



# NVIDIA Virtual GPU Software Packaging, Pricing, and Licensing Guide

Application Note

# Document History

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| Version | Date               | Authors           | Description of Change  |
|---------|--------------------|-------------------|--|
| 01      | April 22, 2020     | CH, SM            | Initial Release  |
| 02      | May 12, 2020       | CH, SM            | Updates to “Perpetual Concurrent User License” and “NVIDIA Education Pricing Program” sections |
| 03      | June 25, 2020      | CH, RR,<br>MR     | Update NVIDIA Virtual Compute Server subscription price  |
| 04      | July 20, 2020      | NN                | Update NVIDIA Virtual Compute Server abbreviated name  |
| 05      | September 30, 2020 | MR, RR            | Add Ampere GPU support   |
| 06      | February 17, 2021  | MR, VK,<br>NS, SM | Updated new Ampere GPU support, vGPU rebranding changes  |
| 07      | April 14, 2021     | NS, SM            | Added A10 and A16  |

# Table of Contents

- Terminology ..... 1
- Overview ..... 2
  - General Purchasing Information ..... 5
- Virtual GPU Software Product Details ..... 7
  - Virtual GPU Software Products ..... 7
    - NVIDIA vApps ..... 8
    - NVIDIA vPC ..... 8
    - NVIDIA RTX vWS ..... 8
    - NVIDIA Virtual Compute Server ..... 8
  - vGPU Software Products and Entitlement ..... 8
- vGPU Software Licensing and Pricing ..... 11
  - Enterprise vGPU Software Pricing ..... 11
  - Subscription Concurrent User License ..... 11
  - Subscription per GPU User License ..... 12
  - Perpetual Concurrent User License ..... 12
  - NVIDIA Education Pricing Program ..... 13
- Deciding the Right License Based on Capability and Entitlement ..... 14
- NVIDIA vGPU Software License Server ..... 17

## List of Tables

|           |  |    |
|-----------|--|----|
| Table 1.  | Terminology .....  | 1  |
| Table 2.  | NVIDIA Virtual GPU Software Licensed Products.....                   | 2  |
| Table 3.  | Supported NVIDIA Maxwell Graphics Cards .....                        | 3  |
| Table 4.  | Supported NVIDIA Pascal Graphics Cards.....                          | 3  |
| Table 5.  | Supported NVIDIA T4, NVIDIA RTX, and NVIDIA V100 Graphics Cards..... | 4  |
| Table 6.  | Supported NVIDIA Ampere Graphics Cards.....                          | 4  |
| Table 7.  | General Purchasing Information .....                                 | 5  |
| Table 8.  | Feature Entitlements .....   | 9  |
| Table 9.  | Concurrent User License Annual Subscription Pricing .....            | 12 |
| Table 10. | GPU User License Annual Subscription Pricing.....                    | 12 |
| Table 11. | Enterprise Perpetual Licensing plus SUMS Pricing.....                | 12 |
| Table 12. | NVIDIA Education Pricing.....  | 13 |
| Table 13. | Common Use Cases and Solutions .....                                 | 16 |

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# Terminology

The following table lists the terms that will be used throughout this guide.

Table 1. Terminology

| Term                            | Meaning  |
|---------------------------------|--|
| SUMS                            | Support, Upgrade and Maintenance program   |
| Perpetual License               | A non-expiring, permanent software license that can be used on a perpetual basis without the need to renew. SUMS is required and is available in four-year or five-year increments. One-year SUMS available only for renewals. |
| Annual Subscription             | A software license that is active for a fixed period as defined by the terms of the subscription. An annual subscription includes SUMS for the duration of the license term.   |
| License Server                  | An application that manages license allocation, installed on a physical or virtual server.   |
| Concurrent User (CCU) Licensing | A method of allocating licenses based on the number of VMs that are concurrently being used. A CCU license allows only one concurrent VM to be hosted per license.   |
| GPU                             | Graphics processing unit   |
| Per GPU Licensing               | A method of allocating licenses based on the number of GPUs that are being used. A per GPU license allows a certain number of concurrent VMs to be hosted per license.   |

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# Overview

NVIDIA virtual GPU (vGPU) solutions bring the power of NVIDIA GPUs to virtual desktops, applications, and workstations, accelerating graphics and compute to make virtualized workspaces accessible to creative and technical professionals working from home offices or anywhere.

This guide covers the entitlement, packaging, and licensing of the NVIDIA virtual GPU (vGPU) software family of products. It is intended to be a quick reference to understand the product portfolio at a high level, with the corresponding SKU information. It does not contain detailed product information, which can be obtained from the NVIDIA vGPU website at <http://www.nvidia.com/virtualgpu>. This guide is not intended to replace or contradict the End User License Agreement (EULA). Refer to the [EULA](#) for more detailed information.

Table 2. NVIDIA Virtual GPU Software Licensed Products

| Product                               | Description   |
|---------------------------------------|---|
| NVIDIA Virtual Applications (vApps)   | For organizations deploying Citrix Virtual Apps and Desktops, RDSH or other app streaming or session-based solutions. Designed for PC level applications and server-based desktops. |
| NVIDIA Virtual PC (vPC)               | For users who want a virtual desktop but need great user experience leveraging PC Windows applications, browsers, and high-definition video.  |
| NVIDIA RTX™ Virtual Workstation (vWS) | For users who want to be able to use remote professional graphics applications with full performance on any device, anywhere.   |
| NVIDIA Virtual Compute Server (vCS)   | For compute-intensive server workloads, such as artificial intelligence (AI), deep learning, or high-performance computing (HPC).   |

NVIDIA vGPU software brings graphics and virtualization capabilities to NVIDIA data center deployments and is currently supported on the NVIDIA graphics cards listed in Table 3 through Table 6. Find certified servers that are supported by NVIDIA GPUs and vGPU software at <https://www.nvidia.com/en-us/data-center/resources/vgpu-certified-servers/>.

**Table 3. Supported NVIDIA Maxwell Graphics Cards**

|                           | <b>NVIDIA M10</b>                   | <b>NVIDIA M60</b>     | <b>NVIDIA M6</b>     |
|---------------------------|-------------------------------------|-----------------------|----------------------|
| Recommended Use case      | NVIDIA vPC – User Density Optimized | Performance-Optimized | Blade-Optimized      |
| Number of GPUs            | 4 NVIDIA Maxwell™ GPUs              | 2 NVIDIA Maxwell GPUs | 1 NVIDIA Maxwell GPU |
| Total NVIDIA® CUDA® Cores | 2,560 (640 per GPU)                 | 4,096 (2,048 per GPU) | 1,536                |
| Total Memory Size         | 32 GB GDDR5                         | 32 GB GDDR5           | 8 GB GDDR5           |
| (8 GB per GPU)            | 16 GB GDDR5                         | 16 GB GDDR5           |                      |
| (8 GB per GPU)            | 8 GB GDDR5                          | 8 GB GDDR5            |                      |
| Max Power                 | 225 W                               | 300 W                 | 100 W                |

**Table 4. Supported NVIDIA Pascal Graphics Cards**

|                      | <b>NVIDIA P4</b>           | <b>NVIDIA P6</b>                           | <b>NVIDIA P40</b>                                | <b>NVIDIA P100</b>       |
|----------------------|----------------------------|--|--|--------------------------|
| Recommended Use case | NVIDIA vWS (Entry to mid)- | NVIDIA vWS or NVIDIA vPC - Blade-Optimized | NVIDIA vWS - Performance Optimized (Mid to high) | NVIDIA vWS (Mid to high) |
| Number of GPUs       | 1 NVIDIA Pascal GP104      | 1 NVIDIA Pascal GP104                      | 1 NVIDIA Pascal GP102                            | 1 NVIDIA Pascal GP100    |
| Total CUDA Cores     | 2,560                      | 2,048                                      | 3,840  | 3,584                    |
| Total Memory Size    | 8 GB GDDR5                 | 16 GB GDDR5                                | 24 GB GDDR5                                      | 12 GB HBM2/16 GB HBM2    |
| Max Power            | 75 W                       | 90 W                                       | 250 W  | 250 W/300 W              |
| Form Factor          | PCIe 3.0 Single Slot       | MXM  | PCIe 3.0 Dual Slot                               | SXM2/PCIe 3.0            |
| Board Dimensions     | 2.7" × 6.6"                | 3.2" × 4.1"                                | 10.5" × 4.4"                                     | 10.5" × 4.4"             |
| Cooling Solution     | Passive                    | Bare Board                                 | Passive  | Passive                  |

Table 5. Supported NVIDIA T4, NVIDIA RTX, and NVIDIA V100 Graphics Cards

|                         | <b>NVIDIA T4</b>   | <b>NVIDIA RTX 6000</b>   | <b>NVIDIA RTX 8000</b>   | <b>NVIDIA V100S/V100 SXM2</b>                               |
|-------------------------|--|--|--|---|
| Recommended Use case    | NVIDIA vWS - Performance Optimized (Entry); vPC - Density Optimized; vCS - Compute Optimized | NVIDIA vWS - Performance Optimized (High end); vCS - Compute Optimized | NVIDIA vWS - Performance Optimized (High end); vCS - Compute Optimized | NVIDIA vWS - Performance-Optimized; vCS - Compute Optimized |
| Number of GPUs          | 1 NVIDIA Turing™ TU104   | 1 NVIDIA Turing TU102  | 1 NVIDIA Turing TU102  | 1 NVIDIA Volta™ GPU   |
| Total CUDA Cores        | 2,560  | 4,608  | 4,608  | 5,120   |
| Tensor Cores            | 320  | 576  | 576  | 640   |
| NVIDIA® TensorRT™ Cores | 40   | 72   | 72   | --  |
| Total Memory Size       | 16 GB GDDR6  | 24 GB GDDR6  | 48 GB GDDR6  | 32 GB HBM2  |
| Max GPU Power           | 70 W   | 260 W / 250 W  | 260 W / 250 W  | 250 W / 300 W   |
| Form Factor             | PCIe 3.0 Single Slot   | PCIe 3.0 Dual Slot   | PCIe 3.0 Dual Slot   | PCIe, SXM2, Full Height/Length                              |
| Board Dimensions        | 2.7" × 6.6"  | 10.5" × 4.4"   | 10.5" × 4.4"   | 10.5" × 4.4"<br>5.5" × 3.1" × .5"                           |
| Cooling Solution        | Passive  | Active or Passive  | Active or Passive  | Passive   |

Table 6. Supported NVIDIA Ampere Graphics Cards

|                         | <b>NVIDIA HGX A100</b>       | <b>NVIDIA A100</b>      | <b>NVIDIA A40</b>  | <b>NVIDIA A10</b>   |
|-------------------------|------------------------------|-------------------------|--|---|
| Recommended Use case    | vCS - Compute Optimized      | vCS - Compute Optimized | NVIDIA vWS - Performance Optimized (High end); vCS - Compute Optimized | NVIDIA vWS - Performance Optimized (midrange) vCS - Compute Optimized |
| Number of GPUs          | 4 NVIDIA A100/ 8 NVIDIA A100 | 1 NVIDIA A100           | 1 NVIDIA A40   | 1 NVIDIA A10  |
| FP32 Cores / GPU        | 6,912                        | 6,912                   | 10,572   | 9,216   |
| Tensor Cores / GPU      | 432                          | 432                     | 336  | 288   |
| TensorRT Cores          | -                            | -                       | 84   | 72  |
| Total Memory Size / GPU | 40 GB HBM2/80GB HBM2         | 40 GB HBM2              | 48 GB GDDR6  | 24 GB GDDR6   |
| Max GPU Power / GPU     | 400 W                        | 250 W                   | 300 W  | 150 W   |



|                  | NVIDIA HGX A100      | NVIDIA A100             | NVIDIA A40              | NVIDIA A10                |
|------------------|----------------------|-------------------------|-------------------------|---------------------------|
| Form Factor      | 4x SXM4 GPUs/8x SXM4 | PCIe 4.0 Dual-Slot FHFL | PCIe 4.0 Dual-Slot FHFL | PCIe 4.0 Single Slot FHFL |
| Board Dimensions |                      | 10.5" × 4.4"            | 10.5" × 4.4"            | 10.5" × 4.4"              |
| Cooling Solution | Passive              | Passive                 | Passive                 | Passive                   |



**Note:** NVIDIA RTX A6000 and NVIDIA RTX A5000 are also supported with NVIDIA virtual GPU software.

## General Purchasing Information

NVIDIA vGPU software products can be purchased through NVIDIA Preferred Partners and select server OEMs. A list of these Preferred Partners and OEMs can be obtained from: <http://www.nvidia.com/buygrid>.

NVIDIA vGPU software products can be purchased as either a perpetual license with a Support Updates and Maintenance Subscription (SUMS), or as an annual subscription. The perpetual license gives the user the right to use the software indefinitely, with no expiration. All NVIDIA vGPU software products with perpetual licenses must be purchased in conjunction with a four-year, or five-year SUMS. A one-year SUMS is available only for renewals.

The annual subscription offering is a more affordable option to allow IT departments to better manage the flexibility of license volumes. NVIDIA vGPU software products with an annual subscription are bundled with SUMS for the duration of the software's subscription license.

**Table 7. General Purchasing Information**

| Entitlement                  | NVIDIA vGPU Production SUMS   |
|------------------------------|---|
| Maintenance                  | Access to all maintenance releases, defect resolutions, and security patches for flexibility in upgrading as per the NVIDIA Virtual GPU Software Lifecycle Policy |
| Upgrades                     | Access to all new major version releases including feature enhancements and new hardware support  |
| Long-term branch maintenance | Available for up to 3 years from general availability as per the NVIDIA Virtual GPU Software Lifecycle Policy   |
| Direct support               | Direct access to NVIDIA support engineering for timely resolution of customer-specific issues   |
| Support availability         | Customer support available during standard business hours<br>Cases accepted 24 × 7  |
| Knowledgebase access         | ✓   |

| Entitlement    | NVIDIA vGPU Production SUMS |
|----------------|-----------------------------|
| Web support    | ✓                           |
| E-mail support | ✓                           |
| Phone support  | ✓                           |

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# Virtual GPU Software Product Details

NVIDIA vGPU software is the industry's most advanced technology for sharing true virtual GPU hardware acceleration between multiple users—without compromising the graphics experience. This virtualization technology ensures complete application compatibility, which means features and experience are the same as they would be on a physical device.

## Virtual GPU Software Products

NVIDIA vGPU desktop and application virtualization solutions are designed to bring the power of virtualization to the users who need to be their most productive. vGPU technology ensures application compatibility, meaning any application that can run in a physical desktop environment can run in a virtual environment. Organizations can now expand their virtualization footprint without compromise.

The following NVIDIA vGPU software products are available:

- ▶ NVIDIA Virtual Applications (vApps)
- ▶ NVIDIA Virtual PC (vPC)
- ▶ NVIDIA RTX Virtual Workstation (vWS)
- ▶ NVIDIA Virtual Compute Server (vCS)

## NVIDIA vApps

This product is for organizations deploying Citrix Virtual Apps and Desktops, RDSH or other app streaming or session-based solutions. Designed to deliver PC Windows applications at full performance, NVIDIA vApps allows users to access any Windows application at full performance on any device, anywhere.

Windows Server hosted RDSH desktops are also supported by NVIDIA vApps.

## NVIDIA vPC

This product is ideal for users who want a virtual desktop but need great user experience leveraging PC Windows applications, browsers, and high-definition video. NVIDIA vPC delivers a native experience to users in a virtual environment, allowing them to run all their PC applications at full performance.

## NVIDIA RTX vWS

This product is ideal for mainstream and high-end designers who use powerful 3D content creation applications such as Dassault CATIA, SOLIDWORKS, 3DExcite, Siemens NX, PTC Creo, Schlumberger Petrel, or Autodesk Maya. NVIDIA vWS allows users to access their professional graphics applications with full features and performance, anywhere, on any device.

## NVIDIA Virtual Compute Server

This product is for organizations running compute-intensive server workloads such as Artificial Intelligence (AI), Deep Learning (DL), and High-Performance Computing (HPC). NVIDIA Virtual Compute Server (vCS) is software that enables the NVIDIA GPU to be virtualized to accelerate compute-intensive server workloads with features such as error-correcting code (ECC) memory, page retirement, peer-to-peer CUDA transfers over NVIDIA® NVLink®, and multiple vGPUs assigned to a single VM.

## vGPU Software Products and Entitlement

Each NVIDIA vGPU software product includes the feature entitlements listed in Table 8.

Table 8. Feature Entitlements

| Feature   | NVIDIA vApps   | NVIDIA vPC       | NVIDIA vWS       | NVIDIA vCS            |
|---|----------------|------------------|------------------|-----------------------|
| <b>License Entitlement</b>                      |                |                  |                  |                       |
| Concurrent User (CCU)                           | ✓              | ✓                | ✓                |                       |
| Per GPU   |                |                  |                  | ✓ <sup>1</sup>        |
| <b>Capability Entitlement</b>                   |                |                  |                  |                       |
| Desktop Virtualization                          |                | ✓                | ✓                |                       |
| RDSH App Hosting                                | ✓              | ✓                | ✓ <sup>2</sup>   |                       |
| RDSH Desktop Hosting                            | ✓              | ✓                | ✓ <sup>2</sup>   |                       |
| Compute Virtualization                          |                |                  | ✓                | ✓                     |
| Windows Guest OS Support                        | ✓              | ✓                | ✓                |                       |
| Linux Guest OS Support                          |                | ✓                | ✓                | ✓                     |
| Maximum Displays                                | 1 <sup>3</sup> | 4                | 4                | 1                     |
| Maximum Resolution <sup>4</sup>                 | 1280 × 1024    | 5120 × 2880 (5K) | 7680 × 4320 (8K) | 4096 × 2160 (4K)      |
| NVIDIA RTX Enterprise Software Features         |                |                  | ✓                |                       |
| OpenGL, DirectX and Vulkan                      | ✓              | ✓                | ✓                | In-situ Graphics only |
| CUDA and OpenCL Support                         |                |                  | ✓ <sup>5</sup>   | ✓                     |
| ECC and Page Retirement                         |                |                  | ✓                | ✓ <sup>6</sup>        |
| Multi-vGPU                                      |                |                  | ✓                | ✓                     |
| NVLink  |                |                  | ✓                | ✓                     |
| GPU Pass Through Support <sup>7</sup>           | ✓              |                  | ✓                | ✓                     |
| Bare Metal Support <sup>8</sup>                 | ✓              |                  | ✓                |                       |
| <b>vGPU Profile Sizes Supported<sup>9</sup></b> |                |                  |                  |                       |
| 512 MB  |                | ✓                | ✓                |                       |
| 1 GB  | ✓              | ✓                | ✓                |                       |
| 2 GB  | ✓              | ✓                | ✓                |                       |
| 3 GB  | ✓              |                  | ✓                |                       |
| 4 GB  | ✓              |                  | ✓                | ✓                     |
| 5 GB  |                |                  |                  | ✓                     |
| 6 GB  | ✓              |                  | ✓                | ✓                     |
| 8 GB  | ✓              |                  | ✓                | ✓                     |
| 10 GB   |                |                  |                  | ✓                     |
| 12 GB   | ✓              |                  | ✓                | ✓                     |

| Feature | NVIDIA vApps | NVIDIA vPC | NVIDIA vWS | NVIDIA vCS |
|---------|--------------|------------|------------|------------|
| 16 GB   | ✓            |            | ✓          | ✓          |
| 20 GB   |              |            |            | ✓          |
| 24 GB   | ✓            |            | ✓          | ✓          |
| 32 GB   | ✓            |            | ✓          | ✓          |
| 40 GB   |              |            |            | ✓          |
| 48 GB   |              |            | ✓          | ✓          |
| 80 GB   |              |            |            | ✓          |

## Notes:

<sup>1</sup>Maximum 8 concurrent VMs per GPU

<sup>2</sup>With packaged NVIDIA vApps license

<sup>3</sup>Applies only to the console display in remote application environments. For details, see [Supported GPUs](#)

<sup>4</sup>Review the [Virtual GPU Software User Guide](#) for the supported display configurations for each profile

<sup>5</sup>Supported on 8GB 1:1 profile on NVIDIA Maxwell and all profiles on Pascal

<sup>6</sup>ECC support begins with Pascal

<sup>7</sup>Only supported on 1:1 profiles

<sup>8</sup>Only NVIDIA M6 hardware supported as primary display device

<sup>9</sup>Review the [Virtual GPU Software User Guide](#) for the vGPU profiles supported on your GPU

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# vGPU Software Licensing and Pricing

## Enterprise vGPU Software Pricing

NVIDIA vPC, NVIDIA RTX vWS, and NVIDIA vApps are available on a per Concurrent User (CCU) model. A CCU license is required for every user who is accessing or using the software at any given time, whether an active connection to the virtualized desktop or session is maintained.

NVIDIA vCS is available on a per GPU model. A GPU license is required for every GPU that will host vCS-enabled VMs. A single vCS license enables a maximum of 20 concurrent VMs.

NVIDIA vGPU software products can be purchased by enterprises as either perpetual licenses with annual Support Updates and Maintenance Subscription (SUMS), or as an annual subscription. All NVIDIA vGPU software products with perpetual licenses must be purchased in conjunction with a four-year or five-year SUMS. A one-year SUMS is available only for renewals. For annual licenses, SUMS is bundled into the annual license cost.

Enterprise vGPU software licensing and pricing are described in the following subsections. [Find the full SKU list here](#). Pricing is suggested pricing only. Contact your authorized NVIDIA partner for final pricing. If you are looking to run or host a service by using NVIDIA vGPU software, you need to join the [NPN CSP partner program](#).

## Subscription Concurrent User License

An annual Enterprise subscription is active for a fixed period as defined by the terms of the subscription license. To be kept active, the license will need to be renewed at the end of the subscription period. The subscription license includes the software license and production level SUMS for the duration of the license subscription period.

Table 9. Concurrent User License Annual Subscription Pricing

| License                        | Annual Subscription Pricing           |
|--------------------------------|---------------------------------------|
| NVIDIA Virtual Applications    | \$10 per CCU subscription             |
| NVIDIA Virtual PC              | \$50 per CCU subscription             |
|                                | 4 year subscription - \$43.75 per CCU |
|                                | 5 year subscription - \$40 per CCU    |
| NVIDIA RTX Virtual Workstation | \$250 per CCU subscription            |

## Subscription per GPU User License

An annual enterprise subscription is active for a fixed period as defined by the terms of the subscription license. To be kept active, the license will need to be renewed at the end of the subscription period. The subscription license includes the software license and production-level SUMS for the duration of the license subscription period.

Table 10. GPU User License Annual Subscription Pricing

| License                       | Annual Subscription Pricing |
|-------------------------------|-----------------------------|
| NVIDIA Virtual Compute Server | \$150 per GPU subscription  |

## Perpetual Concurrent User License

A perpetual enterprise license allows for use of the licensed software indefinitely. Users that opt to license using this model are required to subscribe to SUMS for four or five years. The SUMS subscription can be renewed on a yearly basis after the expiration of the initial subscription.

Table 11. Enterprise Perpetual Licensing plus SUMS Pricing

| License                        | Annual Licensing plus SUMS Pricing |
|--------------------------------|------------------------------------|
| NVIDIA Virtual Applications    | \$20 per CCU perpetual license     |
|                                | \$5 SUMS per year                  |
| NVIDIA Virtual PC              | \$100 per CCU perpetual license    |
|                                | \$25 SUMS per year                 |
| NVIDIA RTX Virtual Workstation | \$450 per CCU perpetual license    |
|                                | \$100 SUMS per year                |



## NVIDIA Education Pricing Program

The NVIDIA Education Pricing Program supports the use of visual computing in teaching and research institutions. The program makes it easy to procure and administer NVIDIA solutions, software licensing, and services for qualified educational institutions and helps reduce their total cost. For more information on eligibility, review the [NVIDIA Education Pricing Program](#) documentation.

The Annual Subscription Model is available for NVIDIA vWS and vCS. The Perpetual Licensing Model is available only for NVIDIA vWS. Users that opt for the Perpetual Licensing Model are required to subscribe to SUMS for four or five years. The SUMS subscription can be renewed on a yearly basis after the expiration of the initial subscription.

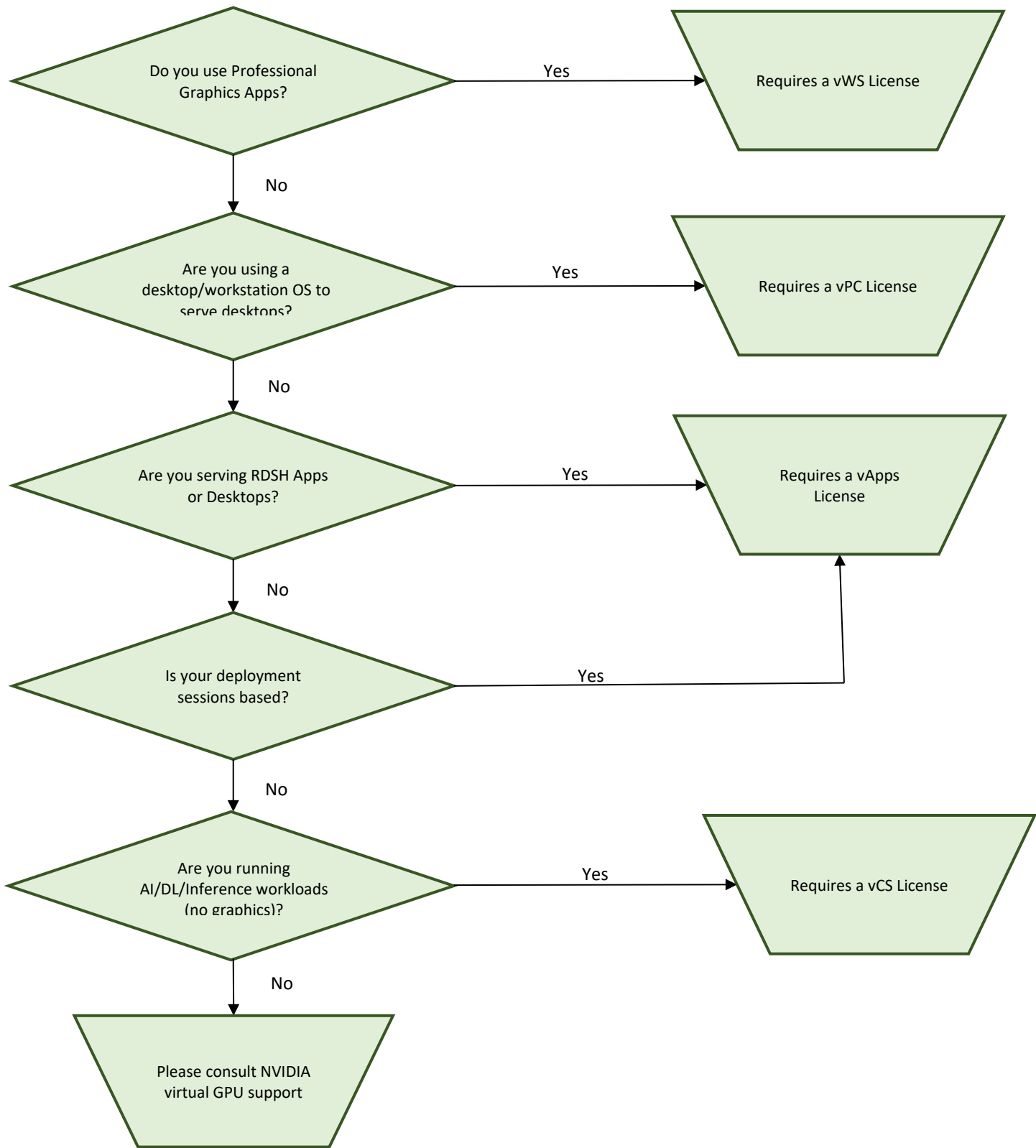
Table 12. NVIDIA Education Pricing

| License                       | Pricing Model                 | Price                          |
|-------------------------------|-------------------------------|--------------------------------|
| NVIDIA vWS                    | Perpetual Licensing plus SUMS | \$99 per CCU perpetual license |
|                               |                               | \$25 SUMS per year             |
|                               | Annual Subscription           | \$50 per CCU subscription      |
| NVIDIA Virtual Compute Server | Annual Subscription           | \$50 per GPU subscription      |

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# Deciding the Right License Based on Capability and Entitlement

The following flowchart provides a simple decision tree to help decide which license is required based on the desired entitlement and capability. If you have further questions or are unable to decide based on the decision tree, contact NVIDIA vGPU Support at <https://www.nvidia.com/en-us/support/enterprise/>.



The following table summarizes some common use cases of different solutions. This is not an all-inclusive list of possible solutions. If you have questions, contact NVIDIA vGPU Support.

**Table 13. Common Use Cases and Solutions**

| I am using...                    | I need this license...   |
|----------------------------------|--|
| Citrix Virtual Desktops          | NVIDIA vPC – for PC level applications<br>NVIDIA vWS – for workstation/professional 3D use cases                         |
| VMware Horizon (View)            | NVIDIA vPC – for PC level applications<br>NVIDIA vWS – for each session utilizing a workstation/professional 3D use case |
| Citrix Virtual Apps and Desktops | NVIDIA vApps<br>NVIDIA vWS – for each session utilizing a workstation/professional 3D use case                           |
| VMware Horizon RDSH              | NVIDIA vApps<br>NVIDIA vWS – for each session utilizing a workstation/professional 3D use case                           |
| Other RDSH / Session-based       | NVIDIA vApps<br>NVIDIA vWS – for each session utilizing a workstation/professional 3D use case                           |
| Microsoft RemoteFX               | NVIDIA vPC – for PC level applications   |
| VMware Horizon vSGA              | NVIDIA vPC – for PC level applications   |
| Microsoft Hyper-V (DDA)          | NVIDIA vWS   |
| Red Hat KVM                      | vCS – for AI/DL/Inference workloads<br>NVIDIA vWS – for workstation/professional 3D use cases                            |

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# NVIDIA vGPU Software License Server

The NVIDIA vGPU software license server provides monitoring and reporting on license usage for capacity planning. It is available for download with the vGPU software packages from the NVIDIA Licensing Portal. This license server can be installed on either a physical server or, more likely, a dedicated virtual machine.

To ensure that the end user experience is not impaired by license overages or connection issues, the vGPU software runs with or without a valid license server connection. The license server allows the IT administrator to track license usage and determine correct sizing for their environments. In compliance with the EULA, IT administrators may also use any other method that reliably tracks the software usage to ensure they have enough licenses for their CCU or per GPU usage.

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