WitLinc Technology Wisdom Industrial Solution Consultant

工业私有云应用培训

王晓伟 13611182271 richard@witlinc.cn



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网络规划

软件环境&虚拟机的使用

工业私有云

04 注意事项

15 常见问题处理

工业私有云 01 硬件架构



计算节点 工业私有云内配置2-64台云计算节点 每节点配置1-2颗CPU&32-256GB内 存,150GB固态硬盘用于运行操作系 统

电源节点 WiCloud工业私有云配工业级

UPS与电池组,有效保证私有云 内设备在外部断电时依然能都持 续运行至管理员手动关机



网络节点

WiCloud工业私有云内含相互冗 余的工业级网管型核心交换机。配 置千兆电口与万兆光口,充分满足 私有云内网络访问需求,可配合现 场网络做环网节点、双网互备节点、 单网接入 , 私有云出厂默认划分

存储节点 工业级存储设备,双控双电源, 8-128TB硬盘支持,硬件RAID组, 全方位保障数据存储安全。

紧凑型机箱设计,让数据中心变为单个整体设备!

WitLinc



赵融合架构



Windows Hyper-V

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10

分区 一台物理机上运行多个操作系统

隔离 将硬件故障和安全风险隔离在软件之外

封装 移动和复制虚拟机与操作文件一样容易

独立于硬件 同一个虚拟机不需要更改设置就可运行不同硬件

工业私有云 02 软件环境&虚拟机的使用



WiCloud软件环境

WiCloud工业私有云软件环境分两层结构,底层虚拟化环境为Hyper-V平台,完成虚拟机运行所需资源的虚拟化Hyper-V平台可为用户提供完整的虚拟机管理策略,例如创建虚拟机、修改虚拟机配置、为虚拟机创建快照、导出导入虚拟机、虚拟机复制等

Failover Cluster Manager为私有云环境群集管理平台,它可将私有云内所有Hyper-V平台资源集中管理起来,并为用户的虚拟机提供HA高可用性功能,保障用户避免因为物理机故障导致的业务中断。同时该环境也提供虚拟机的所有管理策略。

需要注意的是,如果您的虚拟机已经在Failover Cluster Manager管理平台内,您只能通过该平台的虚拟机设置 功能为您的虚拟机进行配置





虚拟机管理Hyper-V

Hyper-V Manager快捷打开方式位于桌面底部任务栏,也可以通过Server Manager里面的Tool>Hyper-V Manager打开,Hyper-V为WiCloud底层虚拟化环境,所有硬盘、CPU、内存、网络等所有资源环境都是通过Hyper-V平台实现虚拟化,在Hyper-V管理器内可实现对虚拟机所有配置

anager	Virtual Machines						
B-A1 B-A2	Name	State	CPU Usage	Assigned Memory	Uptime	Status	Configurati
		Bupping	0%	1226 MB	1 18:49:24	otatas	80
		Bupping	0%	4096 MB	04-58-25		8.0
		Bunning	0%	2048 MB	06:26:51		8.0
	Menggang	Bunning	0%	2048 MB	05:50:49		80
	WIN2003X32	Bunning	0%	4096 MB	20:36:30		8.0
	XS	Running	0%	4096 MB	18:49:19		8.0
	YXdataServer	Off			2.75.0700.0		8.0
			TL	ne selected virtual machine	e has no checkpoin	ıts.	
	YXdataServer Create	ed:	10/24/2018 01:02:	51		Clustered: No	
	YXdataServer Create Config	ed: Turation Version:	10/24/2018 01:02: 8.0	51		Clustered: No	

WiCloud 工业私有云平台

虚拟机管理Hyper-V

Hyper-V Manager可同时连接一套WiCloud内所有节点的Hyper-V管理器,并且对其上的虚拟机进行配置,下例中连接到WL-820B-A1节点和WL-820B-A2节点

Aanager 0B-A1 Virtual Machines						
0B-A2 Name	State	CPU Usage	Assigned Memory	Uptime	Status	Configurati
AD	Running	0%	1226 MB	1.18:49:24		8.0
📒 DCSChengzhong	Running	0%	4096 MB	04:58:25		8.0
🗧 KAOQIN	Running	0%	2048 MB	06:26:51		8.0
📒 Menggang	Running	0%	2048 MB	05:50:49		8.0
E WIN2003×32	Running	0%	4096 MB	20:36:30		8.0
🗧 🔀	Running	0%	4096 MB	18:49:19		8.0
🚆 YXdataServer	Off					8.0
Checkpoints						
Checkpoints		Th	e selected virtual machine	has no checkpoin	\$.	
Checkpoints YXdataServer		Th	e selected virtual machine	has no checkpoin	\$.	
Checkpoints YXdataServer Creat		Th 	e selected virtual machine	has no checkpoin	s. Clustered: No	
Checkpoints YXdataServer Creat Config	ed: uration Version:	Th 10/24/2018 01:02: 8.0	e selected virtual machine	has no checkpoin	s. Clustered: No	



虚拟机管理Hyper-V

Hyper-V Manag	er Virtual Machine	*			Actions	
WL-820B-/(1	New	Virtual Machine	Isage Assigned Memory	Unt	WL-820B-A1	-
	Import Virtual Machine	Hard Disk	2048 MR	21.0	New	•
	Huner-V Settings	Floppy Disk	1640 MB	19:4	🕼 Import Virtual Machine	
	Virtual Switch Manager				Hyper-V Settings	
	Virtual SAN Manager				🚰 Virtual Switch Manager	
	5.00 D. 1				🔒 Virtual SAN Manager	
	Edit Disk				Edit Disk	
	inspect Disk				Inspect Disk	
	Stop Service				Stop Service	
	Remove Server	No virtual m	achine selected		X Remove Server	
	Refresh				B) Refresh	
	View	>			View	
	11.1.				view	

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虚拟机管理Hyper-V

Hyper-V Manager创建虚拟机



This wizard helps you create a virtual machine. You can use virtual machines in place of physical computers for a variety of uses. You can use this wizard to configure the virtual machine now, and you can change the configuration later using Hyper-V Manager.

Finish

Cancel

Next >

X

To create a virtual machine, do one of the following:

- Click Finish to create a virtual machine that is configured with default values.
- Click Next to create a virtual machine with a custom configuration.

Do not show this page again

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虚拟机管理Hyper-V

1.2、配置新建虚拟机名字以及配置文件位置如下图:

🔜 New Virtual Machine Wizard

Specify Name and Location

Before You Begin Specify Name and Location Specify Generation Assign Memory Configure Networking

Connect Virtual Hard Disk

Installation Options

Summary

Choose a name and location for this virtual machine.

The name is displayed in Hyper-V Manager. We recommend that you use a name that helps you easily identify this virtual machine, such as the name of the guest operating system or workload.

Name: New Virtual Machine

You can create a folder or use an existing folder to store the virtual machine. If you don't select a folder, the virtual machine is stored in the default folder configured for this server.

Store the virtual machine in a different location

Location: C:\ProgramData\Microsoft\Windows\Hyper-V\

Browse...

X

▲ If you plan to take checkpoints of this virtual machine, select a location that has enough free space. Checkpoints include virtual machine data and may require a large amount of space.

备注:如果需要将新创建的该虚拟机配置为具有高可用性的虚拟机,必须将该虚 拟机存储位置处置选择至"C:\ClusterStorage\Volume1\"文件目录下



虚拟机管理Hyper-V

New Virtual Machine Wiza	ard	×
💴 Assign Mem	ory	
efore You Begin pecify Name and Location pecify Generation ssign Memory onfigure Networking onnect Virtual Hard Disk Installation Options ummary	Specify the amount of memory to allocate to this virtual machine. You can specify an amount from 32 MB through 12582912 MB. To improve performance, specify more than the minimum amount recommended for the operating system. Startup memory: Startup memory: MB Use Dynamic Memory for this virtual machine. When you decide how much memory to assign to a virtual machine, consider how you intend to use the virtual machine and the operating system that it will run.	
	< Previous Next > Finish Cancel	-

配置新建虚拟机的内存,根据需求选择 是否需要选择新建虚拟机按需分配内存

◆ Startup memory: 虚拟机其实运行的内存,只在虚拟机启动时以该配置大小运行,启动完成后根据虚拟机自身应用使用内存,正常运行后,虚拟机使用内存一般比该出设置的数量小

◆ Use Dynamic memory…: 微软动态 调节内存技术,对win7SP1以后的操 作系统,该选项可提供多于起始内 存的资源消耗,因此,对于此类操 作系统的虚拟机,可为startmemory 设置一个较小的值,并勾选此项, 当虚拟机使用内存不足时,会自动 从内存资源池划分



虚拟机管理Hyper-V



该处选择的虚拟网卡可提前在 Hyper-V Manager 中创建完毕,也可以先创建虚拟 机之后再添加虚拟网卡。如果需要配置虚 拟机的高可用性,所有 Hyper-V 节点上的虚拟网卡名称必须保持一致

WiCloud _{工业私有云平台} 虚拟机管理Hyper-V 配置新建虚拟机的虚拟磁盘位置以及虚拟磁盘容量大小

Connect Vir	tual Hard Disk
efore You Begin becify Name and Location becify Generation ssign Memory bonfigure Networking	A virtual machine requires storage so that you can install an operating system. You can specify the storage now or configure it later by modifying the virtual machine's properties.
onnect Virtual Hard Disk Installation Options Immary	Location: C:\Users\Public\Documents\Hyper-V\Virtual Hard Disks\ Browse Size: 127 GB (Maximum: 64 TB) O Use an existing virtual hard disk Use this option to attach an existing virtual hard disk, either VHD or VHDX format.
	Location: C:\Users\Public\Documents\Hyper-V\Virtual Hard Disks\ Browse O Attach a virtual hard disk later Use this option to skip this step now and attach an existing virtual hard disk later.

< Previous

Next >

Finish

Cance

如果需要将新创建的该虚拟机配置为具有高可用 性的虚拟机,必须将该虚拟磁盘位置选择至 "C:\ClusterStorage\Volume1\"文件目录下

Create a virtual hard disk: 新建虚拟硬盘, 默认127GB, 该容量可在虚拟机内查看到

Use an exit virtual hard disk: 使用已 有的虚拟磁盘,用户可使用该选项挂载之前 已经创建的虚拟机磁盘,如果该虚拟磁盘含 操作系统启动文件,挂在后可直接运行 Attach a virtualhard disk later: 稍后 配置虚拟磁盘



虚拟机管理Hyper-V

efore You Begin becify Name and Location	You can install an operating system now if you have access to the setup media, or you can install later.	it
ecify Generation	Install an operating system later	
sign Memory	○ Install an operating system from a bootable <u>C</u> D/DVD-ROM	
onfigure Networking	Media	
onnect Virtual Hard Disk	Physical CD/DVD drive:	
Installation Options	Image file (.iso):	4.)
mmary		
	 Install an operating system from a bootable floppy disk 	
	Media	
	Virtual floppy disk (.vfd):	÷
	Install an operating system from a network-based installation server	

◆ 稍后安装操作系统
◆ 从CD/DVD-ROM启动项安装操作系统
◆ 选择从物理CD/DVD设备安装或使用 .1S0文件安装
◆ 从软驱安装
◆ 从网络安装
实际使用时,建议从MSDN官网下载纯净 版的iso文件安装操作系统



虚拟机管理Hyper-V

🖳 New Virtual Machine Wizard

Completing the New Virtual Machine Wizard

<

Before You Begin Specify Name and Location Specify Generation Assign Memory Configure Networking Connect Virtual Hard Disk Installation Options

Summary

following virtual machine. Description: Name: New Virtual Machine Generation: Generation 1 Memory: 1024 MB Network: vSwitch Hard Disk: C:\Users\Public\Documents\Hyper-V\Virtual Hard Disks\New Virtual Machine.vhdx Operating System: Will be installed at a later time

You have successfully completed the New Virtual Machine Wizard. You are about to create the

To create the virtual machine and close the wizard, click Finish.

× 至此, Hyper-V内创建虚拟机完毕, 点击Finish后在Hyper-V管理器内启 动虚拟机即可

< Previous

Einish

>

Cancel

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虚拟机管理Hyper-V虚拟交换机

Hyper-V 管理器右键即可选择配置虚拟机交换机

📲 🛚 Hyper-V Manager								
File Action View	Help							
🗢 🏟 🙍 📰 🛛								
Hyper-V Manager		Virtual Machines	_					
₩L-820B-4	New Import Virtus Hyper-V Sett Virtual Switc Virtual SAN N Edit Disk Inspect Disk.) al Machine tings h Manager Manager	State Running Running Running Running Running Off	CPU Usage 0% 0% 0% 0% 0%	Assigned Memory 1226 MB 4096 MB 2048 MB 2048 MB 4096 MB 4096 MB	Uptime 1.18:52:37 05:01:38 06:30:04 05:54:02 20:39:43 18:52:32	Status	Configurati 8.0 8.0 8.0 8.0 8.0 8.0 8.0 8.0
	Stop Service Remove Serv Refresh View	ver		Th	e selected virtual machine	e has no checkpoir	ıts.	
	Help							
		¥XdataServer						
			Created: Configuration ¥ersion: Generation: Notes:	10/24/2018 01:02: 8.0 1 None	51		Clustered: No	



Hyper-V 提供了3种虚拟交换机模式来满足用户不同的需求

per-V Manager Action View Help Action View Help Action View Help WI-820B-A1 WI-820B-A1 WI-820B-A2	Virtual Switch Manager for WL-820B-A1 Virtual Switches New virtual network switch VSwitch-Storage Microsoft Network Adapter Multipl VSwitch1	Name: vSwitch1	×
Name AD AD DCSChengzhong KAOQIN Menggang VIN2003X32 XS VIN2003X32 XS VXdataServer VXdataServer VXdataServer VXdataServer Checkpoints Checkpoints Creat Cont Gen Note	Intel(R) 82574L Gigabit Network C	Notes: Connection type What do you want to connect this virtual switch to?	

External Network: 外部 网络 Internal network: 内部 网络 Private network: 专用网 络

VLAN ID: 用于配合网管型 交换机使用的





External Network: 虚拟交换机部 署完成后, 虚拟机和宿主机连接到 同一个虚拟交换机。虚拟机与宿主 机获取同一网段的IP地址, 与宿主 机所在的网络中的其他计算机通信 , 每台虚拟机等同于宿主机所在网 络的宿主机。





Physical Network

Internal Network: 内部网络相当 于给宿主机虚拟一张网卡,用于与 虚拟机通信,并且提供DHCP服务和 NAT代理服务。虚拟机可以通过宿 主机上网但是不能与宿主机所在的 网络通信





Private Network: 专用网络相当 与虚拟一个专供虚拟机之间连接的 虚拟交换机,所有的虚拟机连接到 同一个虚拟交换机上,所有的虚拟 机之间可以通信,但是不能访问宿 主机以及宿主机所在的网络



Failover Cluster Manager快捷打开方式位于桌面底部任务栏,也可以通过Server Manager里面的Tool> Failover Cluster Manager打开, Failover Cluster Manager为WiCloud上层虚拟机管理环境,基于Hyper-V 平台,为用户提供多物理节点整合方案,将多个物理节点的资源集中管理,并为其上运行的虚拟机、存储提 供HA高可用机制,保障用户业务工作不间断。

Failover Cluster Manager								D 1	H. H.	
File Action View Help								Koles:	用巴,	此处指运行的虚拟。
🗢 🤿 🙍 🖬 🛛 🖬								μП		
📲 Failover Cluster Manager	Roles (8)							17 L		
VitLinc-WL-820B-A.WITLINC.dom	Search						🔎 Queries 🔻 🔒 👻 😪			
Nodes	Name	Status	Туре	Owner Node	Priority	Information				
> 📇 Storage	AD	() Running	Virtual Machine	WL-820B-A1	High					
Networks	🛃 CangkuServer	Running	Virtual Machine	WL-820B-A2	Medium			20 12 10 10		
Cluster Events	achongzhuang	() Running	Virtual Machine	WL-820B-A2	Medium					
	DCSChengzhong	() Running	Virtual Machine	WL-820B-A1	Medium			a start a second		
	KAOQIN	() Running	Virtual Machine	WL-820B-A1	Medium					
1	Menggang	() Running	Virtual Machine	WL-820B-A1	Medium					
	J. XS	Running	Virtual Machine	WL-820B-A1	High					
	3. XSServer	Running	Virtual Machine	WL-820B-A2	Medium			1. S.		
		() is a marked by the second s								
-										
2	<							Share and the second		
	👻 🌔 AD						Preferred Owners: Any node		- Aller	
	Virtual Machine AD						^			
		Status:	Running							
		CPU Usage:	0%		Up Time:		1:18:46:25	1 Mar		
		Memory Demand:	1017 MB		Assigned I	Memory:	1226 MB	N SMB V		
		Integration Services:	10.0.14393		Heartbeat		ОК	M. C.		
	Bart Martin		1. A.M.	1. 1. 1. 1. 1. 1.	2 IN ANA	y 11.19 %	THE FREE PRINT	Carlo - Alle		



🖫 Failover Cluster Manager File Action View Help 2 7 🍓 Failover Cluster Manager Nodes (2) ✓ 1 WitLinc-WL-820B-A.WITLINC.dom 🔎 Queries 🔻 🔚 🔻 😪 Search 🔚 Roles Nodes Status Assigned Vote Name Current Vote Site Rack Chassis > 📙 Storage 2 WL-820B-A1 🕥 Up 0 🛅 Networks NL-820B-A2 (Up 1 Iluster Events

Node: 节点, 指当前在该工业私有 云群集内的计算节点及其运行状态



📲 Failover Cluster Manager									
<u>File Action View H</u> elp									
🗢 🄿 📶 🖬 🚺									
📲 Failover Cluster Manager	Disks (2)								
 WitLinc-WL-820B-A.WITLINC.dom Roles 	Search	_				P	Queries 🔻		•
Nodes	Name	Status	Assigned To	Owner Node	Disk Number	Partition Style	Capacity		Rep
🗸 📇 Storage	📇 Cluster Disk 1	Online	Available Storage	WL-820B-A2	1	GPT		20.0 GB	
E Disks	📇 Cluster Disk 2	() Online	Cluster Shared Volume	WL-820B-A1	2	GPT		3.00 TB	
Enclosures									
韇 Networks									
👪 Cluster Events									
	<								>
	👻 🦣 Cluster Disk 1								
	Volumes (1)								
	New Volume (D)								
	NTFS 19.8 GB free	e of 19.9 GB							

Storage:存储,指当前在该工业 私有云群集内的存储节点及其运行 状态,该存储一般分2个群集磁盘 ,一个作为HA机制发生时的仲裁磁 盘,另一个为群集共享卷,及该群 集内所有设备都可以访问的卷,位 于C:\ClusterStorage\Volume1\



📲 Failover Cluster Manager	Networks (3)						Network: 网络,指当前在该上业
 WitLinc-WL-820B-A.WITLINC.dom Roles 	Search				P Quer	ries 🔻 🔛 🔻 🛇	私有云群集内可用的网络资源
Nodes Storage Disks Pools Enclosures Networks Cluster Events	Name Cluster Network 1 Cluster Network 2	Status Status Up Up Up Up	Cluster Use Cluster and Client Cluster and Client Cluster and Client	Information			
	Cluster Netwo Subnets: 192.168.	ork 3 100.0/24					



Configure Role Virtual Machines Create Empty Role View	> [Status New Virtual Machine New Hard Disk	De Queries	✓	Roles	Role
Configure Role Virtual Machines Create Empty Role View	>	Status New Virtual Machine New Hard Disk	Type Machine	Owner Node WL-820B-A1	Configure	Role
Virtual Machines Create Empty Role View	>	New Virtual Machine New Hard Disk	Machine	WL-820B-A1	Mintural Ma-	
Create Empty Role View		New Hard Disk			Virtual IVia	chin I
View					📷 Create Err	ipty
	2				View	
D ()					🚺 Refresh	
Refresh					<table-cell> Help</table-cell>	
Help						
	Help	Help	Help	Help	Help	Help

鼠标选中Roles右键 >Virtual Machine>New Virtual Machine



Search		Clear
uster nodes:		
Name	Status	
WL-820B-A1	🕑 Up	

选择希望新建的虚拟机运行在那个宿主机节点上, 选中后点OK即可 其后创建过程与在Hyper-V内创建虚拟机过程相同



X 🗱 High Availability Wizard Summary Configure High High availability was successfully configured for the role. Availability Summary Result Warning test Results by Category Virtual Machine Warning Warnings * Disk path 'C:\cn_windows_7_ultimate_with_sp1_x64_dvd_u_677408.iso' is not a path to storage in the cluster or to storage that can be added to the cluster. You must ensure this storage is available to every node in the cluster to make this virtual machine highly available. *You can change the location of the virtual machine and its files to a valid cluster-managed storage location, or use the Move Virtual Machine To view the report created by the wizard, click View Report. View Report... To close this wizard, click Finish.

创建完成后会出现已经为 该虚拟机配置HA功能的提 示页面

Finish



	Roles (2)				Actions
WitLincCluster.witlinc.	Search		P Queries	• • •	Roles
Nodes	Name	Status	Туре	Owner Node	🧑 Configure R
> 📇 Storage	AD-DC	() Running	Virtual Machine	WL-820B-A1	Virtual Mac 🕨
Networks	a test	€ Off	Virtual Machine	WL-820B-A1	Create Emp
E Cluster Events					View
					Refresh
					Help
					test
					onnect
					Start
					🔘 Save
					Shut Down
					Turn Off
					Settings
					Manage
					Replication

创建完成后会在Roles列表 内看到刚才创建的虚拟机



如何将Hyper-V内已经存在的虚拟机添加到Failover Cluster Manager?

前提条件: 1、Failover Cluster Manager已经正确部署 2、虚拟机配置文件和虚拟硬盘存储位置在C:\ClusterStorage\Volume1\ 路劲下



在Failover Cluster Manager内选择Roles, 右键, 单击Configure Roles

Failover Clu	ster Manager Roles (1)				Actions
WitLinco	Cluster.witlinc. Search		P Queries	▼ 🖬 ▼ 😔	Roles -
M III	Configure Role	Status	Туре	Owner Node	k Configure Role
> 📇 S	Virtual Machines >	(Running	Virtual Machine	WL-820B-A1	Virtual Machin
	Create Empty Role				🔚 Create Empty
	View >				View
	Pafrach				G Refresh
	Kerresn				[Help
	Help				



🧱 High Availability Wizard



Before You Begin



Select Role

This wizard configures high availability for a role. After you successfully complete this wizard, if a clustered server fails while running the role, another clustered server automatically begins running the role (a process known as failover). If the role itself fails, it can be automatically restarted, either on the same server or on another server in the cluster, depending on options that you specify.

If you want to cluster a complex application such as a mail server or database application, see that application's documentation for information about the correct way to install it.

Do not show this page again

Next >

Cancel

X

默认, 点Next



X

🗱 High Availability Wizard



Select Role

Select Role

Before You Begin

Select the role that you want to configure for high availability:

Select Virtual Machine

Confirmation Configure High Availability

Summary

Generic Service Hyper-V Replica Broker SCSI Target Server SNS Server Message Queuing Other Server Virtual Machine WINS Server

Description:

~

A virtual machine is a virtualized computer system running on a physical computer. Multiple virtual machines can run on one computer.

< Previous

Cancel

Next >

此页面中选中 Virtual Machine选 项,点击next



elect Role	Select the virtual machine(s)	rnat you want to conligure ro	n nign avaliddillity.	
elect Virtual Machine onfirmation onfigure High vailability ummary	Name WIN7-2 WIN7 test	Status Running Running Off	Host Server WL-820B-A2.witlinc.domain WL-820B-A1.witlinc.domain WL-820B-A1.witlinc.domain	
	Shutdown Save		Refres	h
			< <u>Previous</u> <u>N</u> ext > Cancel	

ore You Begin		
ect Role	You are ready to configure high availability for a virtual Machine.	
ect Virtual Machine	Virtual Machine	^
firmation	WIN7-2	
figure High ilability	WIN7	
nmary		
		~

< Previous

Next >

Cancel



High Availability Wizard Configure High Availability	×				
Before You Begin Select Role Select Virtual Machine Confirmation		igh Availability W	Vizard		×
Summary Creating virtual machine role 'W/IN7-2'		Before You Begin Select Role Select Virtual Machine Confirmation Configure High Availability	High availability was successfully configured for the role. Result WIN7 WIN7-2 Results by Category	Warning Success	^
Cancel		Summary	Virtual Machine Warnings * Disk path 'C:\cn, windows_7_ultimate_with_sp1_x64_dvd_u_677408.iso' is not a path to storage in the cluster or to storage that can be added to the cluster. You must ensure this storage is available to every node in the cluster to make this virtual machine highly available. * You can change the location of the virtual machine and its files to a Taking the reset exected by the virtual machine and its files to a	Warning	~
			To close this wizard, click Finish.		view Heport



添加成功,可在列表中查看到刚才添加的虚拟机

 Failover Cluster Manager WitLincCluster.witlinc. 	Roles (3) Search		P Queries	▼⋳▼♡	Actions Roles	•
Roles Nodes Storage Networks Cluster Events	Name AD-DC WIN7 WIN7-2	Status Running Running Running	Type Virtual Machine Virtual Machine Virtual Machine	Owner Node WL-820B-A1 WL-820B-A1 WL-820B-A2	 Configure Role Virtual Machin Create Empty View Refresh Help 	•



虚拟机的计划内/计划外迁移

计划内迁移:

用户需要维护物理机时,又不希望影响到虚拟机的运行,此时虚拟机迁移由用户主动、有 计划的发起,此时有2种方法实现计划内迁移而不影响虚拟机的正常运行 1、Hyper-V的Move(实时迁移),可实时迁移虚拟机配置文件和虚拟磁盘的存储位置 2、Failover Cluster Manager内的Live Migration(实时迁移),虚拟机存储位置必须位于 C:\ClusterStorage\Volume1\路劲下 此外,Failover Cluster Manager还提供了计划内的QuickMigration(快速迁移),这种 迁移速度快,但是迁移完成后虚拟机会有重新启动的过程

计划外迁移:

当物理机出现宕机、断网、系统奔覆等现象时已经不足以维持当前节点上运行虚拟机,此时,虚拟机会自发地从当前节点迁移到其他可用的节点,这个过程是自动进行的,此时,由群集仲裁磁盘与其他节点共同投票选择虚拟机应该迁移到那台物理几点上继续运行。这种机制可大大降低用户设备发生故障时对业务的影响程度



虚拟机的计划内/计划外迁移

无需停机实现更快、 无缝的虚拟机迁移

- 更快的实时迁移,充分利 用现有网络
- 并发进行实时迁移
- 可以支持计算和存储节点
- 可以通过PowerShell触发

移动处理方式





1、Failover Cluster Manager内计划迁移

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a, Live Migration

ailover Cluste	Roles (3)								Actions	-
WitLincClu	Search					🔎 Queries 🔻		•	Roles	*
Nodes	Name		Status	Туре		Owner Node	Priority	,	🧑 Configure R	-
Storage Netwoi	AD-DC		RunningRunning	Virtual Ma Virtual Ma	chine chine	WL-820B-A1 WL-820B-A1	Mediu Mediu	im im	Virtual Mac Time Create Emp	•
	₩IN7-2		Connect Start Save Shut Down Turn Off Settings Manage Replication		thine	WL-820B-A2	Mediu	m	View Refresh Help WIN7-2 Connect Start Save Save Shut Down	•
			Move Cancel Live Migration	•))))	Live Migration Quick Migration	•		Best Possible Node Select Node	
			Change Startup Priority	•	8	Virtual Machine Storage	-		Manage	
			Information Details Show Critical Events					-	Peplication Replication	•
	<	3	Add Storage Add Resource					>	Cancel Live 😵 Change Sta	,



迁移进度

1、Failover Cluster Manager内计划迁移 a、Live Migration





1、Failover Cluster Manager内计划迁移 a、Live Migration





1、Failover Cluster Manager内计划迁移 b、Quick Migration

Hailover Cluster Manager	Roles (8)									Action
VitLinc-WL-820B-A.WITLIN	Search							🔎 Queries 🔻 🗖 🔻	$ \mathbf{\bullet} $	Roles
Nodes	Name	Status		Туре	Owner Nod	e	Priority Information			🎭 c
> 📇 Storage	AD	() Running		Virtual Machine	WL-820B-A	.1	High			v
Networks	CangkuServer			Virtual Machine	WL-820B-A	2	High			📷 c
	🛃 chongzhuang	() Running		Virtual Machine	WL-820B-A	2	Medium			v
	E DCSChengzhong			Virtual Machine	WI -820B-A	1	Medium		- 11	Q R
	🛃 KAOQIN	() Running		Connect		2	Medium		- 11	2 F
	E. Menggang	() Running	0	Start		1	Medium			
	🛃 XSData	() Running	0	Save		1	High			Meng
	SNet XSNet	() Running	0	Shut Down		2	Medium		- 11	🤹 (
			•	Turn Off					- 11	🕑 S
				Settings					- 11	🕘 S
			ā,	Manage						🔘 S
	<		1	Replication	•				>	T
				Move	•	1	Live Migration	•	=1	S
	V Menggang			Cancel Live Migration			Quick Migration	Best Possible Node		N 🞼
			۲	Change Startup Priorit	y 🕨	2	Virtual Machine Storage	Select Node		🔋 R
	Virtual Machine Mengg	ang		Information Details						📝 N
	THE SECOND	Status:		Show Critical Events				1 10 10 11		👬 c
		CPU Usage: Memory Deman	4	Add Storage			Up Time: Assigned Memory:	1:12:13:11 2048 MB		🔞 C
	.	Integration Serv		Add Resource			Heartbeat:	OK		
		Computer Name					Operating System:	Windows 7 Ultimate		
	A Uniting (easy	Date Created:		More Actions	•		Operating System Version:	6.1.7601		



1、Failover Cluster Manager内计划迁移 b、Quick Migration

• 🔿 🙋 📰 🚺						
Failover Cluster Manager	Roles (8)				-	Action
WitLinc-WL-820B-A.WITLIN	Search		Move Virtual Machine	×	🔎 Queries 🔻 🕁 👻	Roles
Nodes Nodes Storage Networks	Name AD CangkuServer chongzhuang CSChengzhong KAOQIN Menggang XSData XSNet	Status Running Running Running Running Running Running Running Running Running	Select the destination node for qu from 'WL-820B-A1'. Look for: Search Cluster nodes: Wanc 9 WL-820B-A2	uick migration of 'Menggang'	>	 ➡ C V ➡ C V ➡ C V ➡ R ➡ I ➡ Meng ➡ C ➡ S ➡ S ➡ S ➡ S ➡ S
	Menggang Virtual Machine Mengga	ang Status: CPU Usage: Memory Demand: Integration Service Computer Name: Date Created:	rs. 0.3.5000.10550 Mengang-HV 9/13/2018 07:09:08	OK Cancel nearweat. Operating System: Operating System Version:	Preferred Owners: Any node	■ S ■ N ■ R ■ R ■ C ■ C ■ C ■ C ■ C ■ S N ■ S



2、Hyper-V内计划迁移

在Hyper-V管理器内选择需要 迁移的虚拟机,右键选择 Move

虚拟机的计划内迁移

	Chinakin ito Lukin						
Hyper-V Manager							
File Action View Help							
🗢 🄿 🔁 🖬 🚺							
∺ Hyper-V Manager							Actions
WL-820B-A1		5		CDULU			WL-820B-A1
WL-820B-A2	Name	Si	tate	CPU Usage	Assigned Memory	Uptim	New
	DCSChengz	Connect	upning		4096 MB	1.00.14	Import Virtual Machine
	Menggang	Settings			2048 MB	1.12:14	Hyper-V Settings
	📒 XSData	7 0%			4096 MB	05:25:4	Virtual Switch Manager
	<	Furn Off			_		🔒 Virtual SAN Manager
	Chackpoints	Save					🥳 Edit Disk
							Inspect Disk
		Pause					Stop Service
	ė	Reset					X Remove Server
		Checkpoint	t				🖏 Refresh
		Kevert		-			View
		Move					Help
	AD	Export					AD
		Rename					Connect
		Enable Rep	lication	018 21:33:	06 Clustered:	Yes	Settings
	8:01	Help			Heartbeat:	OK (Applic Healthy)	Turn Off
	And a state of the	Generation:	1				Shut Down
		Notes:	Nor	ie			G Save
							Pause



随后选择Next

2、Hyper-V内计划迁移

🗢 🔿 🖄 📅 🚺 🖬 🖶 Move "CAILIAOKU" Wizard X Hyper-V Manager Virtual Machin WL-820B-A1 **Before You Begin** WL-820B-A2 Name igurati CAILIAOKU 🗧 CangkuSer This wizard helps you move a virtual machine to a different computer, or move virtual machine storage Before You Begin 📒 chongzhua from one location to another location. Choose Move Type KAOQIN KSNet Specify Destination Choose Move Options > < Summary Checkpoints • CAILIAOKU Do not show this page again Next > Cancel

Action

WL-8

1

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虚拟机的计划内迁移

File Action View Help



移虚拟机存储文件

虚拟机的计划内迁移

2、Hyper-V内计划迁移





2、Hyper-V内计划迁移 建议选择Move all of the virtual machine's data to a single location





2、Hyper-V内计划迁移 选择希望将该虚拟机迁起

选择希望将该虚拟机迁移到什么位置,该位置必须为当前Hyper-V节点能够访问到的存储位置,包括本地磁盘,共享文件夹、网络映射磁盘等

Chongzhuar ΚΔΩΩΙΝ Before You Begin Specify a l		
SNet Choose Move Type Choose Move Options Virtual Machine Checkpoints Summary Summary Size: XSNet	ation for the virtual machine's items.	>



3、Failover Cluster Manager内计划外迁移

测试迁移前,三个虚拟机正 常运行与WL-820B-A1节点





3、Failover Cluster Manager内计划外迁移

此时Failover Cluster Manager内 有2个节点正常运行





3、Failover Cluster Manager内计划外迁移

当人为将WL-820B-A1节 点机器掉电,使其模拟 宕机时,其上运行的所 有虚拟机会自动运行到 WL-820B-A 2上继续运行





3、Failover Cluster Manager内计划外迁移

提示当前虚拟机未被监 视,紧接着迁移到WL-820B-A2节点





3、Failover Cluster Manager内计划外迁移

File

迁移完成,所有虚拟机 在WL-820B-A2节点上正 常运行起来。计划外迁 移发生时,虚拟机的在 迁移完成后有重新启动 的过程。



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虚拟机的备份和还原

1、通过虚拟机快照备份一临时备份

当需要重新创建不同的计算环境并在这些环境中再现各种状况时,快照可帮助您提高效率。例如,软件开发和测试、技术支持服务以及培训课程开发。

但是,使快照在某些设置中有用且有效的强大功能和灵活性,在其他设置中却可能导致意外和潜在的严重 后果。这些后果包括在未正确管理快照时意外丢失数据的固有风险。例如,如果编辑连接到具有快照的虚 拟机的虚拟硬盘,则可能发生数据丢失。 使用快照的适当设置为开发和测试活动,包括使用虚拟机作为 暂存服务器以在将更新和修补程序部署到生产服务器之前对其进行测试。建议您不要在提供时间敏感服务 (如 Active Directory 服务)的虚拟机上使用快照,或在性能或存储空间可用性至关重要时使用快照。 此外,在开始使用快照之前,应注意以下事项:

• 获取快照将降低虚拟机的性能(在创建快照时)。对于在生产环境中提供服务的虚拟机,不应在其上使 用这些快照。

• 建议您不要在配置有固定虚拟硬盘的虚拟机上使用快照,因为这些快照会降低使用固定虚拟硬盘本应获得的性能收益。

•快照需要充足的存储空间。快照U、avhd 文件的形式存储在虚拟硬盘上的同一位置。获取多个快照可能 会快速消耗大量存储空间。使用 Hyper-W 管理器删除快照时,将从快照树删除快照,但在关闭虚拟机之前,不会删除 .avhd 文件。

• 虚拟机快照与由卷影复制服务(VSS)创建的快照不同。虚拟机快照可以是一种有用的创建虚拟机临时备份的方式,但它不能替代永久备份解决方案



虚拟机的备份和还原

1、虚拟机快照一创建

lyper-V Manager Action View Help							
Hyper-V Manager WL-820B-A1	Virtual Machines Name AD DCSChengzhong KA0QIN Menggang WIN2003K32	State Running Running Running Running Running	CPU Usage 0% 0% 0% 0% 6%	Assigned Memory 1226 MB 4096 MB 2048 MB 2048 MB	Uptime 1.18:53:45 05:02:45 06:31:12 05:55:09	Status	Configurati 8.0 8.0 8.0 8.0 8.0 8.0 8.0 8.0
	XS YXdataServer	Running Off	0%	Settings Turn Off			8.0 8.0
	Checkpoints	24/2018 - 17:36:57) - (9/28/2018 - 13:43 <32 - (10/10/2018 - 1 003<32 - (10/10/2018 - 1 003<32 - (10/10/201 1N2003<32 - (10/23 1N2003<32 - (10/23	x40) 17:53:07) 18 - 18:17:52) 1/2018 - 22:47:18) 1/2018 - 22:51:07)	Shut Down Save Pause Reset Checkpoint Revert			 • •
	WIN2003X32 Create Config Gener Notes	ed: juration ¥ersion: ⁄ation: :	9/14/2018 03:31:00 8.0 1 None	Move J Rename Enable Replicat Help	cion	Clustered: No Heartbeat: OK (Applications H	ealthy)



虚拟机的备份和还原

1、虚拟机快照一还原





虚拟机的备份和还原



在Hyper-V或者Failover Cluster Manager选中虚拟机,右键选择Setting

Hyper-V Manager							
Hyper-V Manager	rtual Machines						
₩L-820B-A2 Na	ame AD DCSChengzhong KAOQIN	State Running Running Running	CPU Usage 0% 0% 0%	Assigned Memory 1226 MB 4096 MB 2048 MB	Uptime 1.18:54:16 05:03:17 06:31:43	Status	Configurati 8.0 8.0 8.0
	Menggang WIN2003X32 XS C <u>o</u> nnect YXde S <u>e</u> ttings	Running Running	0% 0% 0%	2048 MB 4096 MB 4096 MB	05:55:41 20:41:23 18:54:11		8.0 8.0 8.0 8.0
Chi	Lurn Off Beckp Shut Down Save Pause Reset Checkpoint		0) 53:07) • 18:17:52) 018 • 22:47:18) 118 • 22:51:07)				•
	Revert Revert Move Export Rename En <u>a</u> ble Replica	ation	/14/2018 03:31:00 0)		Clustered: No Heartbeat: OK (Applications Healthy)	
	<u>H</u> elp					_	



在虚拟机的Setting画面里 ,用户可以设置虚拟机运行 的所需所有选项,其中: ♦ Network Adapter ♦ DVD Drive 两项可以在线修改 ♦ Add hardware ♦ Memory ♦ Processor ♦ IDE Controller ◆ SCSI Cintroller 等选项只能关闭虚拟机之后 修改

虚拟机参数设置: 在Hyper-V的虚拟化机制下,我们建议: 虚拟机提供的宿主机服务器CPU能力=((CPU数量*每 CPU内核数-1)-1)* 85% 虚拟机提供的宿主机服务器最大内存=宿主机服务器总内存(GB)-2 GB 虚拟机提供的宿主机服务器磁盘I/O能力=宿主机I/O每秒基准* 85% 虚拟机提供的宿主机网络I/O能力=宿主机I/O每秒基准平均字节* 85% 宿主机可支撑的虚拟机数量=宿主机服务器可提供资源/虚拟机分配资源

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虚拟机的再次配置

35	Settings for AD on WL-820B-A1	— 🗆 X
*	Hardware ^	Memory
	💕 Add Hardware	
	BIOS	Specify the amount of memory that this virtual machine can use.
	Boot from CD	<u>R</u> AM: 2048 MB
	Security	
-	Key Storage Drive disabled	Dynamic Memory
	2048 MB	You can allow the amount of memory available to this virtual machine to change dynamically within the range you set.
+	Processor 1 Virtual processor	Enable Dynamic Memory
Ξ	IDE Controller 0	Minimum RAM: 512 MB
	🗉 🕳 Hard Drive	
	WebManager-2016_3AB4F	Maximum RAM: 1048576 MB
Ξ	IDE Controller 1	Constitution and an and the black of the second sec
	DVD Drive	Specify the percentage of memory that Hyper-V should try to reserve as a burrer. Hyper-V uses the percentage and the current demand for memory to determine an
	None	amount of memory for the buffer.
	SCSI Controller	20 1 <i>n</i>
+	Network Adapter vSwitch-Storage	Memory <u>b</u> uffer: 20 v %
	💭 СОМ 1	Memory weight
	None	Specify how to prioritize the availability of memory for this virtual machine
	🛱 СОМ 2	compared to other virtual machines on this computer.
	None	Low High
	Diskette Drive	
	None	Specifying a lower setting for this virtual machine might prevent it from
*	Management	starting when other virtual machines are running and available memory is low.
	Integration Services	A Some settings cannot be modified because the virtual machine was in the following
	Some services offered	state when this window was opened: running. To modify a setting that is upayailable, ghut down the virtual machine and then
	Checkpoints	reopen this window.
	Production	
	RR Crowt Dusing Eile Location	



Virtual machine reserve(虚拟机保 留百分比):

虚拟机可用的处理器资源(全部资源为100% ,管理员可以分配给虚拟机可用CPU资源, 也就是说将CPU处理能力的一部分指定给特定 的虚拟机(使用百分比表示)。 虚拟机属 性设置中提供"虚拟机保留"选项,此设置 保证指定的百分比将提供给该虚拟机。此设 置将影响一次可以运行的虚拟机的数量,如 果指定多台虚拟机,虚拟机使用的CPU资源超 过100%,则按照虚拟机启动的先后顺序,未 超出物理CPU处理能力的虚拟机可以正常启动 ,超出物理CPU处理能力的虚拟机将不能启动 .为了保证虚拟机具有足够的计算资源,虚拟 机指派CPU应该为一种简单且行之有效的方法

S	Settings for AD on WL-820B-A1	- 🗆 X
*	Hardware ^	Processor
	Add Hardware BIOS Boot from CD Security Key Starsge Drive disabled	You can modify the number of virtual processors based on the number of processors on the physical computer. You can also modify other resource control settings. Number of virtual processors
	Memory	Resource control
	2048 MB	You can use resource controls to balance resources among virtual machines.
+	Processor 1 Virtual processor	Virtual machine <u>r</u> eserve (percentage):
-	IDE Controller 0	Percent of total system resources: 0
	Hard Drive WebManager-2016_3AB4F	Virtual machine limit (percentage):
-	DVD Drive	Percent of total system resources: 6
		Relative weight: 100
+	Network Adapter vSwitch-Storage COM 1 None	Some settings cannot be modified because the virtual machine was in the following state when this window was opened: running. To modify a setting that is unavailable, shut down the virtual machine and then reonen this window.
	COM 2 None	
	Diskette Drive	
*	Management	
	X Name AD	
	Integration Services Some services offered	
	Checkpoints Production	
	E Cmart Daging Eile Location	



Virtual machine limit(虚拟机限 定百分比):

限定虚拟机可用的CPU利用率 虚拟机可用的处理器资源(全部资源为100%),可以指定虚拟机使用的CPU资源(使用百分比表示),也就是说可以限制虚拟机使用的CPU资源。 虚拟机属性设置中提供"虚拟机限制"选项,此设置保证虚拟机可以使用的最大CPU处理能力。虚拟机使用的CPU资源超出限制值,则使用CPU最高值为设置值(百分比)

当宿主机中具备一定数量的虚拟机时,建 议通过基准测试计算出每个虚拟机应用占 用的最大CPU利用率,然后通过"虚拟机限 制"选项为每个虚拟机指派限制值。 这 样即便有多个虚拟机达到应用峰值,也不 会影响其他虚拟机处理能力,确保系统平 稳运行。

2	Setti	ngs for AD on WL-820B-A1	$-\Box$ >
*	Ha	rdware	Processor
	•	Add Hardware BIOS Boot from CD Security	You can modify the number of virtual processors based on the number of processors on the physical computer. You can also modify other resource control settings.
		Key Storage Drive disabled	Resource control
	-	2048 MB	You can use resource controls to balance resources among virtual machines.
÷		Processor 1 Virtual processor	Virtual machine reserve (percentage):
-	•	IDE Controller 0 Hard Drive WebManager-2016, 3AB4E	Percent of total system resources: 0 Virtual machine limit (perceptage): 100
		IDE Controller 1	Percent of total system resources: 6
+	¢	SCSI Controller Network Adapter ySwitch-Storage	Relative weight:
	P	COM 1 None	state when this window was opened: running. To modify a setting that is unavailable, shut down the virtual machine and then reopen this window.
	P	COM 2 None	
	H	Diskette Drive None	
*	Ma	nagement	
	ľ	Name AD	
		Integration Services Some services offered	
	Ċ	Checkpoints Production	
	RR	Conset Dansing Eile Logation	



Relative weight(CPU资源优先级): 在同一台宿主计算机中,有多个虚拟机运行 并且争用CPU资源时,管理员可以设置虚拟机 使用CPU的优先级别。

虚拟机属性设置中提供"相对权重"选项, 此设置虚拟机优先级,优先级别默认设置为 100,即每个虚拟机优先级相同,优先级可用 区间是1-10000。

当出现争夺资源的状况时,根据时间片轮转 均衡的非配给虚拟机CPU资源。 启动优先级 设置后,优先级高的虚拟机将首先得到CPU资 源





添加虚拟磁盘

为已经存在的虚拟机添加另外的虚拟磁盘。

先添加一个硬盘控制器,然后在新的 硬盘控制器下选择新建虚拟硬盘,配 置新硬盘的存储容量后,完成配置 启动虚拟机,在操作系统的磁盘管理 内查看新加的硬盘,创建为本机的简 单卷即可

虚拟机的再次配置

* Hardware	IDE Controller
Add Hardware	
BIOS	You can add hard drives and CD/DVD drives to your IDE controller.
Boot from CD	Select the type of drive you want to attach to the controller and then click Add.
Key Storage Drive disabled	Hard Drive
Memory 2048 MB	DVD Drive
Processor	
1 Virtual processor	
IDE Controller 0	Ago
WebManager-2016 3AB4F	You can configure a hard drive to use a virtual hard disk or a physical hard disk after
IDE Controller 1	you attach the drive to the controller.
DVD Drive	
None	
SCSI Controller	
Vetwork Adapter	
vSwitch-Storage	
None	
COM 2	
None	
📕 Diskette Drive	
None	
Management	
I Name	
Integration Services	
Some services offered	
Checkpoints	
Production	
E Crowt Doging File Location	



Network Adapter 网络适配器 用户可以自行修改本虚拟机的网络连 接到那个虚拟交换机,并且根据实际 网络规划选择是否启用VLAN

虚拟机的再次配置





北京伟联科技有限公司

Wisdom Industrial Solution Consultant