

# Thunder Software for Bare Metal

## Your Choice of Hardware

A10 Networks application networking and security solutions for bare metal raise the bar on performance with an industry-leading software approach. The software enables on-demand deployment with commercial off-the-shelf (COTS) hardware to deliver agile and scalable solutions.

## High-performance Software for the Modern Data Center

Exploding consumer IP traffic is forcing fundamental changes in the way networks are designed and services are delivered securely.

The A10 Thunder® for Bare Metal product line offers high-performance software to manage the high demands of today's application networking and security workloads.

By building software atop their choice of standardized COTS hardware, organizations gain significant benefits. Dynamic provisioning and faster rollout of services, along with on-demand scaling, make Thunder for Bare Metal a leading form factor for service providers and enterprises.

Thunder for Bare Metal software includes Thunder ADC and Thunder CGN solutions.

Thunder ADC for Bare Metal provides scalable application delivery and server load balancing to enable applications to be highly available, accelerated and secure.

Thunder CGN for Bare Metal is a unique offering that allows service providers and enterprises to extend IPv4 connectivity and transition to IPv6.

The bare metal offering is also available as a part of A10 on Dell technologies OEM bundles—single service platform (SSP), using purpose-built Dell Technologies hardware.

### Solutions



Application Delivery Controller (ADC)



Carrier-Grade Networking (CGN)

### Related Products



A10 on Dell Technologies OEM Bundle

# Features and Benefits

## Unparalleled Performance

Bare metal software deployments benefit from greater performance by avoiding the hypervisor overhead associated with virtualized solutions, as they have direct and complete access to the underlying hardware. In addition, A10 Thunder for Bare Metal is powered by A10's Advanced Core Operating System (ACOS®), which delivers shared memory accuracy, efficiency, scalability and advanced flow processing. It offers up to 40 Gbps of throughput in a single bare metal software appliance.

## Off-the-shelf Hardware for Lower TCO

Moving to software-based network functions, running on industry-standard hardware, helps lower CAPEX and OPEX costs. A10's solutions for bare metal can be deployed on COTS-standardized hardware, reducing the need to purchase traditional proprietary hardware platforms.

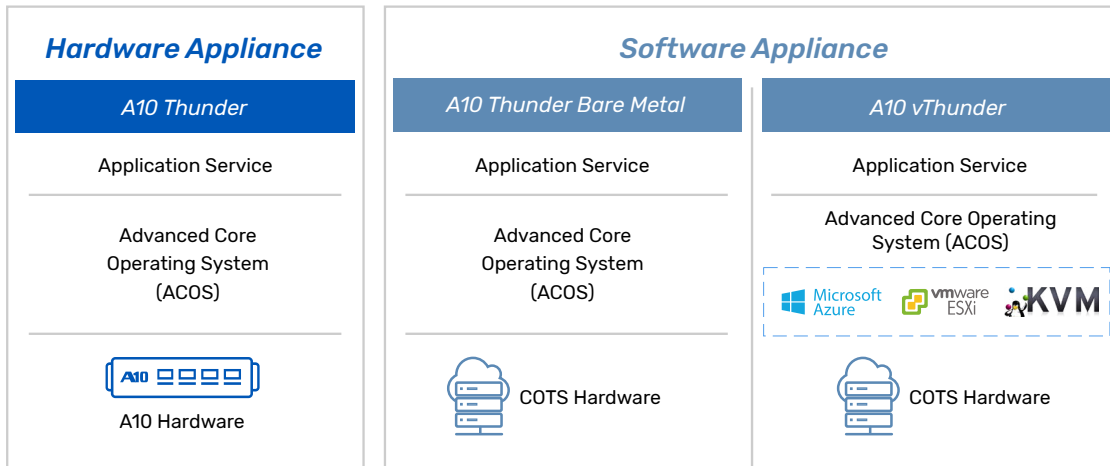
## Faster Time to Operation

Thunder for Bare Metal software is available as an ISO image or through a Preboot Execution Environment (PXE) deployment for x86 server platforms and clouds. The software can be downloaded and installed onto an organization's existing commodity hardware on demand. The software is an integrated package, enabling faster system rollout.

## Deployment Flexibility

Decouple software licensing from hardware to ensure portability and longevity. Hardware can be upgraded independent of software to lower costs. Enterprises and service providers can deploy application networking and security solutions as a VNF in software-defined networking (SDN) and software-defined data center (SDDC) environments for centralized management and automation.

### Form Factor Comparison



Flexible Form Factors to Suit Any Application Need

# Software Support



## Fully Featured

Designed to accelerate service agility for enterprises and service providers, A10 Thunder application networking and security solutions for bare metal leverages the same high-performance architecture, advanced features and familiar interface of ACOS, which powers A10 Thunder hardware appliances to deliver feature parity between hardware and bare metal options.



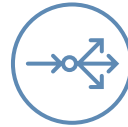
## No Feature Licenses

Thunder for Bare Metal software appliances come with all features included for the software version selected. Licenses are only regulated by the bandwidth. An all-inclusive, full-featured licensing model helps ensure flexibility and simplified operations with predictable CAPEX and OPEX.



## API Control

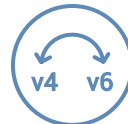
Simplify and automate management tasks with easy-to-use, industry-standard CLI, a web user interface and a RESTful API (aXAPI®), which integrates with custom or third-party management consoles. Full RESTful API control enables DevOps and SecOps efficiency, as needed.



## Application Delivery and Load Balancing

Thunder ADC for Bare Metal lets you optimize, accelerate and secure applications. Scale your web and infrastructure servers seamlessly to ensure business continuity, accelerate applications for efficient operations and protect infrastructure for uninterrupted services.

Thunder ADC for Bare Metal offers open programmability, improves visibility and accelerates service integration for the most demanding workloads.



## CGNAT and IPv4/IPv6 Transition

Thunder CGN for Bare Metal mitigates IPv4 address exhaustion by extending the life of an IPv4 network infrastructure with advanced carrier-grade network address translation (CGNAT) functions and simultaneously manages the transition to IPv6.

When needed, service providers and enterprises can take advantage of server performance upgrades and avoid business disruptions due to IPv4/IPv6 compatibility issues.

# Performance Comparison

## Thunder Bare Metal vs. Virtualized Server

A10 bare metal application networking solutions overcome several performance limitations found with typical virtualized software solutions. Bare metal software enables applications to run directly on the hardware unencumbered by other software, which reduces latency and improves performance.

A10 and Intel published a joint [white paper](#)<sup>1</sup> on how software-defined infrastructure (SDI) on bare metal boosts performance. The paper showcases how Thunder ADC software on Intel-based bare metal servers can deliver up to double the number of L4 connections per second than KVM virtualized servers.

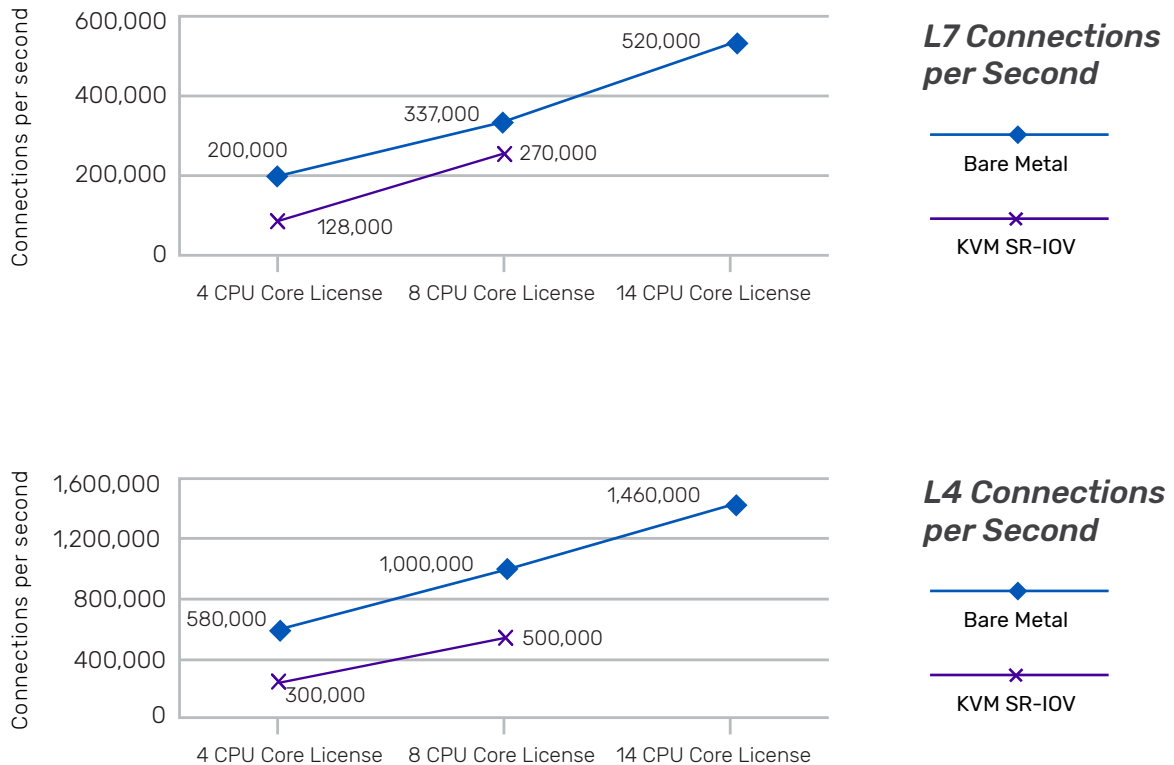


Figure 1: Performance comparison between bare metal and KVM SR-IOV.<sup>1</sup>

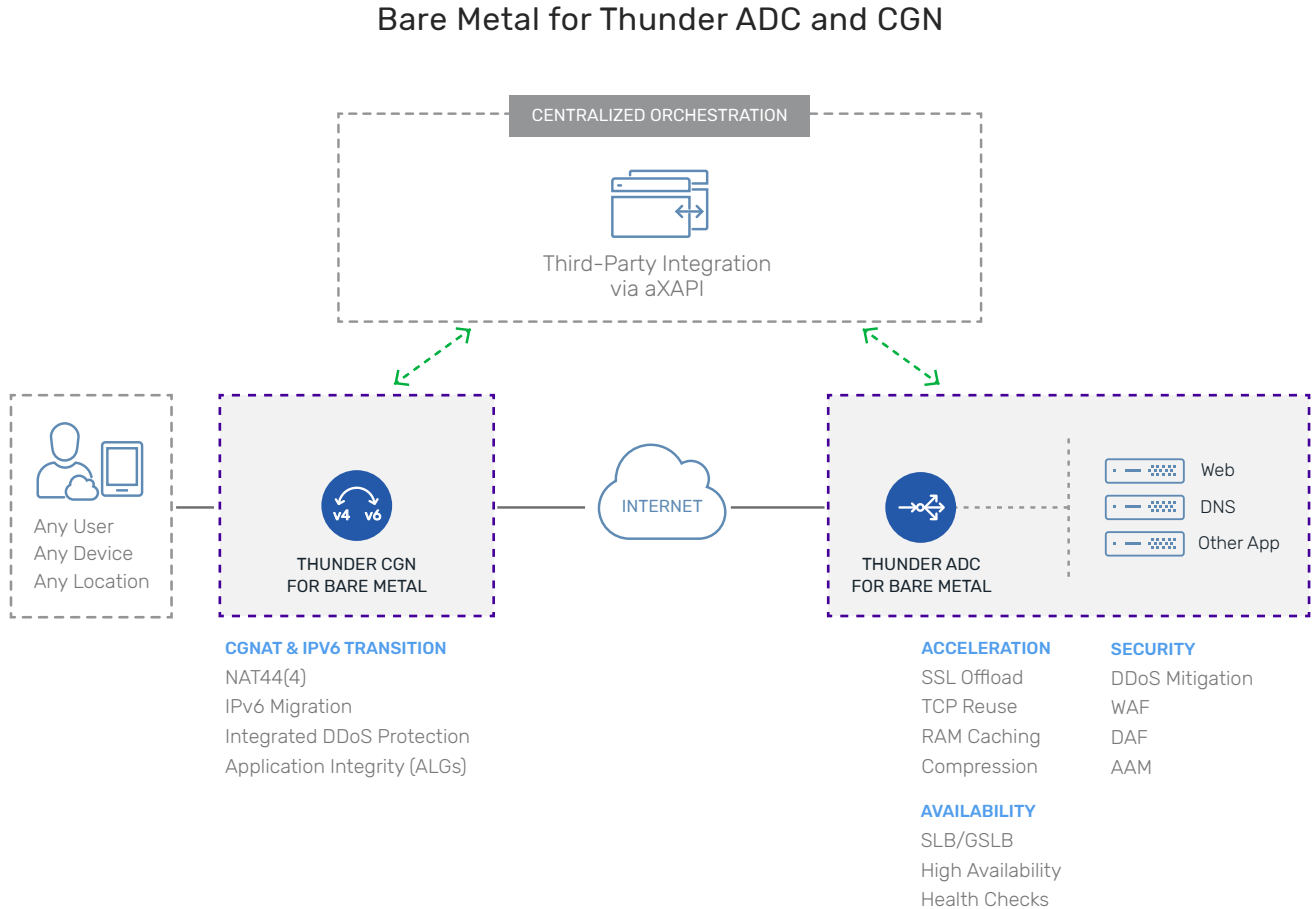
<sup>1</sup> Source: [A10networks.com/sites/default/files/A10-ADC-WP-Software-Defined\\_Infrastructure\\_on\\_Bare\\_Metal\\_Boosts\\_Performance.pdf](https://www.a10networks.com/sites/default/files/A10-ADC-WP-Software-Defined_Infrastructure_on_Bare_Metal_Boosts_Performance.pdf).

## Use Cases

Service providers, enterprises and web hosting operations are ideal environments that can leverage the flexibility afforded by bare metal software appliances to support I/O-heavy and compute-intensive workloads. The following table highlights key Thunder for Bare Metal use cases.

<i>Use Case</i>	<i>Need</i>	<i>Outcome</i>
<b>Standardized COTS Hardware</b>	Build full-featured application networking solutions on standard COTS hardware.	Implement advanced application networking on customer-chosen COTS hardware. The software-based solution delivers the performance required for heavy workloads that are I/O-heavy and compute-intensive. It's fully programmable using A10's open API for automated service deployments in NFV, SDN and SDDC environments.
<b>Build a Hybrid Environment</b>	Deploy high-compute hybrid clouds with software or hardware.	Thunder application networking and security solutions offer the flexibility to build high-powered hybrid cloud environments to the performance levels your data center and application demands while aligning with your core business strategy. Seamlessly manage workloads across software (e.g., bare metal, virtualized) and hardware (e.g., appliance) solutions.
<b>Gain Multi-tenancy in Software</b>	Gain multi-tenancy capabilities in bare metal.	Thunder for Bare Metal software appliances provide fully featured functionality that is tied to a dedicated server. However, service providers and enterprises can isolate traffic and administration for multi-tenancy use by leveraging application delivery partitions (ADP), which offer up to 32 partitions per server while maintaining bare metal's dedicated performance benefits.
<b>Offer Better Services to Customers</b>	Stay competitive by offering tiered pricing models.	Stay competitive with A10's bare metal solution to expand service offerings and support premium, higher-tiered pricing models. Service providers can offer shared COTS hardware and bare metal software using multi-tenancy for small- and medium-sized customer environments. For a premium service, and more demanding workloads, dedicated COTS hardware and bare metal software can be offered.

# Reference Architecture



**CGNAT & IPV6 TRANSITION**

- NAT44(4)
- IPv6 Migration
- Integrated DDoS Protection
- Application Integrity (ALGs)

<p><b>ACCELERATION</b></p> <ul style="list-style-type: none"> <li>SSL Offload</li> <li>TCP Reuse</li> <li>RAM Caching</li> <li>Compression</li> </ul> <p><b>AVAILABILITY</b></p> <ul style="list-style-type: none"> <li>SLB/GSLB</li> <li>High Availability</li> <li>Health Checks</li> </ul>	<p><b>SECURITY</b></p> <ul style="list-style-type: none"> <li>DDoS Mitigation</li> <li>WAF</li> <li>DAF</li> <li>AAM</li> </ul>
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\*Varies by product

**Figure 2:** In this scenario, a service provider deploys architecture that leverages A10 Thunder ADC for Bare Metal and Thunder CGN for Bare Metal for application delivery, load balancing and carrier-grade networking solutions.

# Thunder for Bare Metal Software Appliances

Thunder ADC/CGN for Bare Metal	
System Requirements	Minimum Hardware Requirement: Intel x86-based CPUs with minimum of 4 cores, 16 GB RAM, 80 GB of free disk space, 2 Ethernet interfaces (3 or more are recommended), Intel Network Adapters and drivers including igb, ixgbe, and i40e. For more details, see Installation Guide.
Referenced Platforms	Dell Power Edge, Cisco UCS, SuperMicro, HP ProLiant and Ericsson HDS and more
Bandwidth Licenses*	10 Gbps (4 cores), 20 Gbps (8 cores), 40 Gbps (14 cores) and 60 Gbps (24 cores) FlexPool
Standard Warranty	90-day Software

\*Licenses are tied with maximum number of cores, which can be allocated to ACOS.

## Thunder ADC for Bare Metal\*\*

ADC Performance	40 Gbps (14 Cores)
Throughput	40 Gbps
L4 Connections per second	2.4 Million
L7 Connections per second	650 K

## Thunder CGN for Bare Metal\*\*

CGN Performance	40 Gbps (14 Cores)
Throughput	40 Gbps
Packets per second	20 M
Concurrent sessions	128 M

\*\*Specifications for test environment. Tested on Intel Xeon CPU E5-2699 v3 @ 2.30 GHz, Intel Ethernet Controller XL710 (10 GbE ports, i40e driver) with 132 GB memory, Intel SSD S3510 480 GB, OS version ACOS 4.1.4.

# A10 Thunder on Dell Technologies OEM Solution Bundle

## Single Service Platform (SSP) Specifications

The SSP range consists of A10's cloud-ready software and purpose-built Dell Technologies hardware, with an inclusive license\*\*\* that has the capabilities of delivering Application Delivery Controller (ADC), SSL Insight (SSLi), and Carrier Grade Networking (CGN) solutions along with an expanded feature set of A10 capabilities.

	Dell Technologies VEP4600	Dell Technologies R640		Dell Technologies R740	
		10GE NIC Model	100GE NIC Model	10GE NIC Model	100GE NIC Model
ADC L4 Throughput	10 Gbps	40 Gbps	60 Gbps	75 Gbps	100 Gbps
CGN Throughput	12 Gbps	30 Gbps	60 Gbps	60 Gbps	100 Gbps

\*\*\*A10 Thunder on Dell Technologies OEM bundle solutions are licensed under the Convergent Firewall (CFW) license. Check with your A10 Networks sales representative for the latest information on full feature testing and validation.

For more details, refer to [A10networks.com/partners/technology-partners/dell/](https://a10networks.com/partners/technology-partners/dell/).

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