1[2] 11.0 update 1[2] 10.2	11.3 update 1 11.2 update 2 11.1 update 1 11.0 update 1 10.2	11.3 update 1	11.3 update 1 10.2
Supported cuBLAS versions	11.4.2.10064 11.2.0.252 10.2.3.254	11.5.1.109 11.4.1.1043 11.3.0.106 11.2.0.252 10.2.3.254	11.5.1.109 11.4.1.1043 11.3.0.106 11.2.0.252 10.2.3.254	11.5.1.109	11.5.1.109 10.2.2.214
Supported cuDNN versions	cuDNN 8.2.0	cuDNN 8.2.1	cuDNN 8.2.1	cuDNN 8.2.1	cuDNN 8.2.1
TensorRT Python API	Yes	Yes	No	Yes	Yes

[1] This build supports CUDA compute capability 8.6. It is compatible with CUDA 11.1 and CUDA 11.2. User-mode driver compatible with the runtime CUDA version is required and >= 465 is suggested for best performance.

[2] These CUDA versions are supported using a single build, built with CUDA Toolkit 11.3 update 1. It is compatible with all CUDA 11.x (x <= 3) versions and only requires driver 450.x. For future CUDA 11.x (x > 3) versions, the corresponding 11.x driver is required which matches the CUDA Toolkit.

	Linux x86-64		Windows x64	Linux ppc64le	Linux AArch64
	8.0.0 EA	8.0.x GA	8.0.x	8.0.x	8.0.x
NvUffParser	Yes	Yes	Yes	Yes	Yes
NvOnnxParser	Yes	Yes	Yes	Yes	Yes
Loops	Yes	Yes	Yes	Yes	Yes

Note:

- Serialized engines are not portable across platforms or TensorRT versions.
- Refer to the minimum compatible driver versions in the CUDA Release Notes for specific NVIDIA Driver versions.

Chapter 2. Layers And Features

The section lists the supported TensorRT layers and each of the features.

About this task

Note:

- **Supports broadcast** indicates support for broadcast in this layer. This layer allows its two input tensors to be of dimensions [1, 5, 4, 3] and [1, 5, 1, 1], and its output is [1, 5, 4, 3]. The second input tensor has been broadcast in the innermost 2 dimensions.
- **Supports broadcast across batch** indicates support for broadcast across the batch dimension. “NA” in this column means it's not allowed in networks with an implicit batch dimension.

Table 2. List of supported features per TensorRT layer.

Layer	Dimensions of input tensor	Dimensions of output tensor	Does the operation apply to only the innermost 3 dimensions?	Supports broadcast	Supports broadcast across batch
IActivationLayer	0-7 dimensions	0-7 dimensions	No	No	No
IConcatenationLayer	1-7 dimensions	1-7 dimensions	No	No	No
IConstantLayer	has no inputs	0-7 dimensions	No	No	Always
IConvolutionLayer > 2D Convolution	3 or more dimensions	3 or more dimensions	Yes	No	No
IConvolutionLayer > 3D Convolution	4 or more dimensions	4 or more dimensions	No	No	No

Layer	Dimensions of input tensor	Dimensions of output tensor	Does the operation apply to only the innermost 3 dimensions?	Supports broadcast	Supports broadcast across batch
IDeconvolutionLayer > 2D Deconvolution	3 or more dimensions	3 or more dimensions	Yes	No	No
IDeconvolutionLayer > 3D Deconvolution	4 or more dimensions	4 or more dimensions	No	No	No
IDequantizeLayer	2 or more dimensions	2 or more dimensions	Yes	No	No
IElementWiseLayer	0-7 dimensions	0-7 dimensions	No	Yes	Yes
IFillLayer	1 dimension	0-7 dimensions	No	NA	NA
IFullyConnectedLayer	3 or more dimensions	3 or more dimensions	Yes	No	No
IGatherLayer	▶ Input1: 1-7 dimensions ▶ Input2: 0-7 dimensions	0-7 dimensions	No	No	Yes
IIdentityLayer	0-7 dimensions	0-7 dimensions	No	No	No
IIteratorLayer	1-7 dimensions	0-6 dimensions	No	No	NA
ILoopOutputLayer	0-7 dimensions	0-7 dimensions	No	No	NA
ILRNLayer	3 or more dimensions	3 or more dimensions	Yes	No	No
IMatrixMultiplyLayer	2 or more dimensions	2 or more dimensions	No	Yes	Yes
IPaddingLayer	3 or more dimensions	3 or more dimensions	Yes	No	No
IParametricReluLayer	1-7 dimensions	1-7 dimensions	No	No	No
IPluginV2Layer	User defined	User defined	User defined	User defined	User defined
IPoolingLayer > 2D Pooling	3 or more dimensions	3 or more dimensions	Yes	Yes	Yes
IPoolingLayer > 3D Pooling	4 or more dimensions	4 or more dimensions	No	Yes	Yes

Layer	Dimensions of input tensor	Dimensions of output tensor	Does the operation apply to only the innermost 3 dimensions?	Supports broadcast	Supports broadcast across batch
IQuantizeLayer	2 or more dimensions	2 or more dimensions	Yes	No	No
IRaggedSoftMaxLayer	▶ Input: 2 dimensions ▶ Bounds: 2 dimensions	2 or more dimensions	No	No	Yes
IRecurrenceLayer	0-7 dimensions	0-7 dimensions	No	No	NA
IReduceLayer	1-7 dimensions	0-7 dimensions	No	No	No
IResizeLayer	1-7 dimensions	1-7 dimensions	No	No	No
IRNNv2Layer	▶ Data/ Hidden/ Cell: 2 or more dimensions ▶ Seqlen: 0 or more dimensions	Data/Hidden/ Cell: 2 or more dimensions	No	No	No
IScaleLayer	3 or more dimensions	3 or more dimensions	Yes	No	No
ISelectLayer	0-7 dimensions	0-7 dimensions	No	Yes	NA
IShapeLayer	1 or more dimensions	1 dimension	No	No	NA
IShuffleLayer	0-7 dimensions	0-7 dimensions	No	No	No
ISliceLayer	1-7 dimensions	1-7 dimensions	No	No	Yes
ISoftMaxLayer	1-7 dimensions	1-7 dimensions	No	No	Yes
ITopKLayer	1-7 dimensions	▶ Output1: 1-7 dimensions ▶ Output2: 1-7 dimensions	Yes	No	Yes

Layer	Dimensions of input tensor	Dimensions of output tensor	Does the operation apply to only the innermost 3 dimensions?	Supports broadcast	Supports broadcast across batch
ITripLimitLayer	0 dimensions	has no outputs	No	No	NA
IUnaryLayer	1-7 dimensions	1-7 dimensions	No	No	No

For more information about each of the TensorRT layers, see TensorRT Layers.

Chapter 3. Layers And Precision

The section lists the TensorRT layers and the precision modes that each layer supports. It also lists the ability of the layer to run on Deep Learning Accelerator (DLA).
For more information about additional constraints, see DLA Supported Layers.

For more information about each of the TensorRT layers, see TensorRT Layers. To view a list of the specific attributes that are supported by each layer, refer to the TensorRT API documentation.

Table 3. List of supported precision modes per TensorRT layer.

Layer	FP32	FP16	INT8	INT32	DLA FP16	DLA INT8
IActivationLayer	Yes	Yes	Yes	No	Yes[3]	Yes[4]
IConcatenationLayer	Yes	Yes	Yes	Yes	Yes[5]	Yes[5]
IConstantLayer	Yes	Yes	Yes	Yes	No	No
IConvolutionLayer > 2D Convolution	Yes	Yes	Yes	No	Yes	Yes
IConvolutionLayer > 3D Convolution	Yes	Yes	Yes	No	No	No
IDeconvolutionLayer > 2D Deconvolution	Yes	Yes	Yes	No	Yes	Yes[6]
IDeconvolutionLayer > 3D Deconvolution	Yes	Yes	No	No	No	No
IDequantizeLayer	No	No	Yes	No	No	No

[3] Partial support. *Yes* for `ReLU`, `Clipped ReLU`, `Leaky ReLU`, `Sigmoid` and `TanH` activation types only.
[4] Partial support. *Yes* for `ReLU`, `Clipped ReLU`, `Leaky ReLU`, `Sigmoid` and `TanH` activation type only.
[5] Partial support. *Yes* for concatenation across `C` dimension only.
[6] Partial support. *Yes* for ungrouped deconvolutions and *No* for grouped.

Layer	FP32	FP16	INT8	INT32	DLA FP16	DLA INT8
IElementWiseLayer	Yes	Yes	No	Yes	Yes[7]	Yes[8]
IFillLayer	Yes	No	No	Yes	No	No
IFullyConnectedLayer	Yes	Yes	Yes	No	Yes	Yes
IGatherLayer	Yes	Yes	No	Yes	No	No
IIdentityLayer	Yes	Yes	Yes	Yes	No	No
IIteratorLayer	Yes	Yes	No	Yes	No	No
ILoopOutputLayer	Yes	Yes	No	Yes	No	No
IPluginV2Layer	Yes	Yes	Yes	No	No	No
ILRNLayer	Yes	Yes	Yes	No	Yes	No
IMatrixMultiplyLayer	Yes	Yes	No	No	No	No
IPaddingLayer	Yes	Yes	Yes	No	No	No
IParametricReLULayer	Yes	Yes	Yes	No	No	No
IPoolingLayer > 2D Pooling	Yes	Yes	Yes	No	Yes[9]	Yes[9]
IPoolingLayer > 3D Pooling	Yes	Yes	No	No	No	No
IQuantizeLayer	Yes	No	No	No	No	No
IRaggedSoftMaxLayer	Yes	No	No	No	No	No
IRecurrenceLayer	Yes	Yes	No	Yes	No	No
IReduceLayer	Yes	Yes	No	No	No	No
IResizeLayer	Yes	Yes	No	No	No	No
IRNNv2Layer	Yes	Yes	No	No	No	No
IScaleLayer	Yes	Yes	Yes	No	Yes[10]	Yes[10]
ISelectLayer	Yes	Yes	No	Yes	No	No
IShapeLayer[11]	Yes	Yes	Yes	Yes	No	No
IShuffleLayer	Yes	Yes	Yes	Yes	No	No
ISliceLayer	Yes	Yes	No[12]	Yes	No	No
ISoftMaxLayer	Yes	Yes	No	No	No	No
ITopKLayer	Yes	Yes	No	No	No	No

[7] Partial support. *Yes* for `sum`, `sub`, `prod`, `min` and `max` elementwise operations only.
[8] Partial support. *Yes* for `sum` elementwise operation only.
[9] Partial support. *Yes* for `max` and average padding inclusive pooling type only.
[10] Partial support. DLA does not support power on scale layer.
[11] Output is always INT32.
[12] Partial support. *Yes* for unstrided Slice and *No* for strided.

Layer	FP32	FP16	INT8	INT32	DLA FP16	DLA INT8
ITripLimitLayer	Yes	Yes	No	Yes	No	No
IUnaryLayer	Yes	Yes	No	No	No	No

Note: DLA with FP16/INT8 precision with some restrictions on layer parameters.

Chapter 4. Hardware And Precision

The following table lists NVIDIA hardware and which precision modes each hardware supports. TensorRT supports all NVIDIA hardware with capability SM 5.0 or higher. It also lists the availability of Deep Learning Accelerator (DLA) on this hardware. Refer to the following tables for the specifics.

Note: Support for CUDA Compute Capability version 3.0 has been removed. Support for CUDA Compute Capability versions below 5.0 may be removed in a future release and is now deprecated.

Table 4. Supported hardware

CUDA Compute Capability	Example Device	TF32	FP32	FP16	INT8	FP16 Tensor Cores	INT8 Tensor Cores	DLA
8.6	NVIDIA A10	Yes	Yes	Yes	Yes	Yes	Yes	No
8.0	NVIDIA A100/ GA100 GPU	Yes	Yes	Yes	Yes	Yes	Yes	No
7.5	Tesla T4	No	Yes	Yes	Yes	Yes	Yes	No
7.2	Jetson AGX Xavier	No	Yes	Yes	Yes	Yes	Yes	Yes
7.0	Tesla V100	No	Yes	Yes	Yes	Yes	No	No
6.2	Jetson TX2	No	Yes	Yes	No	No	No	No
6.1	Tesla P4	No	Yes	No	Yes	No	No	No
6.0	Tesla P100	No	Yes	Yes	No	No	No	No

CUDA Compute Capability	Example Device	TF32	FP32	FP16	INT8	FP16 Tensor Cores	INT8 Tensor Cores	DLA
5.3	Jetson TX1	No	Yes	Yes	No	No	No	No
5.2	Tesla M4	No	Yes	No	No	No	No	No
5.0	Quadro K2200	No	Yes	No	No	No	No	No

Deprecated hardware

Table 5. List of supported precision mode per hardware.

CUDA Compute Capability	Example Device	FP32	FP16	INT8	FP16 Tensor Cores	INT8 Tensor Cores	DLA
3.7	Tesla K80	Yes	No	No	No	No	No
3.5	Tesla K40	Yes	No	No	No	No	No

Removed hardware

Table 6. List of supported precision mode per hardware.

CUDA Compute Capability	Example Device	FP32	FP16	INT8	FP16 Tensor Cores	INT8 Tensor Cores	DLA
3.0	Tesla K10	Yes	No	No	No	No	No

Chapter 5. Software Versions Per Platform

The section lists the supported software versions based on platform.

Table 7. List of supported platforms per software version.

	Compiler version	Python versions
Ubuntu 16.04 x86-64	gcc 8.3.1	3.5
Ubuntu 18.04 x86-64	gcc 8.3.1	3.6
Ubuntu 20.04 x86-64	gcc 8.3.1	3.8
CentOS 7.9 x86-64	gcc 8.3.1	3.6
CentOS 8.3 x86-64	gcc 8.3.1	3.8
SLES 15 x86-64	gcc 8.3.1	N/A
Windows 10 x64	MSVC 2017u5	N/A
CentOS 8.3 ppc64le	Clang 10.0.1	3.8
Ubuntu 20.04 SBSA	gcc 8.4.0	3.8
JetPack AArch64	gcc 7.5.0	3.6

Note: Python versions supported when using Debian or RPM packages. When using Python wheel files, versions 3.5, 3.6, 3.7, 3.8, and 3.9 are supported.

Chapter 6. Supported Ops

The section lists the operations that are supported in a Caffe or TensorFlow framework and in the ONNX TensorRT parser.

Caffe

These are the operations that are supported in a Caffe framework:

- `BatchNormalization`
- `BNLL`
- `Clip`[13]
- `Concatenation`
- `Convolution`
- `Crop`
- `Deconvolution`
- `Dropout`
- `ElementWise`
- `ELU`
- `InnerProduct`
- `Input`
- `LeakyReLU`
- `LRN`
- `Permute`
- `Pooling`
- `Power`
- `Reduction`
- `ReLU`, `TanH`, and `Sigmoid`
- `Reshape`
- `SoftMax`
- `Scale`

[13] When using the `Clip` operation, Caffe users must serialize their layers using `ditcaffe.pb.h` instead of `caffe.pb.h` in order to import the layer into TensorRT.

TensorFlow

These are the operations that are supported in a TensorFlow framework:

- `Add`, `AddV2`, `AddN`, `Sub`, `Mul`, `Div`, `FloorDiv`, `RealDiv`, `Minimum`, `Maximum`
- `AvgPool`, `AvgPool3D`[14]
- `ArgMin`
- `AvgPool`
- `BiasAdd`
- `Cast`[14]
- `Clip`
- `CombinedNonMaxSuppression`
- `ConcatV2`
- `Const`
- `Conv2D`, `Conv3D`
- `Conv2DBackpropInput`, `Conv3DBackpropInputV2`
- `ConvTranspose2D`
- `DepthToSpace`
- `DepthwiseConv2dNative`
- `Elu`
- `ExpandDims`
- `FusedBatchNorm`, `FusedBatchNormV2`, `FusedBatchNormV3`
- `FusedConv2DBiasActivation`
- `GatherV2`
- `Identity`
- `LeakyReLU`
- `MatMul`, `BatchMatMul`, `BatchMatMulV2`
- `MaxPool`, `MaxPool3D`[14]
- `Mean`
- `Negative`, `Abs`, `Sqrt`, `Recip`, `Rsqrt`, `Pow`, `Exp`, `Log`, `Square`
- `Pad` is supported if followed by one of these TensorFlow layers: `Conv2D`, `DepthwiseConv2dNative`, `MaxPool`, and `AvgPool`.
- `Pack`, `Unpack`
- `ReLU`, `TanH`, `Sigmoid`
- `Relu6`
- `Reshape`

[14] Supported only in TensorFlow 2.0.

- `ResizeBilinear`, `ResizeNearestNeighbor`
- `Sin`, `Cos`, `Tan`, `Asin`, `Acos`, `Atan`, `Sinh`, `Cosh`, `Asinh`, `Acosh`, `Atanh`, `Ceil`, `Floor`
- `Selu`
- `Shape`[14]
- `Slice`, `StridedSlice`
- `SoftMax`

> **Note:** If the input to a TensorFlow `SoftMax` op is not `NHWC`, TensorFlow will automatically insert a transpose layer with a non-constant permutation, causing the UFF converter to fail. It is therefore advisable to manually transpose `SoftMax` inputs to `NHWC` using a constant permutation.

- `Softplus`
- `Softsign`
- `SpaceToDepth`
- `Split`
- `SquaredDifference`
- `Squeeze`
- `TopKV2`
- `Transpose`

For the list of ops supported in UFF, see UFF Operators.

ONNX

Since the ONNX parser is an open source project, the most up-to-date information regarding the supported operations can be found here.

These are the ONNX operators that are supported by TensorRT:

- `Abs`
- `Acos`
- `Acosh`
- `And`
- `Asin`
- `Asinh`
- `Atan`
- `Atanh`
- `Add`
- `ArgMax`
- `ArgMin`

- AveragePool
- BatchNormalization
- Cast
- Ceil
- Celu
- Clip
- Concat
- Constant
- ConstantOfShape
- Conv
- ConvTranspose
- Cos
- Cosh
- CumSum
- DepthToSpace
- DequantizeLinear
- Div
- Dropout
- Elu
- Equal
- Erf
- Exp
- Expand
- EyeLike
- Flatten
- Floor
- Gather
- GatherElements
- Gemm
- GlobalAveragePool
- GlobalLpPool
- GlobalMaxPool
- Greater
- GreaterOrEqual
- GRU
- HardSigmoid

- Identity
- ImageScaler
- InstanceNormalization
- LeakyRelU
- Less
- LessOrEqual
- Log
- LogSoftmax
- Loop
- LpNormalization
- LpPool
- LRN
- LSTM
- MatMul
- Max
- MaxPool
- Mean
- Min
- Mul
- Neg
- Not
- Or
- Pad
- ParametricSoftplus
- Pow
- PRelu
- QuantizeLinear
- RandomUniform
- RandomUniformLike
- Range
- Reciprocal
- ReduceL1
- ReduceL2
- ReduceLogSum
- ReduceLogSumExp
- ReduceMax

- ReduceMean
- ReduceMin
- ReduceProd
- ReduceSum
- ReduceSumSquare
- Relu
- Reshape
- Resize
- ReverseSequence
- RNN
- ScaledTanh
- Scan
- Selu
- Shape
- Sigmoid
- Sin
- Sinh
- Size
- Slice
- Softmax
- SoftmaxCrossEntropyLoss
- Softplus
- Softsign
- SpaceToDepth
- Split
- Sqrt
- Squeeze
- Sub
- Sum
- Tan
- Tanh
- ThresholdedRelu
- Tile
- TopK
- Transpose
- Unsqueeze

- `Upsample`
- `Where`

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