

(beginning in BIG-IP 13.0.0 HF1)	8 ⁴	N.A.	N.A.	12 ⁴	N.A.	N.A.	8 ⁴	8 ⁴	N.A.	8 ⁴	8 ⁴	8 ⁴	8 ⁴	8 ⁴
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¹With the introduction of the Good Bundle license, the BIG-IP LTM standalone module license is subsumed under this bundle license and has the same license limits.

²The BIG-IP DNS standalone module license is licensed by a rate-limited license, based on the number of DNS request resolutions per second, instead of the maximum allowed throughput rate license.

³The VNF Better and VNF Best bundles includes the BIG-IP PEM module.

⁴These are the limits allowed by the respective base licenses. In versions earlier than BIG-IP 13.1.0.1, you can increase this limit to a maximum of 16 vCPUs. Beginning in BIG-IP 13.1.0.1, you can increase this limit to a maximum of 24 vCPUs through add-on licenses.

⁵For more information about BIG-IP APM licensing, refer to [K95135311: BIG-IP APM licensing for BIG-IP Virtual Edition instances](#).

For example, a new Better Bundle license for a maximum allowed throughput of 1 Gbps BIG-IP VE is limited with a maximum throughput rate of 1 Gbps, and this throughput rate limits a maximum allowed vCPU of four. If you provision the BIG-IP VE with eight vCPUs in the hypervisor, the BIG-IP VE only recognizes four of the eight provisioned vCPU, and allows a maximum of four TMM threads to run.

Existing BIG-IP VE licenses are not enforced with the maximum allowed vCPU and continue to be licensed for only their maximum allowed throughput rate, regardless of the BIG-IP VE version.

Note: Clone pool traffic counts against the maximum allowed throughput rate licensed on the BIG-IP VE system.

Note: Prior to the introduction of the Good, Better, Best licensing, BIG-IP VE did not have vCPU enforcement and allowed you to configure eight vCPUs in the hypervisor. This applies to licenses issued or purchased prior to 2014, when Good-Better-Best licensing was introduced. You can use the following command from the command line to see if you are running a license that places restrictions on the number of provisioned vCPUs allowed: `tmsh show sys license detail | grep perf_VE_cores`. If you are running a new license, you see output similar to the following: `perf_VE_cores [8]`. If no output is reported, your system is using a license prior to 2014.

Licensing and provisioning restrictions

With the introduction of the Good, Better, Best licensing options, the BIG-IP VE provisioning limitations do not change. While more than two modules may be licensed on the device, you cannot provision all modules at the same time. Refer to the release notes of each BIG-IP VE version for the memory requirements of multi-module provisioned **BIG-IP VE** system. The following table indicates, for the listed Base VE, whether a module may be provisioned using the following:

- **(Y)** The module is included. For example, CGN is already included in the AFM module.
- **(O)** The module is available as an option.
- **(N.A.)** The module is not available.

Base VE	Optional Modules											
	LTM	Better	Best	ASM	AWAF	AFM	AAM	APM	CGN	BPPEM	PEM	DNS
Good	Y	O	O	O	O	O	N.A.	O	O	O	O	O
Better	Y	Y	O	N.A.	N.A.	Y	Y	Y ³	Y	N.A.	O	Y
Best	Y	Y	Y	Y	O	Y	Y	Y	Y	N.A.	O	Y

ASM	O	N.A.	N.A.	Y	O	O	N.A.	O	N.A.	N.A.	N.A.	N.A.
LTM+ASM	Y	N.A.	N.A.	Y	O	O	N.A.	O	O	N.A.	O	O
AWAF	O	N.A.	N.A.	Y	Y	O	N.A.	O	N.A.	N.A.	N.A.	N.A.
AFM	O	N.A.	N.A.	O	O	Y	N.A.	O	Y	O	O	O
AAM	O	N.A.	N.A.	N.A.	N.A.	N.A.	Y	N.A.	N.A.	N.A.	N.A.	N.A.
APM	O	N.A.	N.A.	N.A.	O	O	N.A.	Y	N.A.	N.A.	N.A.	O ²
CGN	O	N.A.	N.A.	N.A.	N.A.	O	N.A.	N.A.	Y	O	O	N.A.
BPEM	Y	N.A.	N.A.	N.A.	N.A.	O	N.A.	N.A.	O	Y	N.A.	O
PEM	Y	N.A.	N.A.	N.A.	N.A.	O	N.A.	N.A.	O	N.A.	Y	O
DNS	N.A.	N.A.	N.A.	N.A.	N.A.	O	N.A.	N.A.	N.A.	N.A.	N.A.	Y
LAB	Y	Y ¹	Y ¹	Y	Y ²	Y	Y	Y	Y	N.A.	N.A.	Y
SP LAB	N.A.	N.A.	N.A.	N.A.	Y ²	Y	N.A.	Y	Y	N.A.	Y	Y

¹LAB licenses purchased before December 22, 2016 include all of the Better and Best modules except for the advanced routing and multicast features. LAB licenses purchased after December 22, 2016 include the advanced routing and multicast features.

²Supported on Version Plus licenses. For more information about this license type, refer to [K15643: BIG-IP VE license offerings](#).

Note: When you add a module to a BIG-IP LTM license, the number of vCPU added are either the maximum allowed vCPU for the BIG-IP LTM module or the maximum allowed vCPU for the added module, whichever is larger. For example, if you currently have a 1 Gbps BIG-IP LTM license and you add a 1 Gbps PEM module, four vCPU are added since the PEM module has a four vCPU maximum while the BIG-IP LTM (Good) module has a two-vCPU maximum.

For more information about the new F5 licensing options, refer to the [Maximize the Value of Your Enterprise Application Delivery](#) document.

³In the Better licensing option, when you add the BIG-IP LTM module, the BIG-IP LTM system includes a free perpetual license for the BIG-IP APM Limited (formerly APM Lite) module. To use the full features of the BIG-IP APM system, you can purchase the Best licensing option. For more information about APM Limited, refer to [K15854: BIG-IP APM Limited \(formerly APM Lite\)](#).

BIG-IP Per-App VE restrictions

The BIG-IP Per-App VE (introduced in BIG-IP 13.1.0.1) is designed to integrate into single application stacks for application services in private clouds. It is currently available in throughput licenses and modules as described in the following table. The BIG-IP Per-App VE has restrictions on its configuration; it allows only one virtual address with up to a maximum of three virtual servers.

Note: For BIG-IP 13.1.0.x, the three virtual-server-maximum quota per virtual address is reached when a single wildcard virtual server is configured. Beginning in BIG-IP 13.1.1, a wildcard virtual server is only counted as a single virtual server against the maximum of three virtual servers for the virtual IP address.

Note: The AWS Cloud version of the BIG-IP 13.1.0.7 image is available on the [MyF5 Downloads](#) page. This version is modified so that a wildcard virtual server is counted as only a single virtual server in relation to the maximum of three virtual servers per virtual address.

Additionally, the BIG-IP Per-App VE has the same throughput and vCPU restrictions as the standard VE license.

Maximum allowed throughput rate licensed	Maximum allowed vCPU	
	LTM	WAF
25 Mbps	2	2
200 Mbps	2	4

Hypervisor throughput limitations and restrictions

Several factors may impact the throughput limitations and restrictions for BIG-IP VE, such as the chosen hypervisor vendor, version, hardware, and F5 license. For throughput limitations and restrictions, refer to the ***Virtual Edition and Supported Hypervisors Matrix***.

Note: For information about how to locate F5 product manuals, refer to [K98133564: Tips for searching MyF5 and finding product documentation](#).

Recommendations

If you require more TMM threads to run on BIG-IP VE, you can increase the maximum allowed vCPU by purchasing the license type that fits your vCPU requirements. For information about purchasing your VE license, contact your F5 sales representative.

Note: For BIG-IP VE configurations that support multiple vCPUs, the supported numbers of vCPUs are one, two, or a multiple of four. TMM only uses vCPUs configured in these supported multiples (1, 2, 4, 8, 12, 16, 20, and so on). If you configure an unsupported multiple of vCPUs (6, 10, 18, 22, and so on), TMM only uses up to the supported number of vCPUs. For example, if you configure the BIG-IP VE to allocate six vCPUs, TMM only uses four vCPUs, and the remaining two vCPUs are not used.

Related Content

- [K6475: Overview of SSL TPS licensing limits](#)
- [K15831: How the BIG-IP VE system enforces the licensed throughput rate](#)
- [K14946: Overview of BIG-IP VE image sizes](#)
- [K9245: Verifying that a BIG-IP license is valid](#)
- [K14356: Determining the maximum allowed throughput rate on the BIG-IP VE system](#)
- [K15796: Hardware requirements to host BIG-IP VE on private cloud platforms](#)
- [K15667: Advance End of Sale/End of Life announcement for BIG-IP Virtual Edition licenses](#)
- [K95135311: BIG-IP APM licensing for BIG-IP Virtual Edition instances](#)
- The [F5 Public Cloud Integrations](#) page
- ***BIG-IP Virtual Edition Setup Guide for Citrix XenServer***
- ***BIG-IP Virtual Edition Setup Guide for Linux Xen Project***
- ***BIG-IP Virtual Edition Setup Guide for Linux KVM***
- ***BIG-IP Virtual Edition Setup Guide for Microsoft Hyper-V***
- ***BIG-IP Virtual Edition Setup Guide for VMware ESXi***
- ***BIG-IP Virtual Edition Setup Guide for VMware vCloud Director***

Note: For information about how to locate F5 product manuals, refer to [K98133564: Tips for searching MyF5 and finding product documentation](#).

F5 support engineers who work directly with customers write Support Solution and Knowledge articles, which give you immediate access to mitigation, workaround, or troubleshooting suggestions.