

WORK
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GARR
2024

NET
MAKERS

Raffronto di diversi sistemi di virtualizzazione

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Raffronto dei sistemi di virtualizzazione: perché farlo ora



Sovranità dati



Costi storage cloud



Licenze Broadcom

Confronto dei sistemi di virtualizzazione



Facilità di gestione



Bilanciamento del carico

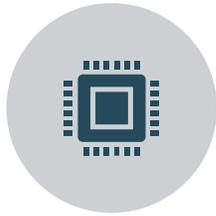


Supporto



Performance

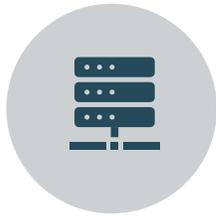
Dimensionamento



100-200 VM



Possibilità Container



5 server



Storage esterna
iSCSI



Cluster in parallelo

La scelta



VMware
vSphere®



Datacenter Virtualization
Solution (DCS)

VMware vSphere Enterprise Plus	Proxmox VE	Huawei DCS
Virtualizzatore proprietario Commerciale	KVM, basato su Debian OpenSource	KVM, basato su EulerOS (RHEL) Commerciale
Leader di mercato	community molto attiva	10 anni di sviluppo e utilizzo
Hypervisor light con vm di mng anche in HA	Hypervisor Fat con mng su ogni host in replica	Hypervisor light con vm di mng anche in HA
DRS, encryption, grid vGPU,	Clusterizzazione e alta disponibilità (50 nodi)	DRS, Multitenant, Distaster recover
vSphere Distributed Switch	Open vswitch	Open vswitch
molte terze parti come backup	backup compreso o veem backup	backup compreso, Commvault ed altri
	tool migrazione da VMware	tool migrazione da VMware
Upgrade centralizzati		Upgrade centralizzati (stesso tool per storage e server)

VMware vSphere



VMware
vSphere®

The screenshot displays the VMware vSphere Client interface for a Cluster-VS. The top navigation bar includes the vSphere Client logo, a search bar, and the user Administrator@VSPHERE.LOCAL. The left sidebar shows a tree view with vcenter-vs.polito.it > VS > Cluster-VS selected. The main content area is divided into several panels:

- Cluster Details:** Shows a bar chart icon and the following metrics:
 - Total Processors: 360
 - Total vMotion Migrations: 5
- Capacity and Usage:** Last updated at 10:58 PM. It displays three metrics with progress bars:
 - CPU:** 209.29 GHz used, 897.84 GHz allocated.
 - Memory:** 541.95 GB used, 5,118.28 GB allocated.
 - Storage:** 831.65 GB used, 11,553.75 GB allocated.
- vSphere DRS:** Shows a circular progress indicator for the Cluster DRS Score at 42%. To the right, a table shows VM DRS Scores:

VM DRS Score	Count
0-20%	0 VMs
20-40%	0 VMs
40-60%	1 VM
60-80%	0 VMs
80-100%	1 VM
- Related Objects:** Lists the Datacenter VS.
- Cluster Services:** Shows Cluster Service health as Healthy.

At the bottom, there are tabs for Recent Tasks and Alarms.

VMware vSphere



VMware
vSphere®

The screenshot displays the VMware vSphere Client interface for a virtual machine named 'Test-Win'. The interface is organized into several panels:

- Left Panel:** A navigation tree showing the hierarchy: vcenter-vs.polito.it > VS > Cluster-VS > Test-Win.
- Summary Panel:** Contains tabs for Summary, Monitor, Configure, Permissions, Datastores, Networks, Snapshots, and Updates. The 'Summary' tab is active.
- Guest OS Panel:** Shows a preview of the Windows desktop and two buttons: 'LAUNCH REMOTE CONSOLE' and 'LAUNCH WEB CONSOLE'.
- Virtual Machine Details Panel:** Lists key information:
 - Power Status:** Powered On
 - Guest OS:** Microsoft Windows Server 2022 (64-bit)
 - VMware Tools:** Running, version:12421 (Current)
 - DNS Name (1):** WIN-UFL0E6TTRUF
 - IP Addresses (2):** 192.168.229.101, fe80::50a9:69c0:c148:c3e1
 - Encryption:** Not encrypted
- Usage Panel:** Shows resource consumption:
 - CPU:** 232.889 GHz used
 - Memory:** 465.92 GB used
 - Storage:** 712.33 GB used
- VM Hardware Panel:** Lists hardware specifications:
 - CPU:** 128 CPU(s), 320304 MHz used
 - Memory:** 512 GB, 466 GB memory active
 - Hard disk 1:** 200 GB | Thick Provision Lazy Zeroed | CLUSTER_STORAGE
 - Network adapter 1:** DPortGroup-VM (connected) | 00:50:56:b3:d5:6e
- PCI Devices Panel:** Shows 'No PCI devices'.
- Related Objects Panel:** Lists associated objects:
 - Cluster:** Cluster-VS
 - Host:** vs35.polito.it
 - Networks:** DPortGroup-VM
 - Storage:** CLUSTER_STORAGE



VMware vSphere



VMware
vSphere®

The screenshot displays the VMware vSphere Client interface. The top navigation bar shows the user is logged in as Administrator@VSPHERE.LOCAL. The left sidebar shows a tree view of the environment, including vcenter-vs.polito.it, VS, Cluster-VS, and several virtual machines (vs31.polito.it to vs35.polito.it). The main area is focused on the 'Test-Win' virtual machine, showing the 'Virtual Machine Details' tab. The console view displays a Windows login screen with a background image of a rocky coastline. The login screen features a user icon, the text 'Administrator', and a password input field with a submit arrow.

PROXMOX Virtual Environment 8.2.7 Search Documentation Create VM Create CT root@pam

Folder View Node 'px36' Reboot Shutdown Shell Bulk Actions Help

Package versions Hour (average)

px36 (Uptime: 95 days 07:42:32)

CPU usage	4.88% of 144 CPU(s)	IO delay	0.00%
Load average	5.71,7.51,7.34		
RAM usage	52.07% (524.62 GiB of 1007.51 GiB)	KSM sharing	0 B
/ HD space	13.13% (12.34 GiB of 93.93 GiB)	SWAP usage	0.00% (0 B of 8.00 GiB)

CPU(s) 144 x Intel(R) Xeon(R) Gold 5318H CPU @ 2.50GHz (4 Sockets)
Kernel Version Linux 6.8.4-2-pve (2024-04-10T17:36Z)
Boot Mode EFI

Tasks Cluster log

Start Time ↓	End Time	Node	User name	Description	Status
Nov 03 11:00:46	Nov 03 21:24:33	px36	root@pam	Shell	OK
Nov 03 10:57:45	Nov 03 11:00:26	px36	root@pam	Shell	OK
Nov 03 10:57:34	Nov 03 10:57:38	px36	root@pam	Shell	OK
Nov 03 10:57:23	Nov 03 10:57:34	px36	root@pam	Shell	OK
Nov 03 10:55:53	Nov 03 10:57:22	px36	root@pam	Shell	OK
Nov 03 10:53:24	Nov 03 10:55:53	px36	root@pam	Shell	OK

PROXMOX Virtual Environment 8.2.7 Search

Documentation Create VM Create CT root@pam

Folder View

- ▼ Datacenter (cluster-px)
 - ▼ Nodes
 - px36
 - px37
 - px38
 - px39
 - px40
 - ▼ Virtual Machine
 - 100 (Ubuntu-Test)
 - 101 (VM 101) **VM 101**
 - Pause
 - Hibernate
 - Shutdown
 - Stop
 - Reboot
 - Migrate
 - Clone
 - Convert to template
 - Console
 - 102 (Test-...)
 - SDN
 - Storage

Virtual Machine 101 (VM 101) on node 'px36' No Tags

Start Shutdown Migrate Console More Help

Hour (average)

CPU usage

Time	CPU usage (%)
2024-11-03 20:20:00	5.5
2024-11-03 20:25:00	5.5
2024-11-03 20:30:00	5.5
2024-11-03 20:35:00	5.5
2024-11-03 20:40:00	5.5
2024-11-03 20:45:00	5.5
2024-11-03 20:50:00	5.5
2024-11-03 20:55:00	5.5
2024-11-03 21:00:00	5.5
2024-11-03 21:05:00	5.5
2024-11-03 21:10:00	5.5
2024-11-03 21:15:00	5.5
2024-11-03 21:20:00	5.5
2024-11-03 21:25:00	5.5

Memory usage

Time	Total (Gi)	RAM usage (Gi)
2024-11-03 20:20:00	512	512
2024-11-03 20:25:00	512	512
2024-11-03 20:30:00	512	512
2024-11-03 20:35:00	512	512
2024-11-03 20:40:00	512	512
2024-11-03 20:45:00	512	512
2024-11-03 20:50:00	512	512
2024-11-03 20:55:00	512	512
2024-11-03 21:00:00	512	512
2024-11-03 21:05:00	512	512
2024-11-03 21:10:00	512	512
2024-11-03 21:15:00	512	512
2024-11-03 21:20:00	512	512
2024-11-03 21:25:00	512	512

Tasks Cluster log

Start Time ↓	End Time	Node	User name	Description	Status
Nov 03 21:27:14	Nov 03 21:27:18	px36	root@pam	VM/CT 101 - Console	OK

Virtual Environment 8.2.7 Search

Documentation Create VM Create CT root@pam

Folder View

- Datacenter (cluster-px)
 - Nodes
 - px36
 - px37
 - px38
 - px39
 - px40
 - Virtual Machine
 - 100 (Ubuntu-Test)
 - 101 (VM 101)
 - 102 (Test-Win2)
 - SDN
 - Storage

Virtual Machine 101 (VM 101) on node 'px36' No Tags

Start Shutdown Migrate Console More Help

Summary
Console
Hardware
Cloud-Init
Options
Task History
Monitor
Backup
Replication
Snapshots
Firewall
Permissions

19:30
domenica, 3 novembre

Press Ctrl+Alt+Delete to unlock

Tasks Cluster log

Start Time ↓	End Time	Node	User name	Description	Status
Nov 03 21:30:26		px36	root@pam	VM/CT 101 - Console	

Huawei DCS

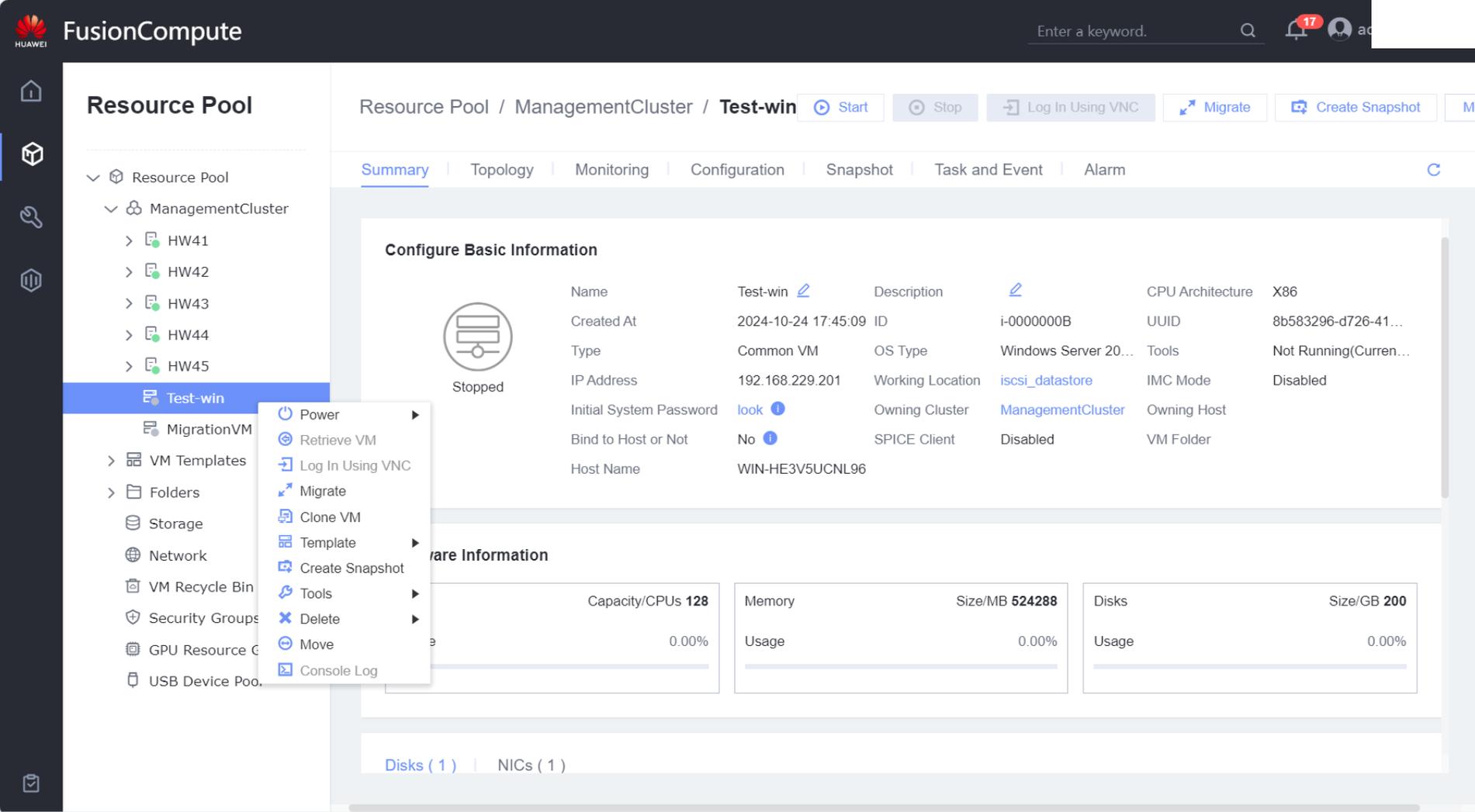


Datacenter Virtualization Solution (DCS)

The screenshot displays the FusionCompute management console. At the top, it shows the system status with 5 hosts and 11 VMs. Key resource metrics include 1755.36 GHz of available CPU, 4.868 TB of available memory, and 2.531 TB of available storage. Below these metrics, the 'Virtual Resource Pools' section provides a detailed breakdown of compute, storage, and network resources. At the bottom, there are quick links for common operations like creating VMs and importing templates.

Category	Item	Count
Compute	Clusters	1
	Hosts	5
	VMs	11
Storage	Datastores	3
	Disks	21
Network	DVSs	4
	Port Groups	2





The screenshot displays the FusionCompute interface for a VM named 'Test-win'. The left sidebar shows a navigation tree with 'Test-win' selected. A context menu is open over the VM, listing actions such as Power, Retrieve VM, Log In Using VNC, Migrate, Clone VM, Template, Create Snapshot, Tools, Delete, Move, and Console Log. The main content area shows the 'Configure Basic Information' tab, which includes a table of VM details and resource usage metrics.

Name	Test-win	Description		CPU Architecture	X86
Created At	2024-10-24 17:45:09	ID	i-0000000B	UUID	8b583296-d726-41...
Type	Common VM	OS Type	Windows Server 20...	Tools	Not Running(Curren...
IP Address	192.168.229.201	Working Location	iscsi_datastore	IMC Mode	Disabled
Initial System Password	look	Owning Cluster	ManagementCluster	Owning Host	
Bind to Host or Not	No	SPICE Client	Disabled	VM Folder	
Host Name	WIN-HE3V5UCNL96				

Capacity/CPU	128	Memory	Size/MB 524288	Disks	Size/GB 200
Usage	0.00%	Usage	0.00%	Usage	0.00%

Huawei DCS



Datacenter Virtualization
Solution (DCS)

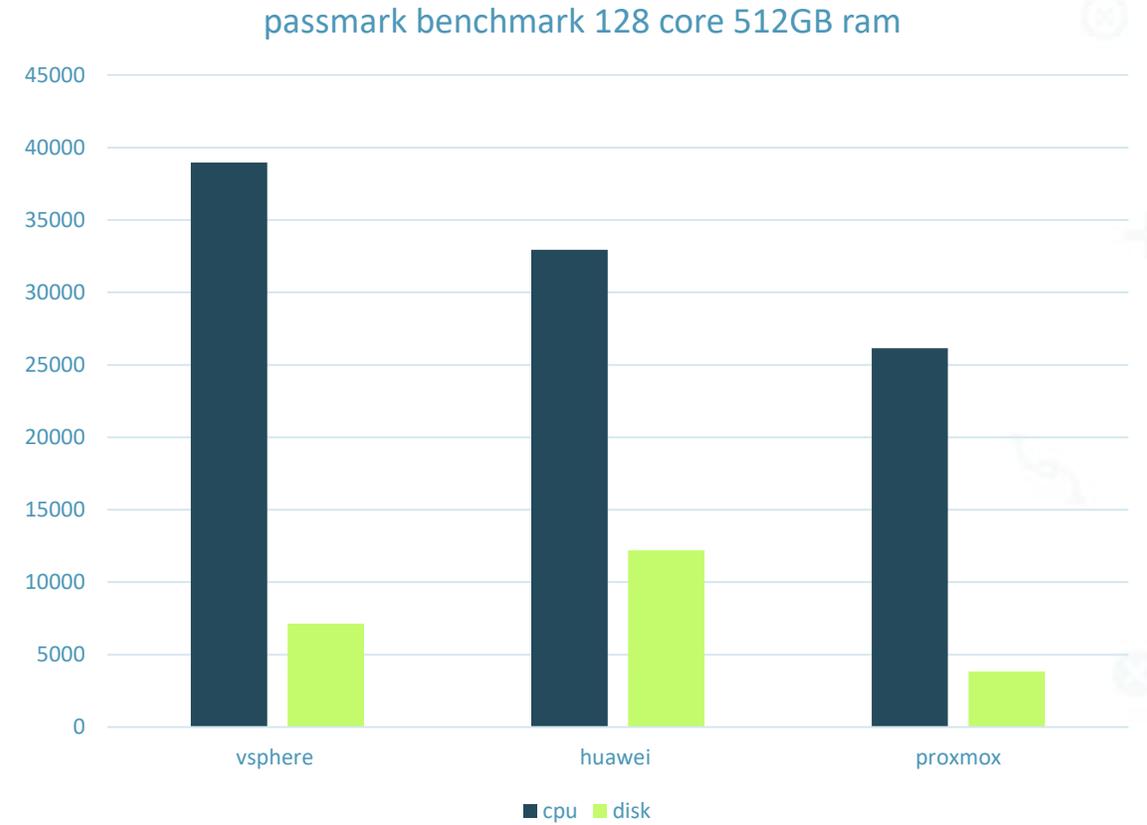
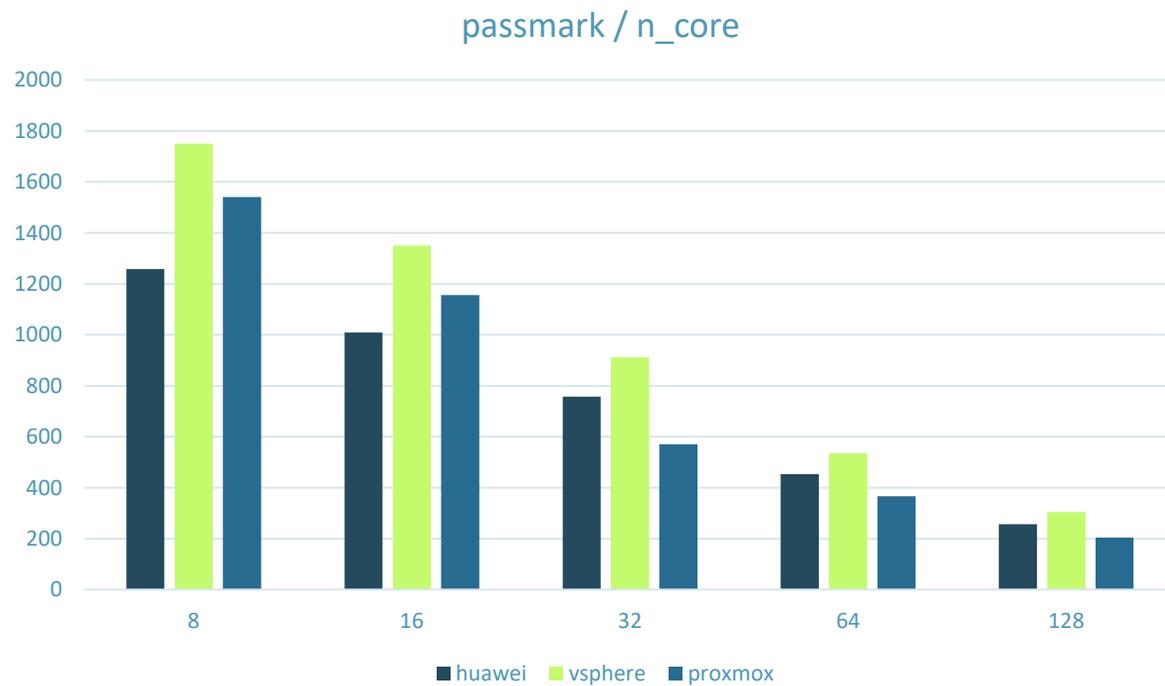
The screenshot displays the FusionCompute management interface. On the left, a navigation sidebar lists various resource pools and components, with 'Test-win' selected. The main area shows the 'Test-win' VM details, including its IP address (192.168.227.100) and a VNC connection URL. The VNC session itself shows a login screen for an 'Administrator' user, with a password input field and a 'Log In Using VNC' button. The background of the VNC session is a scenic image of a beach with a rock archway.



Performance

Tutte le vm sono state create con i valori di default

Storage iSCSI multipath host con 2 schede 10GB mtu 9000



Performance: vmotion impossible

Prendete una vm grande a piacere sul vostro sistema di virtualizzazione...

Ad esempio creando una vm con 128 core e 512 GB di ram.

Eseguite il benchmark prime95

Run a Torture Test

Number of cores to torture test: Use hyperthreading (more stressful)

Smallest FFTs (tests L1/L2 caches, high power/heat/CPU stress)

Small FFTs (tests L1/L2/L3 caches, maximum power/heat/CPU stress)

Medium FFTs (tests L1/L2/L3/L4 caches)

Large FFTs (stresses memory controller and RAM)

Blend (all of the above)

Custom

Torture test settings

Min FFT size (in K): Max FFT size (in K):

Run FFTs in-place Memory to use (in GiB):

Time to run each FFT size (in minutes):

Run a Weaker Torture Test (not recommended)

Disable AVX-512 Disable AVX2 (fused multiply-add)

Disable AVX

OK

Cancel

Performance: vmotion impossible



Solo VMware vSphere riesce a completare la vmotion.

In 14 minuti circa sposta una vm da 128 core e 512 GB ram da un host all'altro

Tutti gli altri contendere vanno in time out

SFIDA: provate sui vostri sistemi di virtualizzazione questo test e fatemi sapere se trovate qualche altro vincitore.

The screenshot displays a remote desktop session of a Windows 10 machine. In the foreground, the Windows Task Manager Performance tab is open, showing system metrics: CPU at 100% (2.49 GHz), Memory at 471/512 GB (92%), and Ethernet at 0 kbps. The vSphere Client interface is overlaid on top, showing the 'Test-Win' virtual machine details. The VM is powered on and running. The 'Usage' section shows 204.682 GHz of CPU used and 455.68 GB of memory used. At the bottom of the vSphere Client, a task log shows a 'Relocate virtual machine' operation for 'Test-Win' completed in 8 ms.



Prezzi (per socket per anno)

Proxmox:

Installabile gratuitamente con repository community, ma gli update potrebbero non essere testati sufficientemente e validati.

Costi utilizzo repository enterprise **110** euro, supporto a partire da **510** fino a **1000** euro con possibilità di intervento in ssh (in base al numero di incident annui).

Huawei DCS Suite:

Offrono servizi personalizzati sul cliente. Attualmente non c'è un listino prezzi.

Include Multitenancy, Migration tool, SmartKit, FusionCompute, eBackup, UltraVR (Disaster recovery) con un costo inferiore a **850** euro.

Stanno verificando la possibilità di creare un bundle per 3 server per far concorrenza con la versione essenziale di vSphere

vSphere Enterprise:

Costo commerciale di circa **4800** euro. Da verificare nuovi rinnovi CRUI

I cluster di test hanno 20 socket...

Conclusioni

licenze e/o supporto

funzionalità
personale e formazione
costo hw
migrazione del workload



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Grazie per l'ascolto

per le domande: wooclap.com
codice WSGARR24

