# CİSCO CATALYST 9800-CL WLC KURULUM & KONFİGÜRASYON DOKÜMANI

Kübra Yüksel

## 1) Hypervisor Desteği

Cisco Catalyst 9800-CL Wireless Controller hypervisor gereksinimleri aşağıdaki gibidir.

Table 1.	Supported hypervisor versions for the 9800-CL private cloud running 17.6	.x.

Hypervisor	Supported version
VMware ESXi	ESXi vSphere: 6.0, 6.7, and 7.0 ESXi vCenter: 6.0, 6.5, 6.7, and 7.0
KVM	Red Hat Enterprise Linux: 7.6, 7.8, and 8.2 Ubuntu: 16.04 LTS, 18.04 LTS, 20.04.5 LTS
Microsoft Hyper-V <sup>1</sup>	Microsoft Windows Server: 2016 or 2019 (Standard, Enterprise, and Datacenter) Hyper-V Manager: 10.0.14393
Cisco NFVIS	Release 3.8.1 and 3.9.1

<sup>1</sup> Supported only on Cisco IOS XE Amsterdam 17.1.1 or later

## 2) Sistem Gereksinimleri

Cisco Catalyst 9800-CL Wireless Controller sistem gereksinimleri aşağıdaki gibidir.

able 2. Minimum virtual resource requirements for small, medium, and large configurations										
	Existing support Release 17.3	ed templates pre	Cisco IOS XE	Templates add Release 17.3	ed as part of Cis	co IOS XE				
Model configuration	Small (Low throughput)	Medium (Low throughput)	Large (Low throughput)	Small (High throughput)	Medium (High throughput)	Large (High throughput)				
Minimum number of vCPUs <sup>1</sup> (hyperthreading is not supported)	4	6	10	7	9	13				
Minimum CPU allocation (MHz)	4000	6000	10,000	4000	6000	10,000				
Minimum memory (GB)	8	16	32	8	16	32				
Required storage <sup>2</sup> (GB)	16	16	16	16	16	16				
Virtual NICs (vNICs)	2/(3)*	2/(3)*	2/(3)*	2/(3)*	2/(3)*	2/(3)*				
(*) Third NIC is for High Availability										
ESXi vNIC	VMXNET3	VMXNET3	VMXNET3	VMXNET3	VMXNET3	VMXNET3				
Linux KVM vNIC	OVS	OVS	OVS	OVS	OVS	OVS				
	Linux bridge (brctl)	Linux bridge (brctl)	Linux bridge (brctl)	Linux bridge (brctl)	Linux bridge (brctl)	Linux bridge (brctl)				
KVM NIC virtualization	Virtio	Virtio	Virtio	Virtio	Virtio	Virtio				
Hyper-V vNIC	NETVSC	NETVSC	NETVSC	NETVSC	NETVSC	NETVSC				
Hyper-V NIC Virtualization	VMBus	VMBus	VMBus	VMBus	VMBus	VMBus				
Maximum access points	1000	3000	6000	1000	3000	6000				
Maximum clients supported	10,000	32,000	64,000	10,000	32,000	64,000				
vMotion, vNIC teaming, Snapshot, DRS <sup>3</sup>	Supported	Supported	Supported	Supported	Supported	Supported				

## 3) 9800-CL Software İçin Gerekli Ova Dosya Formatı

Cisco 9800-CL için gerekli OVA dosyasına aşağıdaki linkten ulaşabilirsiniz.

https://software.cisco.com/download/home/286322605/type/282046477/release/Bengaluru-17.6.4

#### Catalyst 9800-CL için OVA template (OVA) : C9800-CL-universalk9.BLD\_V\*\*\*.ova

Downloads Home / Wireless / Wireless LAN Controller / Standalone Controllers / Catalyst 9800 Wireless Controllers for Cloud / Catalyst 9800-CL Wireless Controller for Cloud / IOS XE Software- Bengaluru-11.6.4(MD)

Q Search	$\supset$	Catalyst 9800-CL Wireless Control	ller for Clou	ıd	
Expand All Collapse All		Release Bengaluru-17.6.4 MD	Related Links an Release Notes for 980	d Documentation ₀-c⊾	
Suggested Release	$\sim$				
Bengaluru-17.6.4(MD) 😒					
Amsterdam-17.3.6(MD) 😋		Cisco is aware of an issue affecting image validation at software upgrave recommend following the workarounds mentioned in the bug CSCwd80	des or downgrades in the 0290.	e Cisco IW3702 Wave 1/IOS Access	Points. We
Latest Release	$\sim$				
Dublin-17.11.1(ED)		File Information	Release Date	Size	
Amsterdam-17.3.7(MD)		Cisco Catalyst 9800 Wireless Controller for Cloud. 🔒 C9800-CL-universalk9.17.06.04.SPA.bin	18-Aug-2022	1021.67 MB	<u>+</u> \;
Cupertino-17.9.3(ED)		Advisories 📑			
Bengaluru-17.6.5(MD)		Cisco Catalyst 9800 Wireless Controller for Cloud - Hyper-V / ESXi / KVMo	18-Aug-2022	1031.62 MB	<u>+</u> \:
All Release	~	C9800-CL-universalk9.17.06.04.iso Advisories			
17	>	Cisco Catalyst 0200 Wireless Controller for Claud - Hyper-V / ESVi	18-Aug-2022	1032 97 MB	+ \ /
16	>	/ KVM	10-Aug-2022	1032.97 MB	- <del>-</del> +
Deferred Release	~	C9800-CL-universalk9.17.06.04.ova Advisories 📑			

## 4) ESXI Üzerinde Cisco 9800-CL Kurulumu

#### 4.1) Interface Arabirimleri



Catalyst 9800-CL, Gigabit Ethernet interfacelerini VM tarafından atanan logical vNIC adıyla eşleştirir. VM, logical vNIC adını fiziksel bir MAC adresine eşler. Catalyst 9800-CL ilk kez kurulurken, router interfaceleri VM oluşturulduğunda eklenen logical vNIC arabirimleriyle eşlenir.

Üç adet interface vardır. Kurulum gerçekleştirirken aşağıdaki düzende seçmeliyiz.

- GigabitEthernet1: Device management interface
- GigabitEthernet2: Wireless management interface
- GigabitEthernet3: High Availability interface
- Eğer 9800-CL'de client'lar için farklı vlanlara izin vermek amacıyla farklı data paketlerini geçirecekseniz interfacelerin her biri kendi vSwitch'inde olmalıdır. Catalyst 9800 temelde kablosuz özelliklere sahip bir switchtir. Aynı vSwitch üzerinde bu interfacelerin birden fazlasının bulunması, port channel olmadan multiple link kullanarak iki switch'i birbirine bağlamak gibidir. Loop oluşmaması için iki interfacesi tek bir networke bağlamamalıyız.

• Interfaceleri silecekseniz, bunu VM'i kurulum sonrası ilk kez çalıştırmadan önce yapmalısınız. Örneğin GigabitEthernet 2'yi silecekseniz kurulum esnasında gerçekleştirin ve VM'i öyle çalıştırın.

#### 4.2) ESXI Üzerinde Interface Ayarları

İlk adımda portlarımızı oluşturmalıyız. Management için ve Trunk için portlar create etmeliyiz. Portları oluştururken farklı **vSwitch** seçimi yapmalıyız. Çünkü birden fazla interface kullanacağız. Eğer tek bir interface kullanacak olsaydık tek bir vSwitch kullanmak yeterli olurdu.

vm ESXi Host Client							root(	¢192.	.168.11.100 •   Help •   Q	Sea	rch	
☆ Navigator 《	👰 localhost.localdomain - Net	tworking										
√ 🖡 Host	Port groups Virtual switches	Physic	al NICs VMker	nel NICs TO	CP/II	P stacks Firewall ru	lles					
Manage												
Monitor	+ Add port proup	🖻 Edit set	tings   C R	efresh i i	¢ A	ctions			Q Searc	ch		
🛱 Virtual Machines 0	Name	~	Active ports $ \sim $	VLAN ID	~	Туре	~	vSv	vitch ~	V	/Ms v	
Storage 1	VM Network		0	0		Standard port group			vSwitch0	C	)	
Volter Networking 1	Management Network		1	10		Standard port group			vSwitch0	Ν	J/A	
vmk0											2 items	
	🖄 Recent tasks											
	Task	~ Target	~	Initiator	~	Queued ~	Started	~	Result 🔺 🗸 🗸	C	ompleted <b>v</b>	~
	Update Options	localhos	localdomain	root		03/27/2023 21:32:54	03/27/2023 21:32:5	4	Completed successfully	03	3/27/2023 21:32:5	54
	Auto Start Power On	localhos	localdomain	root		03/27/2023 21:26:01	03/27/2023 21:26:0	1	Completed successfully	03	3/27/2023 21:26:0	b1

• Vlan ID: 4095 ile bütün vlanlara izin verdiğini belirttik.

Navigator     ≪       ↓ Host     Manage       Monitor     ๗ Virtual Machines	Incalhost.localdomain       Port groups     Virtual swith       +Q     Add port group       Name	Networking ↑© Add port group - Trunk Name	Trunk	v vswitch	≷ Search → VMs →
Storage     1       Image     td=""><td>VM Network Management Netw</td><td>VLAN ID Virtual switch Security Promiscuous mode</td><td>4095 vSwitch0 ~ Accept O Reject O Inherit from vSwitch</td><td>Switch0</td><td>0 N/A 2 items</td></t<>	VM Network Management Netw	VLAN ID Virtual switch Security Promiscuous mode	4095 vSwitch0 ~ Accept O Reject O Inherit from vSwitch	Switch0	0 N/A 2 items
	Recent tasks Task Update Options Auto Start Power On	MAC address changes Forged transmits	Accept O Reject Inherit from vSwitch Accept O Reject Inherit from vSwitch	Result      Completed successfully 21.22.54 Completed successfully Completed successfully	Completed * v 0.3/27/2023 21:32:54 0.3/27/2023 21:26:01

• Security de accep alanlarının ikiside WLC'nin 802.1Q etiketlerini geçebilmesi için gereklidir

∨ 📑 Host		Port groups Virtual swite	thes Physic	al NICs – VMker	nel NICs	ICP/	IP stacks Firewall rules	
Manage Monitor		+ Add port group	🖋 Edit set	tings   C R	efresh	¢	Actions	
🗗 Virtual Machines	1	Name	~	Active ports $\checkmark$	VLAN ID	~	Туре	`
Storage	1	Ø ManagementVLAN		0	10		Standard port group	
∨	2	Ø Trunk		0	4095		Standard port group	
tig vmk0		Ø VM Network		0	0		Standard port group	

Oluşturduğumuz portları aşağıdaki gibi görebiliriz.

Trunk olsun ya da olmasın, portlar için ESX üzerinde aşağıdaki securty ayarının muhakkak yapılması gerekmektedir.

General	Promiscuous mode:	Accept	
Advanced	MAC address changes:	Reject	
Security	Eorned transmits	Accent	

# 4.3) ESXI Üzerinde OVA Kurulumu

• Interfacelerimiz hazır. Şimdi Ova dosyasını deploy etmeye geçebiliriz. 'Create / Register VM ' butonu ile kurulumu başlatıyoruz.

vm	ESXi Host Client					root@192	168.11.100 - Help -	Q Search
ß N	lavigator 🔇	ලී localhost.localdomain	Virtual Machines					
$\sim$ .	Host	The Create / Demister	VM I Console I P.		er off		resh Actions	
	Manage	La create / remister	Console P	ower on O Pow			resit se Actions	Search
	Monitor							
- Gi	Virtual Machines	Virtual machine	✓ Status	<ul> <li>Used space</li> </ul>	✓ Guest OS	✓ Host n	ame v Host C	PU V Host memory.
	Storage			No vii	rtual machines			
		Quick filters	~					No items to display
		Recent tasks						
		Task	✓ Target ✓	Initiator ~ Que	ued ~	Started ~	Result 🔺	✓ Completed ▼
		Update Options	localhost.localdomain	root 03/2	7/2023 21:32:54	03/27/2023 21:32:54	Completed successfully	03/27/2023 21:32:54
		Auto Start Power On	localhost.localdomain	root 03/2	7/2023 21:26:01	03/27/2023 21:26:01	Completed successfully	03/27/2023 21:26:01
vm	ESXi Host Client					root@192	.168.11.100 • Help •	Q Search
	Navigator	《	- Virtual Machines					
~[	] Host <sup>+</sup> @ N	lew virtual machine						
	Manage	Colort motion time	Select creation type					Search
		Select creation type	How would you like to create a V	firtual Machine?				Host memory
ġ	Virtual Machines 2	Select OVF and VMDK files						Hosemenorye
~6	Networking	Select storage	Create a new virtual machine		This optio	n guides you through	the process of creating a	No items to display
	🖳 vmk0	License agreements	Deploy a virtual machine from a	n OVF or OVA file	Virtuei me	chine nom an Ove an	U VMDK mes.	No items to display
3	VM Network 5	Deployment options	Register an existing virtual mach	hine				
	More networks	Additional settings						
	7	Ready to complete						
								10
								Completed a
								Completed *

BACK

NEXT FINISH CANCEL

• Sanal Makineye isim verip, OVA dosyasını seçiyoruz.

vm ESXi Host Clie	ent	root∉192.168.11.100 +   He	p 👻 📔 🔍 Search
G Navigator ✓ □ Host Manage	《 】 @ localhost.localdomain 督 New virtual machine - WL	- Virtual Machines C	
Monitor	1 Select creation type 2 Select OVF and VMDK files	Select OVF and VMDK files Select the OVF and VMDK files or OVA for the VM you would like to deploy	Search V
Storage ✓ Q Networking ⊂ vmk0 > Q VMN Network More networks	Select storage     License agreements     Deployment options     Additional settings     Ready to complete	Enter a name for the virtual machine  WLC  Virtual machine names can contain up to 80 characters and they must be unique within each ESXI instance.  C9800-CL-universalk9.17.06.04.ova	No items to display
	_	BACK NEXT FINISH CANCEL	Completed • • • • • • • • • • • • • • • • • • •

• Sanal makinenin bulunacağı Datastor'u seçiyoruz.

vm ESXi Host Client	and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second sec		root@192.168.11.100 +   Help +	Q Search
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Manage	New virtual machine - WL	c.		
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Storage √ Q Networking <sup>1</sup> C, vmk0 > Q VM Network More networks.	3 Select storage       4 License agreements       5 Deployment options       6 Additional settings       7 Ready to complete	Standard         Persistent Memory           Select a datastore for the virtual machine's configuration files and all of its virtua           Name         Capacity          Free         Type           datastoret         94.75 GB         93.34 GB         VMFS6	disks. • Thin provisk Access • Supported Single	No items to display
			1 items	
				1
				✓ Completed ▼
				03/27/2023 21 35 08 03/27/2023 21 35 08
		BACK	FINISH	03/27/2023 21.32 54 03/27/2023 21 26 01

- Deployment opsiyonlarını (Network Mappings, Scale, Disk Provisioning, vb.) seçiyoruz.
- 'Power on automatically' seçeneğinin seçilmediğinden emin olalım.

ect creation type ect OVF and VMDK files ect storage	Deployment options Select deployment options					
eployment options leady to complete	Network mappings	GigabitEthernet1 GigabitEthernet2 GigabitEthernet3	ManagementVlan Trunk VM Network	> > >		
	Deployment type	1K APs, 10K Clie	ents			
		4 vCPU, 8 GB RAM	M, 3 VNICs, 8 GB Disk			
	Disk provisioning	Thin O Thick				
	Power on automatically	0				
						AP ve Client ölçeğini seçelim
Deployment type	✓ 1K APs, 10K Cli 1K APs, 10K Cli	ents ents, High Throughpu	ut			
Disk provisioning	3K APs, 32K CI 3K APs, 32K CI	ients ients, High Throughp	ut			
Power on automatically	6K AP5, 64K CI 6K AP5, 64K CI	ients ients, High Throughp	ut			

• Ayarları kontrol edip 'Finish' butonuna tıklayabiliriz.

Task       Target       Initiator       Queued       Standd       Result       Complete         Upgest data<       QB000-QL-guipement Quebe ESX       ext       M0020201110031       Q0220201110031       Q022020110031       QUeued       Result       Queued       QUEued <th>ak a virtual machine - C9800-CL-Deployment-Guide-ESXI   New virtual machine - C9800-CL-Deployment-Guide-ESXI   New virtual machine - C9800-CL-Deployment-Guide-ESXI   Select atorage  Complete  Product  Product  Cisco C9800-CL, Wireless Lan Controller  VM Name  C9800-CL-Deployment-Guide-ESXI  Product  Cisco C9800-CL, Wireless Lan Controller  VM Name  C9800-CL, Universalds, yga.17.05.01.iso  Datastore  Guest OS Name  Cisco IOS-XE Software  Provisioning type  Thi  Network mappings  GigabitEthermet1: Lab Network, GigabitEthermet2: Trunk_9300, GigabitEthermet3: R  edundancy  Guest OS Name  Cisco IOS-XE Software  Profile  4 vCPU, 8 GB RAM, 3 VNICs, 16 GB Disk</th> <th>Recent tasks</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>	ak a virtual machine - C9800-CL-Deployment-Guide-ESXI   New virtual machine - C9800-CL-Deployment-Guide-ESXI   New virtual machine - C9800-CL-Deployment-Guide-ESXI   Select atorage  Complete  Product  Product  Cisco C9800-CL, Wireless Lan Controller  VM Name  C9800-CL-Deployment-Guide-ESXI  Product  Cisco C9800-CL, Wireless Lan Controller  VM Name  C9800-CL, Universalds, yga.17.05.01.iso  Datastore  Guest OS Name  Cisco IOS-XE Software  Provisioning type  Thi  Network mappings  GigabitEthermet1: Lab Network, GigabitEthermet2: Trunk_9300, GigabitEthermet3: R  edundancy  Guest OS Name  Cisco IOS-XE Software  Profile  4 vCPU, 8 GB RAM, 3 VNICs, 16 GB Disk	Recent tasks							
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exed dat-web_basks.wndk (2 of 2) in ot 00/290201110031 00/290201110031 00/290201110031 00/290201110031 00/2902011103236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/2902011193236 00/290201119326 00/2902011193236 00/290201119326 00/290201119326 00/290201119326 00/290201119326 00/290201119326 00/290201119326 00/290201119326 00/290201119326 00/290201119326 00/290201119326 00/290201119326 00/290201119326 00/290201119326 00/290201119326 00/29020119326 00/290201119326 00/290201119326 00/290201119326 00/290201119326 00/290201119326 00/29020119326 00/29020119326 00/29020119326 00/29020	and dia-web_baddia.umdb (p d?)   ard Wey   wex   below   wex   below   ard Wey   wex   below   below   below   complete     below   below   complete     below   complete     below   complete     complete     complete     complete     complete     complete     complete     complete     complete     complete     complete     complete     complete     complete     complete     complete     complete     complete     complete     complete     complete     complete     complete     complete     complete        complete	oad disk - C9800-CL-universalk9_vga.17.05.01.iso (1	C9800-CL-Deployment-Guide-ESXI	root	06/29/2021 11:00:31	06/29/2021 11:00:31		0	Running 3 %
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• Ayarlamaları tamamladıktan sonra 'power on' butonu ile çalıştırabiliriz.

✓ ■ Host Manage Monitor	+ Create / Register VM   🗖	Console   Por	ver (m) () Power	off 🚺 Suspend	C Refresh 🛛 🌣	Actions Q Search	
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vm ESXi Host Client					root@19	92.168.11.100 • Help •	Q Search
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	Upload disk - C9800-CL-universalk9	WLC	root	03/27/2023 21:37:11	03/27/2023 21:37:11	Completed successfully	03/27/2023 21:37:35
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vm ESXi Host Client				root@1	92.168.11.100 •   Help •	Q Search
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Refresh Network System	localhost.localdomain	root	03/27/2023 21:37:27	03/27/2023 21:37:27	Completed successfully	03/27/2023 21:37:27

Burada CLI ekranı üzerinden interface'e ip verme, vlan create etme gibi işlemler gerçekleştirebiliriz.

vm ESXi Host Client					root@192	168.11.100 🕶 🛛 Help	▼   Q Search
h Navigator ≪	🗟 localhost.localdomain - Virtu	al Machines					
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✓     Host       Manage     Monitor       ✓     Virtual Machines     1       ✓     Storage     1       ✓     Networking     3       ✓     vswitch0     3       ✓     vswitch0     4       ✓     VH Network     More networks	Har 27 18:42:33.238 pnp-tech/pnp-tech-di +Mar 27 18:42:33.595 P Agent Discovery fr +Mar 27 18:42:33.695 P Agent Discovery fr Har 27 18:42:33.671 P Agent Discovery fr HLC(config-if)# +Mar 27 18:42:33.974 g Hizard) HLC(config-if)# HLC(config-if)# HLC(config-if)# Stop Autoip process	: %PNP-6-PNP_SA SCOVERY-SUMMARY : %SYS-5-CONFIG om console as v : %SYS-5-CONFIG om console as v : %SYS-5-CONFIG om console as v : %PNP-6-PNP_TE : %PNP-6-PNP_DI	VING_TECH_SU ) Please P: Configur ty0 P: Configur ty0 P: Configur ty0 CH_SUMMARY_S ed_successfu SCOVERY_STOP	MMARY: Saving I Hait. Do not in red programmatic red programmatic red programmatic (AVED_OK: PnP tr IIV (elapsed t PED: PnP Discov	PIP tech summary nterrupt. cally by process cally by process cally by process ech summary (/pp ime: 0 seconds). very stopped (Cd	Action s Pn S Pn Host S Pn OMH	IS Q Search CPU V Host memoryk. z O MB 1items _a CFU 10.1 GHz MEMORY 4.78 GB E
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	Import VApp	Resources	root	03/27/2023 21:37:05	03/27/2023 21:37:05	Completed successfully	03/27/2023 21:37:35
	Upload disk - C9800-CL-universalk9	WLC WLC	root	03/27/2023 21:37:11	03/27/2023 21:37:11	Completed successfully	03/27/2023 21:37:35
	Refresh Network System	localhost.localdomain	root	03/27/2023 21:37:27	03/27/2023 21:37:27	Completed successfully	03/27/2023 21:37:27

Göründüğü gibi, Cisco 9800 WLC üzerinde 17.06.04 software'ı çalışmaktadır.

Ova dosyası kurduğunuz sistemde VCenter varsa aşağıda yer alan bilgiler kurulum esnasında gelecektir. Biz sadece ESXI 7.0 versiyonunu kurduk ve bu bilgileri istemediği için bir sonraki adımda CLI ekranı üzerinden management interface'imize ip adresi vererek kurulumu tamamlayıp web arayüzüne ulaşacağız.



Vcenter ile kurulujm için detaylara 8 No'lu bölümdeki kaynaklardan detaylara ulaşabilirsiniz.

## 5) Web Arayüzüne Erişim

WLC için kullanacağımız Management IP: 192.168.11.3 'tür. Initial config işlemlerini tamamladıktan sonra '<u>https://192.168.11.3</u> ' adresi ile web üzerinden erişim sağlayabiliriz.

• CLI aracılığıyla 9800-CL Konfigürasyonu : Initial Konfigürasyon

#### Would you like to enter the initial configuration dialog? [yes/no]: no

Would you like to terminate autoinstall? [yes]: yes

#### WLC(config)#user admin privilege 15 password A123456!

• Açılan CLI ekranı üzerinden Management interface olan GigabitEthernet 1'e ip adresi veriyoruz.

WLC(config)# interface GigabitEthernet 1

WLC(config-if)#no switchport

WLC(config-if)#ip address 192.168.11.3 255.255.255.0

• Web arayüzüne erişmek için default route yazalım.

#### WLC(config)# ip route 0.0.0.0 0.0.0.0 192.168.11.1

Wireless yönetimi için management interface'i belirtmeniz, sertifika oluşturmanız ve sertifika kurulumunu doğrulamanız gerekir. Sertifika noktası yapılandırmasını atlarsanız AP'ler register olamaz. Ancak, GUI'ye gidebilir ve istenen sertifikayı alarak yapılandırabilirsiniz.

WLC(config)# wireless management interface GigabitEthernet 1

#### WLC(config)# exit

WLC# wireless config vwlc-ssc key-size 2048 signature-algo sha256 password 0 A123456!

#### WLC# show wireless management trustpoint

• Konfigürasyondan sonra <a href="https://192.168.11.3">https://192.168.11.3</a> adresine giderek arayüzün gelip gelmediğini kontrol edelim.

← → C ▲ Not secure   https://192.168.11.3/webui/		🖻 🏠 뷹 🔲 😩 🗄
	cisco	and the second second second second second second second second second second second second second second second
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Copyright © 2005-2022 by Cisco Systems, Inc. All rights res affiliates in the United States and certain other countries. All Chrome 59 <sup>°</sup> .	erved. Cisco, the Cisco logo, and Cisco Systems are registe third party trademarks are the property of their respective ov	red trademarks or trademarks of Cisco Systems, Inc. and/or its wners. Best viewed with Edge 40 <sup>+</sup> , Firefox 60 <sup>+</sup> , Safari 10 <sup>+</sup> ,

• CLI ekranı üzerinden oluşturduğumuz username ve password ile girişimizi gerçekleştirdikten sonra temel ayarlamaları yapıp, WLC'nin tamamen çalışır durumda olmasını sağlamak için Configuration Setup Wizard'ı tamamlamak gerekir.

← → C ▲	Not secure   https://192.168.11.3	3/webui/#/dayzeroWireless	ie 🛧 🛊
cisco	Configuration Set	up Wizard	
	1. General Settings		
	Deployment Mode	Standalone 🗸	~
	Host Name*	WLC	
	Country	TR	
	Date	27 Mar 2023	
	Time / Timezone	22:11:26 GMT03 •	
	NTP Servers	Enter NTP Server	
		Added NTP servers	
			•
			Next

Burada Wireless Management Settings sekmesinde port number belirtirken GUI'ye erişmek için kullandığımız interface'den farklı bir interface seçmeliyiz. Bu durumda Gig1'i kullandığımız için burada Gig2 ya da Gig3'ü seçebiliriz. VLAN'ı, IP adresini ve subnet mask'ı seçerek interface'i yapılandırın. Böylelikle, şunlar otomatik olarak yapılandırılmış olur;

- Trunk Interface
- Wireless Management için SVI interface
- Subnet Mask

← → C ▲	Not secure   https://192.168.11.3/webui	i/#/dayzeroWireless			6 \$	*
cisco	Configuration Setup \	Wizard				
	1. General Settings					
					•	
	Wireless Management Settings		Static Route Settings			
	Port Number	GigabitEthernet2 🗸	There are no routes configured currently			
	Wireless Management VLAN*	10	IPv4 Route	0		
	IPv4	Ø	IPv6 Route	0		
	Wireless Management IP*	192.168.11.3			- 1	
	Subnet Mask*	255.255.255.0			- 1	
	IPv6	0			- 1	
					-	
					Next	

Next dedikten sonra client'ların bağlanabilmesi için WLAN ekleyebilirsiniz. Bu tamamen optional'dır. İsterseniz next diyip geçebilir daha sonra ekleme yapabilirsiniz.

cisco Con	figuration Setup Wizard		
	2. Wireless Network Settings		
	+ Add × Delete		
	Network Name		Network Type
	H = 0 ► ► 10 • Items per page		
		Add Network	×
		Network Name*	Enter Network Name
		Network Type	Employee Guest
		Security	WPA2 Personal ¥
		Pre-Shared Key*	
		່ ວ Cancel	+ Add

• Sonraki sayfada RF parametre ve AP sertifika ayarlarını yapılandırabiliriz. Virtual IP adresini yazabiliriz.

$\leftrightarrow$ $\rightarrow$ C $\blacktriangle$	Not secure   https://192.168.11.3/	webui/#/dayzeroWireless				₽ \$	3
cisco	Configuration Setu	ıp Wizard					
	3. Advanced Settings						
	Client Density	Low	Typical	High		*	
	RF Group Name*	default					
	Traffic Type	Data and Voice 🔹					
	Virtual IP Address	192.0.2.1					
	AP Certificate						
	Generate Certificate	YES					
	RSA Key-Size	2048 🔻					
	Signature Algorithm	sha1 👻				-	
	D 14	den a co			Previous	ary	

 Trustpoint, dolaylı olarak güvenilen bir sertifika yetkilisidir. Bir trustpoint sertifikası kendinden imzalı bir sertifikadır, dolayısıyla başka birinin veya başka bir tarafın güvenine dayanmadığı için "trustpoint" adı verilir. Bir AP'nin 9800-CL'ye katılması için trustpoint gerekir. İlk kurulum sırasında otomatik olarak oluşturulabilir. Aksi takdirde burada Generate Certificate 'No' olarak seçilirise bu kurulum tamamlandıktan sonra AP'lerin katılması için bir sertifika yetkilisinin yapılandırılması gerekir.

← → C ▲	Not secure   https://192.168.11.3/webui/	/#/dayzeroWireless		Ŀ.	☆	* 🗆
cisco	Configuration Setup V	Vizard				
	3. Advanced Settings					
	Generate Certificate	YES			•	
	RSA Key-Size	2048 🔻				
	Signature Algorithm	sha1 💌				
	Password*	Admin123456!			1	
	Create New AP Management Us	ser (optional)				
	New AP Management User	admin	<u> </u>			
	Password	Admin123456!				
	Secret	Admin123456!				
					¥	
			Previous Sum	mary		

• Summary dedikten sonra yapılan config görünmektedir.

€ → G 🔺	Not secure   https://192.168.11.3/webui/#/da	ayzeroWireless	i£ ★
cisco	Configuration Setup Wiz	zard	
	4. Summary		
	✓ General Settings		
	Deployment Mode	standalone	
	Host Name	WLC	
	Country	TR	
	Date	27 Mar 2023	
	Time / Timezone	22:11:26 / GMT0300	
	Wireless Management Settings		
	Port Number	GigabitEthernet2	
	Wireless Management VLAN	10	
	Wireless Management IP	192.168.11.3	
	Subpot Mock	255 255 255 0	

- ← → C ▲ Not secure | https://192.168.11.3/webui/#/dashboard ie 🗴 🛪 🖬 😩 🗄 Cisco Catalyst 9800-CL Wireless Controller T A B & 0 0 C Q × 🕩 Dashboard =  $\mathbf{O}$ 0 0 0 0 (p) 0 🕐 Mor 6 1 (1) Overview t++ Access Points Access Point Join Summary Radio Count by Band Radio Count by Mode 55 No AP Join data available
- Finish dedikten sonra web arayüzümüze erişim sağlayabiliriz

## 6) Basic Wireless Konfigürasyonu ve Flex Mode

• SSID yayını yapmak için yapacağımız ilk adım Vlan create etmek olacaktır.

Cisco Catal	lyst 9800-CL Wireless Cont	roller			Welcome admin   🏘 🕫 🖺 🔅
Q. Search Menu Items	VLAN		Edit VLAN: LAB-WIR	RELESS-USERS	
	SM VEAN	VLAN Group	VLAN ID*	20	
📰 Dashboard		VLAT GIOLP	Name	LAB-WIRELESS-USERS	
Monitoring >	+ Add X Delete		Stato		
🔾 Configuration 🔷 🔸	VLAN ID	< Name	RA Throttle Policy	None	
(c) Administration →		default	IGMP Snooping	ENABLED	
Troubleshooting	20	LAB-WRELESS-USERS	ARP Broadcast	DISABLED	
	4 4 1 ⊨ H 10	Items per page	Port Members		Q, Search
				Available (3)	Associated (0)
				Gi1	•
				Gi2	•
				Gi3	•
					No Associated Members
					*
이는 것을 많이 많이 많이 많이 많이 했다.					

Add VLAN for wireless users

Vlan create ettikten sonra data interfacelerinin oluşturduğumuz Vlanlara izin verdiğini doğrulamalıyız.

Eğer port channel kullanıyorsak;

- Configuration> Interface> Logical> PortChannel name> General ayarına gidelim.
- Allowed Vlan = All yapılandırmasının olduğunu doğrulayalım.
- Eğer Allowed Vlan = Vlan ID ise izin verilmesi istenilen Vlan ID'leri kutucuğa ekleyelim.

infigure Interface Gigabit	Ethernet2	
General Advanced		
interface	GigabitEthernet2	
Description	(1-200 Characters)	
Admin Status	UP	
Port Fast	disable •	
Enable Layer 3 Address	DISABLED	
Switchport Mode	trunk	
Allowed Vlan	🔿 All 🧿 Vian IDs	
Vian IDs	210,2602,2685,2601 (e.g., 2,4,6-10)	
Native Vian	1	

Port cahnnel kullanmıyorsak;

- Configuration> Interface> Ethernet> Interface Name> General ayarına gidelim.
- Allowed Vlan = All yapılandırmasının olduğunu doğrulayalım.
- Eğer Allowed Vlan = Vlan ID ise izin verilmesi istenilen Vlan ID'leri kutucuğa ekleyelim.

- Burada L3 Firewall üzerinde sonlanıyorsa Vlan create ettikten sonra SVI oluşturmaya gerek yoktur. Sadece Vlan create etmek yeterlidir. Kullanıcı VLAN'ları için herhangi bir SVI varsa, bunları silin, mdns veya dhcp relay ihtiyacınız olmadıkça, kullanıcı vlan'ları için herhangi bir SVI'ya ihtiyacınız yoktur.
- Vlan create ettikten sonra SSID yayını için aşağıda yer alan Tag&Profiles konfigürasyonunu gerçekleştirmek gerekir.



İlk olarak basic konfigürasyonumuzu gerçekleştirelim.

#### Step1:

Cisco Cata	alyst 9800–CL Wi	reless Controller	Welco	ome admin 🛛 🛠 🕏 🛕 🖺 🌣	Search APs and Clients Q	<sub>*</sub> * ⊕
Q. Search Menu Items	Configuration * >	Wireless Setup * > Basic				
Dashboard	← Back				× Delete Locatio	n 🖺 Apply
Monitoring >	General Wirel	PTT AP Conven	1	AAA Separa		
	Name*			Available (0)	Selected (0)	
	Location	C Local				
C Licensing	Client Density	Low Typical High	Custom	No AAA servers available	No AAA servers selected	
	Native VLAN	1		Add Nex	<u>. Server</u>	
Walk Me Through 3				ACL/URL Filters		
				+ Add × Delete		
				ACL T Web URL Name Auth Filter	Ť	

#### Step2:

Cisco Cata	Ilyst 9800-CL Wireless Controller Welcome admir	ain 🔗 🌾 🛕 🖹 🏟 🔞 🕢 🎜 Search APs and Clients 🔍	×* ⊕
Q. Search Menu Items	Configuration * > Wireless Setup * > Basic		
Dashboard	← Back	× Delete Location	Apply 6
Monitoring	General Wireless Networks AP Provisioning		
	WI ANs on this Location		
Administration	WLAN Name	VLAN/VLAN Group	
C Licensing	IPTelefon     PBT-Misafir	VLAN0009 VLAN0012	
* Troubleshooling	PBT-Personel	VLAN0006	
	H 4 1 F H 10 V Berns per page	1 - 3 of	3 items
Walk Me Through >			

Gördüğümüz gibi apply ettiğimiz zaman wireless basic configuration tamamlamış olduk.

F	cisco	Cisco C	atalys	t 9800-CL Wirel	ess Controller		W	Icome admin	* *	<b>A</b> 🗈	0 3 6	Search APs and Clients Q	<sub>4</sub> × ⊕
Q	Search Menu I	tems		Configuration * > W	ireless Setup * >	Basic							
				+ Add								Q. Search	r a Location
Ø			>	6	)								
Ľ			>	PTT_AP	_Group								
ŝ			•	PTT_AP	_Group								
C				0 Joined APs	0 Clients								
×													
	Walk Me Throu	ph >											

# 7) SSID Yayını Yapma İşlemi

Tags & Profiles Site Policy (Optional) AP Join Profile	Radio F (Optic	Policy onal)		
I Site Policy (Optional) AP Join Profile	Radio F (Optic	Policy onal)		
AP Join Profile		Radio Policy (Optional)		
	RF Profile			
Flex Profile	RF Tag	6		
Site Tag 🛛 🗬				
DEPLOY PHASE				
Apply to APs				
(Mandatory)				
Tag APs				
	Flex Profile Site Tag <b>P</b> DEPLOY PHASE Apply to APs (Mandatory) Tag APs and push configurat	Flex Profile RF Tag Site Tag DEPLOY PHASE Apply to APs (Mandatory) Tag APs and push configuration to them		

• İlk olarak aşağıda yer alan sekmeden 'Advance' kısmı seçilmelidir. Seçimden sonra aşağıdaki 'Advanced Wireless Setup' menüsü açılır.

Wireless Setup	Advanced
	Select Type
	Basic
	Advanced
A	Advanced Wireless Setup
	« Start
	Tags & Profiles
	WLAN Profile
	Policy Profile
	Policy Tag 🖌 🔳 🕇
	AP Join Profile
	Flex Profile
	€ Site Tag
	()RF Profile
	■ RF Tag    III
	Apply
	Tog APs
	Done

Yukarıdaki menüde yer alan bütün sekmelere sırasıyla konfigürasyon yapacağız. Aşağıdaki adımları takip edelim.

Step 1

General	Security	Adva	anced
Profile Name*	9800-PSK-Central	Radio Policy	All
SSID	9800-PSK-Central	Broadcast SSID	
WLAN ID*	1		
Status	ENABLED		



#### Step 2



Policy Profile – General Tab

General	Access Policies	QOS and AVC	Mobility	Adv	anced
WLAN Local Profili	ing			WLAN ACL	
ITTP TLV Caching				IPv4 ACL	Search or Select
ADIUS Profiling				IPv6 ACL	Search or Select
HCP TLV Caching				URL Filters	
ocal Subscriber Po	licy Name	Search or Select		Pre Auth	Search or Select
/LAN				Post Auth	Search or Select
'LAN/VLAN Group		LAB-WIRELESS-USE ¥			
/ulticast VLAN		Enter Multicast VLAN			
Client Fuel		Policy Profile – Access	s Policies Tab		
(sec)	ision Timeout	86400	Hotspot Server	Search or S	Select 👻
Guest LAN Timeout	sion Timeout	86400	Hotspot Server	Search or S	Select V
Guest LAN Timeout	Ision Timeout	86400	Hotspot Server User Defined ( Status	Search or S	Select V
Guest LAN Timeout DHCP DHCP Servi	Ision Timeout	86400	Hotspot Server User Defined ( Status Drop Unicast DNS Layer Sec	Search or S Private) Networ	select v
Guest LAN Timeout DHCP IPv4 DHCP DHCP Serv Address Show more >	Ision Timeout 2 Session Required er IP 10	86400 0.1.2.100	Hotspot Server User Defined ( Status Drop Unicast DNS Layer Sec DNS Layer Parameter Map	Private) Networ	K K ured V Clear
Guest LAN Timeout DHCP IPv4 DHCP DHCP Serv Address Show more >	Ision Timeout	86400 D.1.2.100	Hotspot Server User Defined ( Status Drop Unicast DNS Layer Sec DNS Layer Parameter Map Flex DHCP Option for DNS	Private) Networ	select v k ured v Clear
Guest LAN Timeout DHCP IPv4 DHCP DHCP Serv Address Show more > AAA Polic Allow AAA	Ision Timeout 2 Session Required 2 er IP 10 >> y Override	86400 D.1.2.100	Hotspot Server User Defined ( Status Drop Unicast DNS Layer Sec DNS Layer Security Parameter Map Flex DHCP Option for DNS Flex DNS Fraffic Redirect	Search or S Private) Networ  Curity  ENABLED  IGNORE	Select V K ured V Clear
Guest LAN Timeout DHCP IPv4 DHCP DHCP Serv Address Show more >: AAA Polic Allow AAA	Ision Timeout 2 Session Required 2 er IP 10 S> y Override Cverride	86400 D.1.2.100	Hotspot Server User Defined ( Status Drop Unicast DNS Layer Sec DNS Layer Sec Security Parameter Map Flex DHCP Option for DNS Flex DNS Traffic Redirect WLAN Flex Po	Search or S Private) Networ  Private) Networ  Curity  Not Configu  ENABLED  IGNORE	k ured v Clear
Guest LAN Timeout DHCP IPv4 DHCP DHCP Serv Address Show more > AAA Polic Allow AAA NAC State Policy Nam	Ision Timeout ?	86400 D.1.2.100	Hotspot Server User Defined ( Status Drop Unicast DNS Layer Sec DNS Layer Security Parameter Map Flex DHCP Option for DNS Flex DNS Flex DNS Fraffic Redirect WLAN Flex Po VLAN Central S	Search or S  Private) Networ  Curity  Not Configu  ENABLED  IGNORE  licy  witchin	select v k ured v Clear

A Changes ma	result in loss of connectivity for some clients that are assoc	ciated to APs with this Policy Tag.
Name*	LAB-Policy-Tag-Centra	
Description	Enter Description	
+ Add × Del	Yolicy Profile	
9800-PSK-Central	LAB-Policy-Profile-Central	
a a 1 ⊨ ⊨	10 🔻 items per page	1 - 1 of 1 items
ap WLAN and Pol	су	
WLAN Profile*	9800-PSK-Central   Policy Profile*	LAB-Policy-Profile-C 🔹

Policy Tag



#### Step 5

-	Add × Delete		
	Flex Profile Name	▼ Description	T
	default-flex-profile	default flex profile	
14	<ul><li>&lt; 1 ▶ №</li><li>10</li></ul>	▼ items per page	1 - 1 of 1 items

Edit Flex Profile						×
General	Local Authenticati	on Policy ACL	VLAN	DNS Layer Security		,
Name* Description Native VLAN ID HTTP-Proxy IP A CTS Polley Inline Tagging SGACL Enforcem CTS Profile Name	erri Entre didress 0.0 o del	AP_Group Ir Description Ir Description 0.0 fault-sxp-profile K		Fallback Radio Shut Flax Resilient ARP Caching Efficient Image Upgrade OfficeExtend AP Join Minimum Latency IP Overlap mDNS Flex Profile	C C C Search or Select v	
Cancel					E	Update & Apply to Device
tit Flex Profile		Deley (C	10.00	DNG Low Consti		
		1 - 3 07	ः स्टार्थ			
D Cancel						Update & Apply to Device
cisco Cisco	Catalyst 9800-CL	Wireless Controller		Welcome admin	* 4 8 4 8 9 2	Search APs and Clients Q
Search Menu Items Dashboard	Configuration *	> Tags & Profiles * > File × Deters	BX			
	PIT_AP_G	i Name		T Description		
Configuration Administration Licensing Troubleshooting	detaut-file	-grofile → H 10 ★ Rems par	r page	default flex profile		1-2d21
mark Me Through (						

Edit Site Tag			
Name*	LAB-Site-Tag-Central		
Description	Enter Description		
AP Join Profile	AP-Join-Profile-Cen 🔻		
Control Plane Name	•		
Enable Local Site			

Site Tag configuration



Step 9

Step 8

	ed Number of APs	:: 1			
	AP Name 🔍	AP Model 🗸	AP MAC	AP Mode	<ul> <li>Admin Status</li> </ul>
	LAB-AP-3702- FL0	AIR-CAP3702I- E-K9	d8b1.903b.84f0	) Local	Enabled
1-4	⊲ 1 ⊳	10 👻 items per			
	Tag APs				,
	Tags				
	Policy	LAB-Policy-Tag	g-Cer 👻		
	Site	LAB-Site-Tag-	Centr 🔻		
	RF	LAB-RF-Tag	•		
		-			

• Kontrol sağladığımızda bir yayının geldiğini görmeliyiz.

# 8) FAYDALANILABİLECEK KAYNAKLAR

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