

Introduction

Ampere® Altra® processors are designed from the ground up to deliver exceptional performance for Cloud Native workloads. With an innovative architecture that delivers high performance, linear scalability, and amazing energy efficiency, Ampere Altra allows workloads to run in a predictable manner with minimal variance under increasing loads. This enables industry leading performance/watt and a smaller carbon footprint for real workloads.

One of the core tenets of the cloud is multitenancy – the ability to share computing resources among multiple customers with quality. VMware® ESXi is a leader among hypervisors for its efficient architecture, performance, and support. VMware ESXi Fling provides architects the ability to evaluate this technology on AArch64 processors such as the Ampere Altra. This guide outlines the steps required to deploy and configure VMware ESXi on the Ampere Altra family of processors.

Minimum Hardware Requirements

The following hardware is required:

- An Ampere Altra-based system
- 1x USB drive for installer ISO
- 1x USB, or NVMe (NVM Express) drive for actual ESXi installation
- 1x USB or PCIe NIC

The following hardware is supported:

- USB and NVMe storage
- SB and PCIe networking
- VGA video and USB keyboards
- Serial Console

Installing VMware ESXi-ARM

Depending on the server make and model, there is usually more than one way to install ESXi-ARM.

- 1. Console access:
- VGA + USB keyboard
- BMC (Baseboard Management Controllers) web interface for VGA + USB keyboard
- BMC serial port redirection via IPMI
- 2. Booting:
- ESXi installer on USB key
- ISO vía virtual media redirection

Steps for Installing ESXi-ARM on your Ampere Altra-based Systems

- 1. Get a working console (via IPMI, BMC KVM, VGA, etc).
- 2. Power on the system.
- 3. When prompted, choose the boot option (USB or Virtual Media).



- 4. Follow the generic installation steps listed below.
- After the boot option is selected, you will see the "Loading ESXi installer" window.

Loading /EFI/B00T/boot.cfg Loading /EFI/B00T/crypto64.efi Loading /b.b00 Loading /jumpstrt.gz Loading /useropts.gz Loading /features.gz Loading /features.gz Loading /procfs.b00 Loading /vmx.v00

		Loading ESXi	installer	
-0				
Loading	/nvmxnet3.v00			
Loading	/nvmxnet3.v01			
Loading	/pvscsi.v00			
Loading	/qcnic.v00			
Loading	/gedentv.v00			
Loading	/gedrntv.v00			
Loading	/qfle3.v00			
Loading	/qfle3f.v00			
Loading	/qfle3i.v00			
Loading	/qflge.v00			
Loading	/rste.v00			
Loading	/sfvmk.v00			
Loading	/smartpqi.v00			
Loading	/vmkata.v00			
Loading	/vmkfcoe.v00			
Load ing	/vmkusb.v00			
Loading	/vmw_ahci.v00			
Loading	/elx_esxv00			
Loading	/btldr.v00			
Load ing	/esx_dvfi.v00			
Loading	/esx_ui.v00			
Loading	/esxupdt.v00			
Loading	/tpmesxup.v00			
Loading	/weaselin.v00			
Loading	/loadesx.v00			
Loading	/1suv2_hp.v00			
Loading	/1suv2_in.v00			
Loading	/lsuv2_ls.v00			
Loading	/lsuv2_nv.v00			
Loading	/1suv2_oe.v00			
Loading	/lsuv2_oe.v01			
Loading	/1suv2_oe.v02			
Loading	/1suv2_sm.v00			
Loading	/native_m.v00			
Loading	/qlnative.v00			
Loading	/vmware_e.v00			
Loading	/vsan.v00			

Loading ESXi installer

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• While the installer is loading all the necessary modules, it will display the server configuration information at the top as shown below.



• Since this is a new installation of ESXi-ARM, press "Enter" to continue.

VMware ESXi on Arm Fling Installer
Welcome to the VMware ESXi on Arm Fling Installation
VMware ESXi on Arm Fling installs on most ServerReady-like systems, but only a few chosen systems are "officially" supported.
For more info, see https://communities.vmware.com/communit y/vmtn/beta/vsphere-betaprogram/esxi-on-arm-fling
Select the operation to perform. (Esc) Cancel (Enter) Continue



• Read and accept the EULA by pressing F11.



VMware ESXi-ARM will display all the available disk groups. Choose the Disk where you would like to install the ESXi-ARM.

	Select a Disk to Insta	11 or Upgrade	
(any e	xisting VMFS-3 will be automat	ically upgraded to VMF	S-5)
* Contains	a VMFS partition		
# Claimed	by VMware vSAN		5
Storage De	vice		Capacity
Local:			
NVMe	HFS1T9GD0FEI-A43 (t10.NVMe_	HFS1T9GD0FE12)	1.75 TiB
Remote: (none)			



• Confirm that you are ready to start the installation process.

(i	Select a Disk to Install or Upgrade any existing VMFS-3 will be automatically upgraded to VMFS	6-5)		
* Con # Cla	Confirm Disk Selection			
Stora	You have selected a disk that contains at least one			
Local	partition with existing data.			
NV	If you continue the selected disk will be overwritten.	5 T i		
Remot (n	(Esc) Cancel (Enter) OK			

• Select the keyboard layout and continue.

	Please :	select	a keyl	poard]	layout	
Swiss Swiss Turkis US Def US Dvo Ukrain United	French German h ault orak ian I Kingdom					
	Use the	е аггои	keys	to scr	oll.	
(Eco)	Cancel	(F9)	Back	(Ent	er) Co	nt inue



• Enter a root password which fulfills the ESXi-ARM password criteria.

VMware ESX	i on Arm Flin	g Installer
En	ter a root pa	ssword
Root password: **** Confirm password: *****	*** ***_	
	Passwords mat	ch.
(Esc) Cancel	(F9) Back	(Enter) Continue

• Confirm that you are ready to start the installation process on the disk selected above.

VMware ESXi on Arm Fling Installer				
(Confirm Install			
The installer is confi t10.NVMeHFS1T9GD0FE12	igured to insta 2DA430A 2EE4AC.	II ESXI-A	rm 7.0.0 on: 6D26770500	
Warning: This disk will be repartitioned.				
(Esc) Cancel	(F9) Back	(F11)	Install	

• The installation process takes a few minutes. While the ESXi-ARM is getting installed, it will display a progress bar as shown below.

	VMware ESXi on Arm Fling]	Installer
5	Installing ESXi-Arm	7.0.0
	68 %	
1		0



• Once the installation is complete, you will get the following message that will prompt you to remove the installation media and then reboot.



After the reboot you will see the screen below. This screen shows that the ESXi-ARM has been successfully installed on your Ampere Altra server and is now ready to be configured.

VMware ESXi on Arm Fling (VMKernel Release Build 20133114) See https://blogs.vmware.com/arm/ for tips, tricks and more Note: THIS TECH PREVIEW IS NOT A PRODUCT

GIGABYTE R272-P30-00

ARM Limited Neoverse N1 r3p1 127.6 GiB Memory

To manage this host, go to: https://snow218/ https://10.76.235.219/ (DHCP) https://[fe80::2a0:c9ff:fe00:0]/ (STATIC)



Configuring Your ESXi-ARM Server

- On the console window, Press "F2".
- On the prompt enter the root credentials.

VMware ESXi on Arm Fling (VMKernel Release Build 20133114) See https://blogs.vmware.com/arm/ for tips, tricks and more Note: THIS TECH PREVIEW IS NOT A PRODUCT						
GIGABYTE R272-P30-00						
ARM Limited Neoverse N1 r3p1 127.6 GiB Memory						
Ĩ	Authentication Required Enter an authorized login name and password for					
-	Configured Keyboard (US Default)					
lo manage this host, go to https://snow218/ https://10.76.235.219/ (DH https://[fe80::2a0:c9ff:fe	Password: [] (Enter> OK (Esc> Cance]					
<f2> Customize Sustem/View </f2>	ogs <pre></pre> <p< td=""></p<>					

To setup your network configuration, go to "Configure Management Network" option and press "Enter".





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• Press "Enter" on "Network Adapters" to select the NIC you want to use for your Management Network.

Configure Management Network	Network Adapters	
Network Adapters VLAN (optional) IPv4 Configuration IPv6 Configuration DNS Configuration Custom DNS Suffixes	vmnic0 (Ethernet Controller 1) The adapters listed here provide the default network connection to and from this host. When two or more adapter are used, connections will be fault-tolerant and outgoing traffic will be load-balanced.	`S
<pre>KUp/Down> Select</pre>	KEnter> Change KEsc> Ex	cit
VMware ESXi 7.0.0 (VMK	ernel Release Build 20133114)	

Select the NIC you want to use by pressing space (which toggles the selection), and press "Enter".

Configure Management Network	Network Adapters
Network Adapters VLAN (optional) IPv4 Configuration IPv6 Configuration DNS Configuration Custom DNS Suffixes	vmnic0 (Ethernet Controller 1) The adapters listed here provide the default network connection to and from this host. When two or more adapters are used, connections will be fault-tolerant and outgoing traffic will be load-balanced.
Network Adapters Select the adapters for th connection. Use two or more load-balancing.	s host's default management network adapters for fault-tolerance and
Device NameHardware[X] vmnic0Ethernet[] vmnic1Ethernet(D> View Details <space> Tele</space>	abel (MAC Address) Status co (00:00:00) Connected () co (00:00:01) Disconnected aggle Selected <enter> OK <esc> Cancel</esc></enter>
<up down=""> Select</up>	Enter> Change
VMware ESXi 7.0.0	(VMKernel Release Build 20133114)



• Configure the Management Network as per your requirements. You can set either a static IP address or a dynamic IP address for your ESXi-ARM host. Press "Enter" after you have completed the selection.



There are other options you have on the Network Configuration page; depending on how your network is provisioned you can configure your server's network accordingly. ESXi-ARM also has support for IPv6. You can also set up up your vLAN tag, DNS configuration (commonly, it is automatically filled when you select the DHCP (Dynamic Host Control Protocol) option).

Configure Management Network	IPv6 Configuration	
Network Adapters VLAN (optional) IPv4 Configuration IPv6 Configuration DNS Configuration Custom DNS Suffixes	IPv6 is enabled. Automatic IPv6 Addresses: fe80::2a0:c9ff:fe00:0/64 Default Gateway: Not set	
	This host can obtain IPv6 addresses and other network includes server or supports Router Advertisement.	orking a DHCPv6
KUp/Down> Select	(Enter) Change	(Esc) Exit
VMware ESXi 7.0.0 (VMKern	el Release Build 20133114)	

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• To Test the network configuration of your ESXi-ARM server, choose the "Test Management Network" option and press "Enter".

System Customization	Test Management Network
Configure Password Configure Lockdown Mode Configure Management Network Restart Management Network Test Management Network Test Management Network Network Restore Options Configure Keyboard Troubleshooting Options View System Logs View Support Information	To perform a brief network test, press (Enter). By default, this test will attempt to ping the configured default gateway, ping the configured primary and alternate DNS servers, and resolve the configured hostname.
Reset System Configuration	
<pre>KUp/Down> Select</pre>	Kenter> Run Test Kesc> Log Out
VMware ESXi 7.0.0 (VMKer	nel Release Build 20133114)

• You might get IP values pre-populated in the pop-up windows, on which you can run a ping test again. It is recommended that you use your vLAN Gateway IP address, DHCP server IP address, and an external IP address (if you have Internet access to the server).

System Customization		Test Management Network	
Configure Password Configure Lockdown Mode Configure Management Network Restart Management Network Test Management Network Network Restore Options Configure Keyboard Troubleshooting Options View System Logs		To perform a brief network test, By default, this test will attemp default gateway, ping the configu DNS servers, and resolve the conf	press <enter>. t to ping the configured red primary and alternate igured hostname.</enter>
Vieu Support Information – Reset System Configuration	Test Management Network By default, this test will attemp and DNS servers, and resolve your Ping Address #0: [] Ping Address #1: [] Ping Address #2: [] Resolve Hostname []] <up down=""> Select</up>	pt to ping your default gateway r hostname. 9.76.235.1] 9.76.109.2] 9.76.99.2] 8.scc-lab.amperecomputing.com] Center> OK (Esc) Cancel	
<up down=""> Select</up>			<esc> Log Out</esc>
	VMware ESXi 7.0.0 (VMKern	el Release Build 20133114)	



• Press "Enter" to run the test. All the outputs should come as "OK".

System Customization		Test Management Network	
Configure Password Configure Lockdown Mode Configure Management Networ Restart Management Networ Test Management Network Network Restore Options Configure Keyboard Troubleshooting Options View System Logs View Support Information	ork k Testing Management Network	To perform a brief network test, p By default, this test will attempt default gateway, ping the configur DNS servers, and resolve the confi	ress <enter>. to ping the configured ed primary and alternate gured hostname.</enter>
Reset System Configuratio	You may interrupt the test at any		
	Pinging address #1 (10.76.235.1). Pinging address #2 (10.76.100.2). Pinging address #3 (10.76.99.2). Resolving hostname (snow210.scc-lab	OK. OK. OK. anpereconputing.con). Failed. (Enter) OK	
<up down=""> Select</up>	<enter≻ ru<="" td=""><td></td><td><esc> Log Out</esc></td></enter≻>		<esc> Log Out</esc>

• There are other administrative options available for managing the ESXi-ARM server which we will not discuss here. For more information, refer to the VMware ESXi Guide.



Launching ESXi-ARM Server UI

Launch any browser and connect to the https://<IP address> of your ESXi-ARM server. Upon landing on to the login page, enter your ESXi-ARM server credentials to login.

$\leftarrow \ \ \rightarrow \ \ {\rm G}$	▲ Not secure https://10.76	.235.219/ui/#/login
vm	ware	
User name	root	VMWare [®] ESXi [™] on Arm Fling
Password		
	Log in	

Congratulations! You now can create VMs (Virtual Machines) and configure your ESXi-ARM host via the UI.

VmWare' ESXi [®] on Amp Filing				-	
T Navigator	snow218.scc-lab.amperecomputing.	.com			
Host Manage Monitor ● ② Virtual Machines 5 ● ③ Storage 1 ● ② Networking 1	Ceate vCenter Server 1 1 Create Snow218.scc-lab Version: State: Uptime:	arRegister VM Postud own Poston CRefresh Actions .amperecomputing.com ESX: on Am Fling (Build 2013314) Normal (Indi connected to any vCenter Server) 0.49 days		CPU FREE 240 CH2 0% USED: 20 MH2 CCARACTY 28 CH4 MEMORY FREE 123 120 USED: 245 GB CCAPACTY: 127 37 GB STORAGE FREE: 132 TH USED: 305 8 GB CCAPACTY: 12 715	
	* Hardware		* Configuration		
	Manufacturer	GIGABYTE	Image profile	ESXi-7.0.0-20133114-standard (VMware, Inc.)	
	Model	R272-P30-00	vSphere HA state		
	CPU	80 CPUs x ARM Limited Neoverse N1 r3p1	▶ vMotion	Supported	
	Memory	127.57 GB			
	🕨 🎆 SGX	0 B / 0 B	Date/time on host	Thursday, September 08, 2022, 23:46:12 UTC	
	Virtual flash	3.93 GB used, 119.75 GB capacity	Install date	Friday, August 19, 2022, 01:54:50 UTC	
	✓ Q Networking		Asset tag	01234567890123456789AB	
	Hostname	snow218.scc-lab.amperecomputing.com	Serial number	201203232	
	IP addresses	1. vmk0: 10.76.235.219 2. vmk0: fe80::2a0:c9ff;fe00:0	BIOS version	F31b (SCP: 2.10.20220531)	
	DNS servers	1. 10.76 100.2 2. 10.76 99.2	Performance summary last hour	Wednesday, June 15, 2022, 17:00:00 -07:00	
	Default gateway	10.76.235.1		Consumed host CPU	
	IPv6 enabled	Yes	100	Consumed host memory	
	Host adapters	2	100	120	
	Networks	Name VMs VMs Image: WM Network 5	08 %	100 g 3 80 g 7	
			P P	60 <u>\$</u>	_
	🕄 Recent tasks				
	Task	Target ~ Initiator ~ Queued	✓ Started	✓ Result ▲ ✓ Completed ▼	~

You can now add your ESXi-ARM server to your VMware Virtual Center Server.



Supported vCenter Servers

vCenter Server currently cannot be hosted on ARM based servers. Customers who wish to manage their ESXi-ARM server can use vCenter Server running on a x86 Server to manage their ESXi-ARM host. Refer to the VMware ARM Flings website for supported vCenter Servers versions.

VMware Supported ESXi-ARM Hardware

- Systems available from multiple retailers (official Ampere distributors' link)
- Avantek Ampere Altra Mt. Snow 2U Server (online store link)
- Avantek Ampere Altra Workstation (online store link)
- Ampere Computing eMAG-based systems from Avantek and Lenovo (HR330A, HR350A)
- Arm Neoverse N1 System Development Platform
- Ampere Computing Altra-based shapes from Oracle Cloud Infrastructure (experimental)
- **Note:** Links to the supported hardware mentioned above are from the VMware Flings Supported Hardware page at the time of this writing. Visit the VMware Flings Supported Hardware page for the latest update.



Document Revision History

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Ampere Computing 4655 Great America Parkway, Santa Clara, CA 95054 Phone: (669) 770-3700 https://www.amperecomputing.com

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