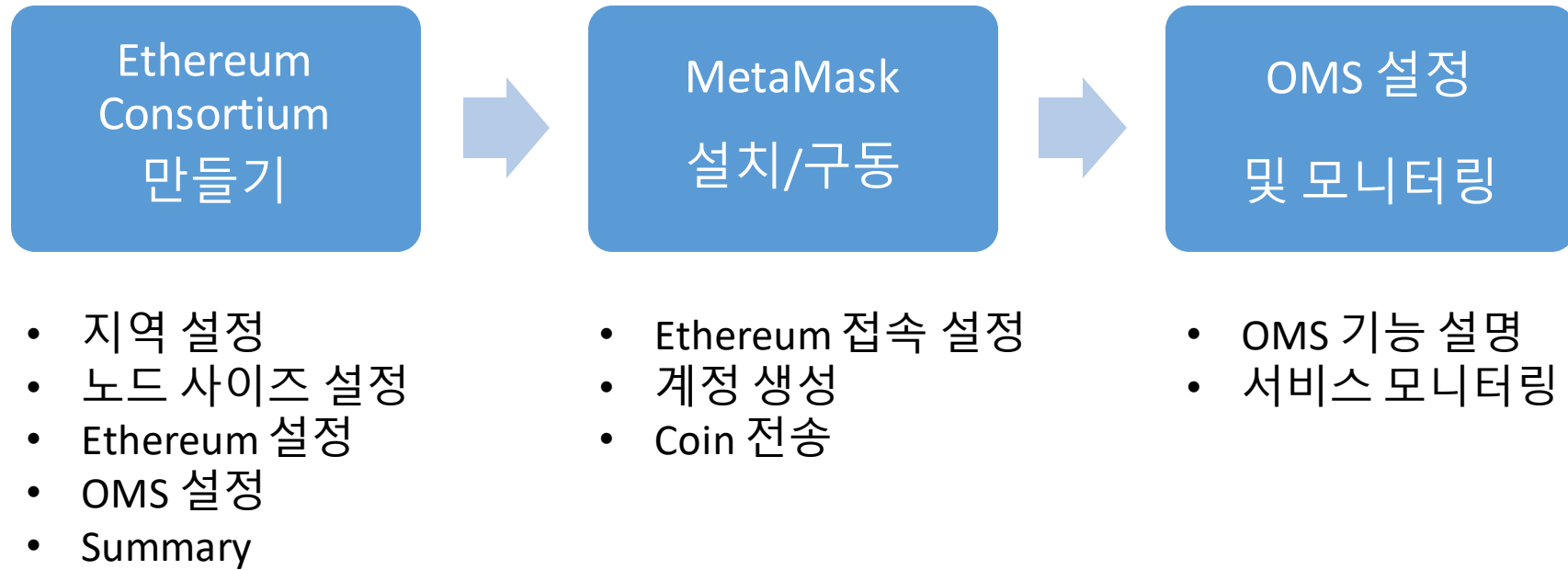




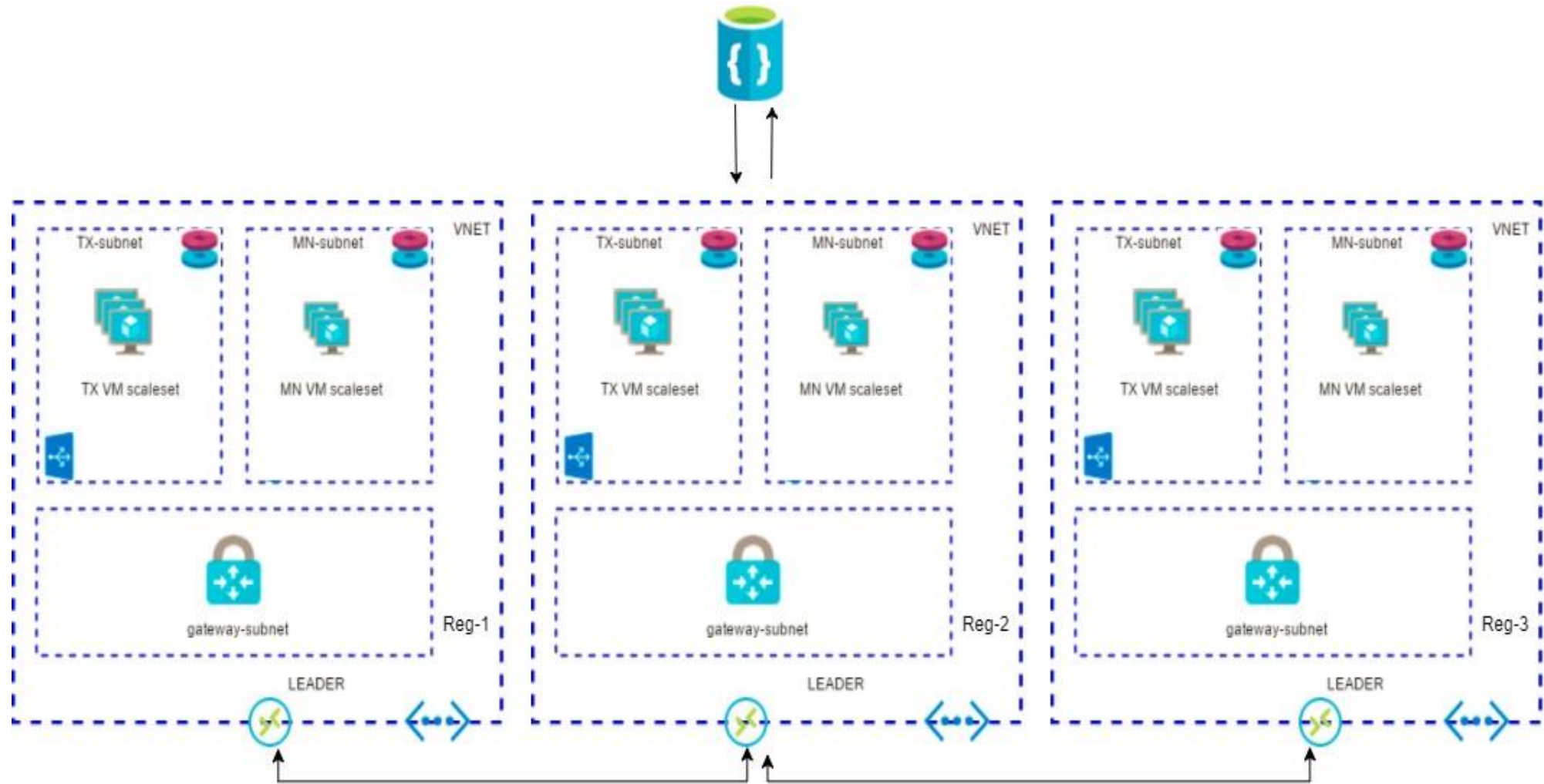
# Ethereum Consortium 구축

2miles 윤혜식

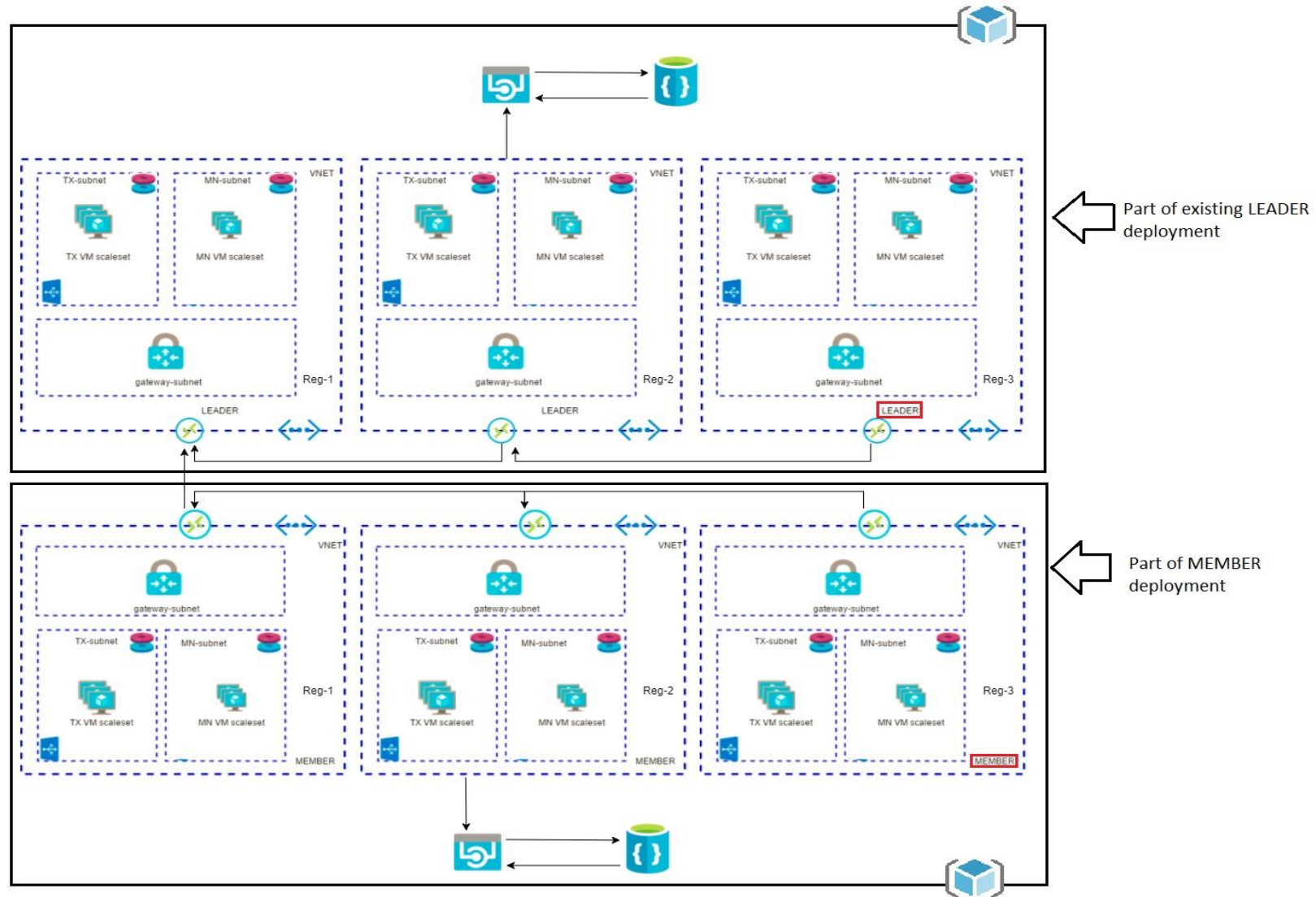
# 실습 내용



# Standalone and Consortium Leader Overview



# Joining Consortium Member Overview



# Azure Portal 에서 Ethereum Proof-of-Work Consortium 선택

Azure Portal 에서 “리소스 만들기 ” 선택 후 “Ethereum” 으로 검색  
검색 결과에서 “Etereum Proof-of-Work Consortium” 선택

The screenshot shows the Azure Portal interface. On the left, the '리소스 만들기' (Create Resource) button is highlighted with a red dashed box. The main area shows the 'Marketplace' with a search bar containing 'ethereum', also highlighted with a red dashed box. Below the search bar, the results are displayed in a table. The 'Ethereum Proof-of-Work Consortium' entry is highlighted with a red dashed box.

이름	게시자	범주
Ethereum Consortium Blockchain (Deprecated)	Microsoft	계산
Ethereum Consortium Leader (Deprecated)	Microsoft	계산
Ethereum Studio	ether.camp	계산
Ethereum Proof-of-Work Consortium	Microsoft	계산

# Azure Portal에서 Ethereum Proof-of-Work Consortium 구축

Ethereum Proof-of-Work Con... X

기본 사항 X

1 기본 사항  
기본 설정 구성 >

2 Deployment regions  
Required >

3 Network size and performance  
Define the number and size a... >

4 Ethereum Settings  
Configure the Ethereum nodes >

5 Operations Management Suite  
Create new or connect to exi... >

6 요약  
Ethereum Proof-of-Work Con... >

7 구입 >

\* Create a new network or join existing network? ⓘ  
Create new Join existing

Deploy a network that will be part of a consortium? ⓘ  
Standalone Consortium

\* Resource prefix ⓘ  
dev ✓

\* VM user name ⓘ  
david ✓

\* Authentication type ⓘ  
암호 SSH 공개 키

\* Password ⓘ  
●●●●●●●●●● ✓

\* Confirm password  
●●●●●●●●●● ✓

구독  
Visual Studio Enterprise: BizSpark ▾

\* 리소스 그룹 ⓘ  
☒ 새로 만들기 ☐ 기존 그룹 사용  
EthereumDemo ✓

\* 위치  
아시아 남동부 ▾

Parameter Name	Description	Allowed Values	Default Values
Create a new network or join existing network?	Create a new network or join a preexisting consortium network	Create New Join Existing	Create New
Deploy a network that will be part of a consortium?	A consortium network allows future deployments to join this network (visible when "Create New" is selected above)	Standalone Consortium	Standalone
Resource Prefix	String used as a base for naming resources (2 to 4 alphanumeric characters). A unique hash is prepended to the string for some resources, while resource-specific information is appended.	Alphanumeric characters with length 2 to 4	NA
VM user name	Administrator username of each deployed VM (alphanumeric characters only)	1-64 characters	gethadmin
Authentication type	The method to authenticate to the virtual machine.	Password or SSH public key	Password
Password (Authentication type = Password)	The password for the administrator account for each of the virtual machines deployed. The password must contain 3 of the following: 1 upper case character, 1 lower case character, 1 number, and 1 special character. While all VMs initially have the same password, you can change the password after provisioning.	12 -72 characters	NA
SSH Key (Authentication type = Public Key)	The secure shell key used for remote login.		NA
Subscription	The subscription to which to deploy the consortium network		NA
Resource Group	The resource group to which to deploy the consortium network.		NA
Location	The Azure region for resource group.		NA

# Ethereum PoW Consortium – 지역 설정

Ethereum Proof-of-Work Con... X

1 기본 사항 완료 ✓

2 Deployment regions Required >

3 Network size and performance Define the number and size a... >

4 Ethereum Settings Configure the Ethereum nodes >

5 Operations Management Suite Create new or connect to exi... >

6 요약 Ethereum Proof-of-Work Con... >

7 구입 >

Deployment regions □ X

Number of region(s) ⓘ  
1 ▾

\* First region ⓘ  
Southeast Asia ▾

Parameter Name	Description	Allowed Values	Default Values
Number of mining nodes	The number of mining nodes deployed per region	2-15	2
Mining node storage performance	The type of managed disk backing each of the deployed mining nodes.	Standard or Premium	Standard
Mining node virtual machine size	The virtual machine size used for mining nodes.	Standard A, Standard D, Standard D-v2, Standard F series, Standard DS, and Standard FS	Standard D1 v2
Number of load balanced transaction nodes	The number of transaction nodes to provision as part of the network.	1-5	2
Transaction node storage performance	The type of managed disk backing each of the deployed transaction nodes.	Standard or Premium	Standard
Transaction node virtual machine size	The virtual machine size used for transaction nodes.	Standard A, Standard D, Standard D-v2, Standard F series, Standard DS, and Standard FS	Standard D1 v2

# Ethereum PoW Consortium – 노드 사이즈 선택

Ethereum Proof-of-Work Con... X

1 기본 사항 완료 ✓

2 Deployment regions Done ✓

3 Network size and performance Define the number and size a... >

4 Ethereum Settings Configure the Ethereum nodes >

5 Operations Management Suite Create new or connect to exi... >

6 요약 Ethereum Proof-of-Work Con... >

7 구입 >

Network Size and Perform... □ X

Mining Nodes

Number of mining nodes ⓘ  
2 ▾

\* Mining node storage performance ⓘ  
Standard Premium

\* Mining node virtual machine size >  
2x 표준 D1 v2

Transaction Nodes

Number of load balanced transaction nodes ⓘ  
1 ▾

\* Transaction node storage performance ⓘ  
Standard Premium

\* Transaction node virtual machine size >  
1x 표준 D1 v2

Parameter Name	Description	Allowed Values	Default Values
Number of mining nodes	The number of mining nodes deployed per region	2-15	2
Mining node storage performance	The type of managed disk backing each of the deployed mining nodes.	Standard or Premium	Standard
Mining node virtual machine size	The virtual machine size used for mining nodes.	Standard A, Standard D, Standard D-v2, Standard F series, Standard DS, and Standard FS	Standard D1 v2
Number of load balanced transaction nodes	The number of transaction nodes to provision as part of the network.	1-5	2
Transaction node storage performance	The type of managed disk backing each of the deployed transaction nodes.	Standard or Premium	Standard
Transaction node virtual machine size	The virtual machine size used for transaction nodes.	Standard A, Standard D, Standard D-v2, Standard F series, Standard DS, and Standard FS	Standard D1 v2



# Ethereum PoW Consortium – Ethereum 설정 (Standalone 인 경우)

Ethereum Proof-of-Work Con... X

1 기본 사항 완료 ✓

2 Deployment regions Done ✓

3 Network size and performance Done ✓

4 Ethereum Settings Configure the Ethereum nodes >

5 Operations Management Suite Create new or connect to exi... >

6 요약 Ethereum Proof-of-Work Con... >

7 구입 >

Ethereum Settings □ X

\* Consortium Member Id ⓘ  
100 ✓

\* Network ID ⓘ  
10101010

\* Advanced: Custom Genesis Block ⓘ  

Yes No

\* Ethereum account password ⓘ  
●●●●●●●●●●●●●●●● ✓

\* Confirm password  
●●●●●●●●●●●●●●●● ✓

\* Ethereum private key passphrase ⓘ  
●●●●●●●●●●●●●●●● ✓

\* Confirm passphrase  
●●●●●●●●●●●●●●●● ✓

Parameter Name	Description	Allowed Values	Default Values
Consortium Member ID	<p>The ID associated with each member participating in the consortium network used to configure IP address spaces to avoid collision.</p> <p>Member ID should be unique across different organizations in the same network. A unique member ID is needed even when the same organization deploys to multiple regions.</p> <p>Make note of the value of this parameter since you will need to share it with other joining members.</p>	0-255	
Ethereum Network ID	<p>The network ID for the consortium Ethereum network being deployed. Each Ethereum network has its own Network ID, with 1 being the ID for the public network. While we have restricted network access for mining nodes, we still recommend using a large number to prevent collisions.</p>	5 - 999,999,999	10101010
Custom genesis block	Option to either automatically generate a genesis block or provide a custom one.	Yes/No	No
Ethereum Account Password (Custom genesis block = No)	<p>The administrator password used to secure the Ethereum account imported into each node.</p> <p>The password must contain the following: 1 upper case character, 1 lower case character, and 1 number.</p>	12 or more characters	NA
Ethereum private key passphrase (Custom genesis block = No)	The passphrase used to generate the ECC private key associated with the default Ethereum account that is generated. A pre-generated private key does not need to be explicitly passed in.	12 or more characters	NA

# Ethereum PoW Consortium – Ethereum 설정 (Join Member 인 경우)

Ethereum Settings

\*

Consortium Member Id ⓘ

\*

Ethereum account password ⓘ

\*

Confirm password

\*

Ethereum private key passphrase ⓘ

\*

Confirm passphrase

\*

Shared Key for Connection ⓘ

\*

Consortium Data Url ⓘ

VNet Gateway to Connect to ⓘ

Endpoint of Peer information registrar ⓘ

Key of Peer information registrar ⓘ

OK

Genesis block (Custom genesis block = Yes)	<p>JSON string representing custom genesis block. You can find more details on the format of the genesis block here, under Custom Networks.</p> <p>An Ethereum account is still created when providing a custom genesis block. You should still consider specifying a prefunded Ethereum account in the genesis block to not wait for mining.</p>	Valid JSON	NA
Shared Key for Connection	A Shared key for connection between VNET gateways.	12 or more characters	NA
Consortium Data URL	<p>The URL pointing to the relevant consortium configuration data provided by another member's deployment.</p> <p>This information is provided by an already connected member who has a deployment. If you deployed the rest of the network, the URL is the template deployment output, named CONSORTIUM-DATA.</p>		NA
VNet Gateway to Connect to	<p>The resource path of the VNet Gateway to which to connect. This information is provided by an already connected member who has a deployment. If you deployed the rest of the network, the URL is in template deployment output, named CONSORTIUM_MEMBER_GATEWAY_ID.</p> <p>Note: The same member's consortium data URL and VNet Gateway resource must be used.</p>		NA
Endpoint of Peer information registrar	Peer info endpoint provided by another member's deployment	Valid endpoint of first member in consortium	NA
Key of Peer information registrar	Peer info primary key provided by another member's deployment	Valid primary key of first member in consortium	NA

# Ethereum PoW Consortium – OMS(모니터링 솔루션) 설정

Ethereum Proof-of-Work Con... X

1 기본 사항 완료

2 Deployment regions Done

3 Network size and performance Define the number and size a...

4 Ethereum Settings Done

5 Operations Management Suite Create new or connect to exi...

6 요약 Ethereum Proof-of-Work Con...

7 구입

OMS

\* Connect to existing OMS (Operations Management Suite) instance? ⓘ

Create new Join existing

\* OMS Workspace Location

Southeast Asia

\* OMS Service Tier

Free

Parameter Name	Description	Allowed Values	Default Values
Connect to existing OMS	Create a new Log Analytics instance or join an existing instance	Create new Join existing	Create new
Log Analytics Location	The region where the new Log Analytics will be deployed (Visible if "Create new" is selected)		
Existing OMS Workspace Id	Workspace ID of the existing instance (Visible if "Join Existing" is selected)		
OMS Service Tier	Choose the pricing tier for the new instance. More Info at <a href="https://azure.microsoft.com/en-us/pricing/details/loganalytics/">https://azure.microsoft.com/en-us/pricing/details/loganalytics/</a> (Visible if "Join Existing" is selected)	Free Standalone Per Node	Free
Existing OMS Primary Key	The primary key used to connect to the existing OMS instance (Visible if "Join Existing" is selected)		

참고)

OMS

\* Connect to existing OMS (Operations Management Suite) instance? ⓘ

Create new Join existing

Existing OMS Workspace Id ⓘ

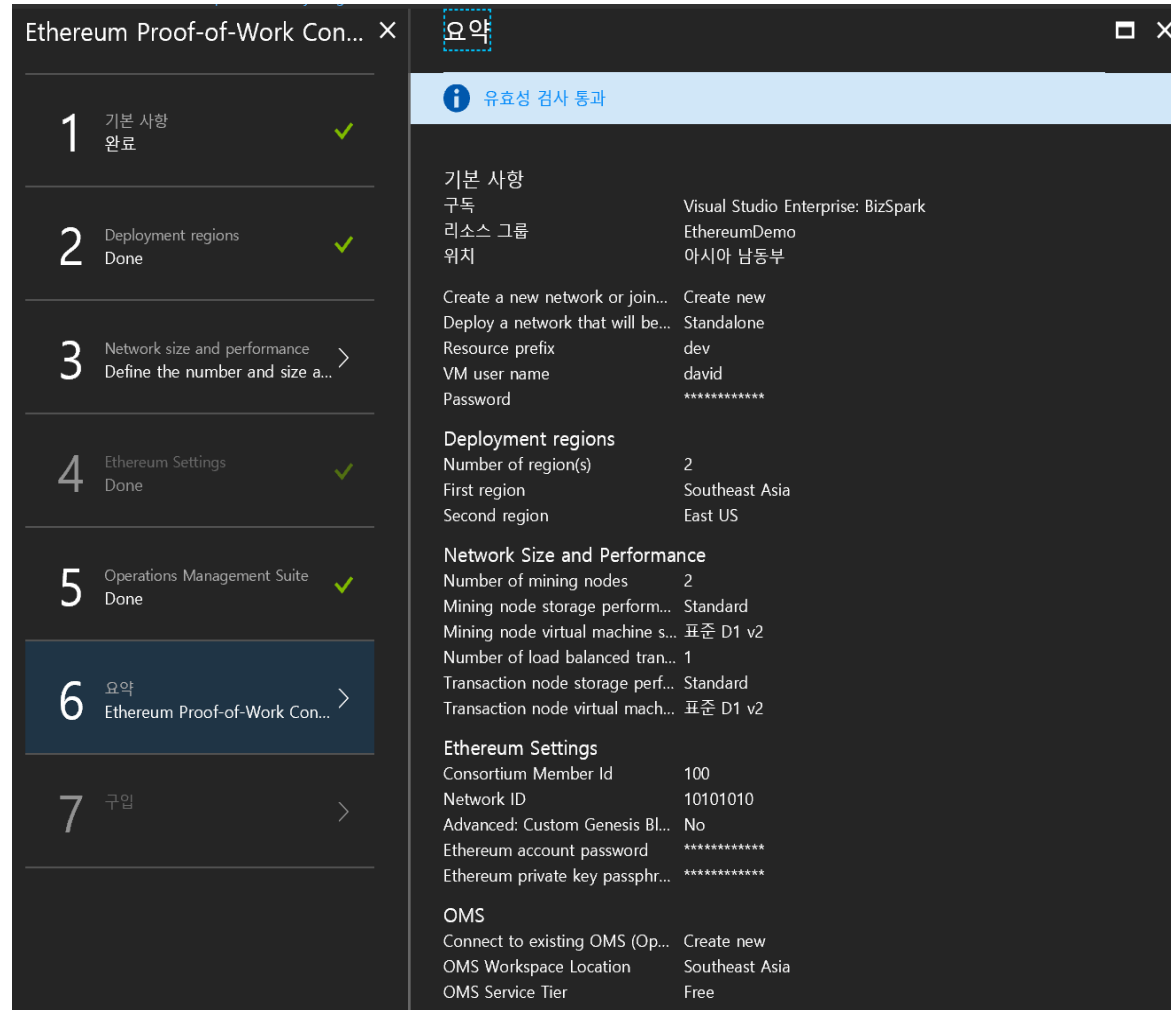
1ee2e3dd-26a2-43a0-b8c4-ea3d3b85d64c

Existing OMS Primary Key ⓘ

zNCaBaGL2qDV0Jm35xf+tE0ouS2BS5M9g==

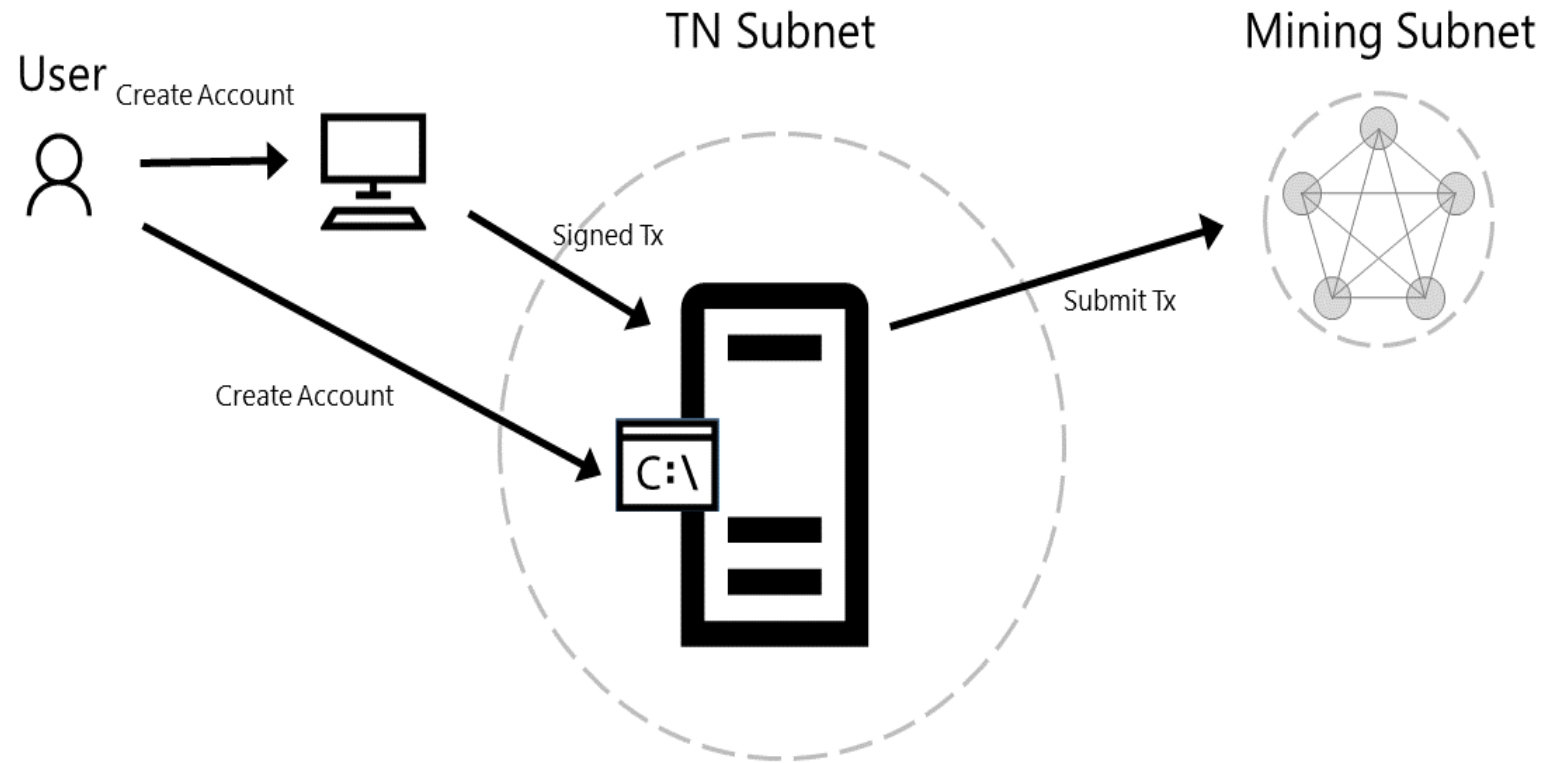
기존 OMS에 연결하는 경우 Workspace ID와 Primary Key 값을 등록

# Ethereum PoW Consortium – OMS(모니터링 솔루션) 설정



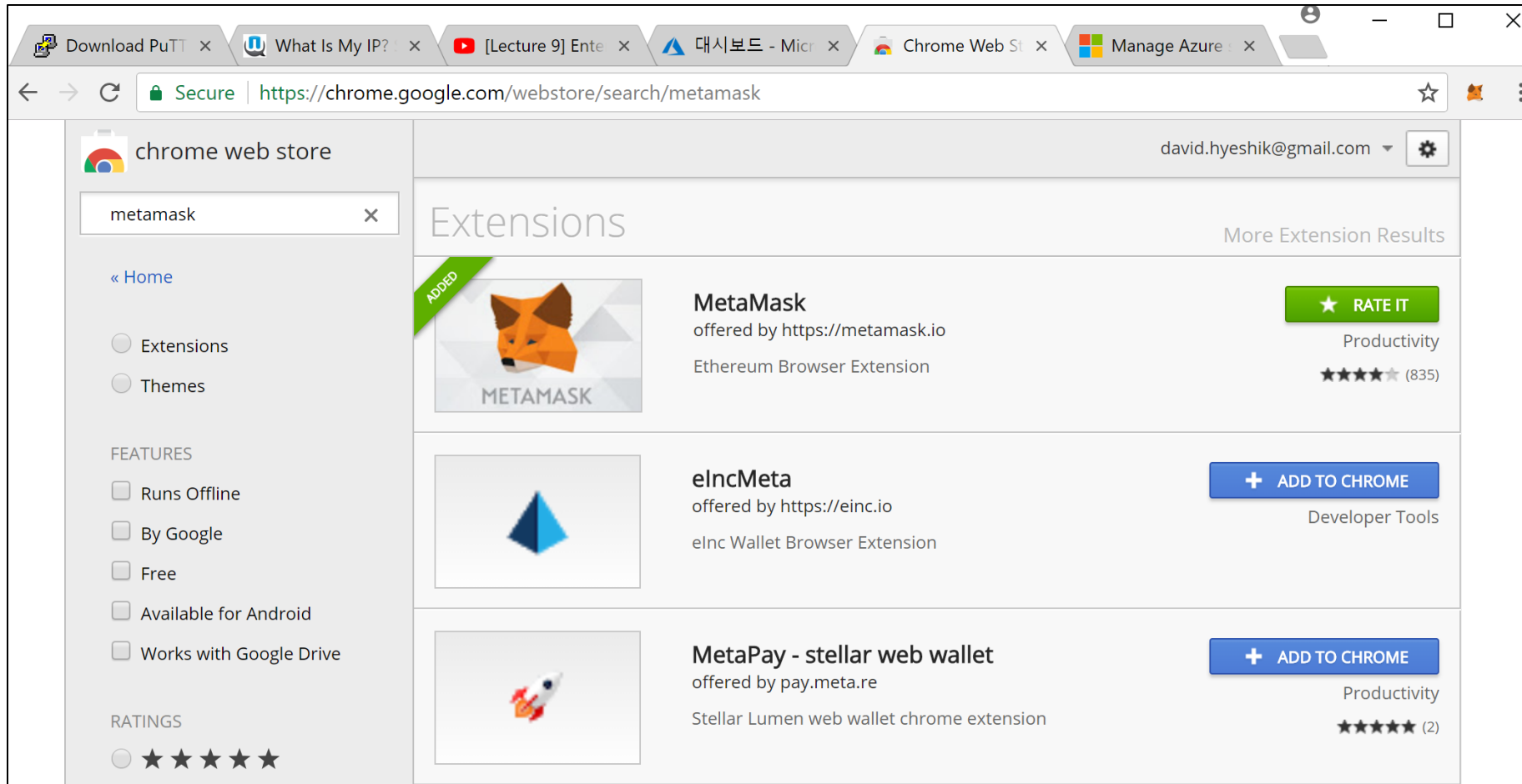
- 설치 전에 설정값 전체적으로 확인
- Region / VM Type 등 확인 필요

# Ethereum 계정 생성



# Chrome Web store에서 MetaMask 설치

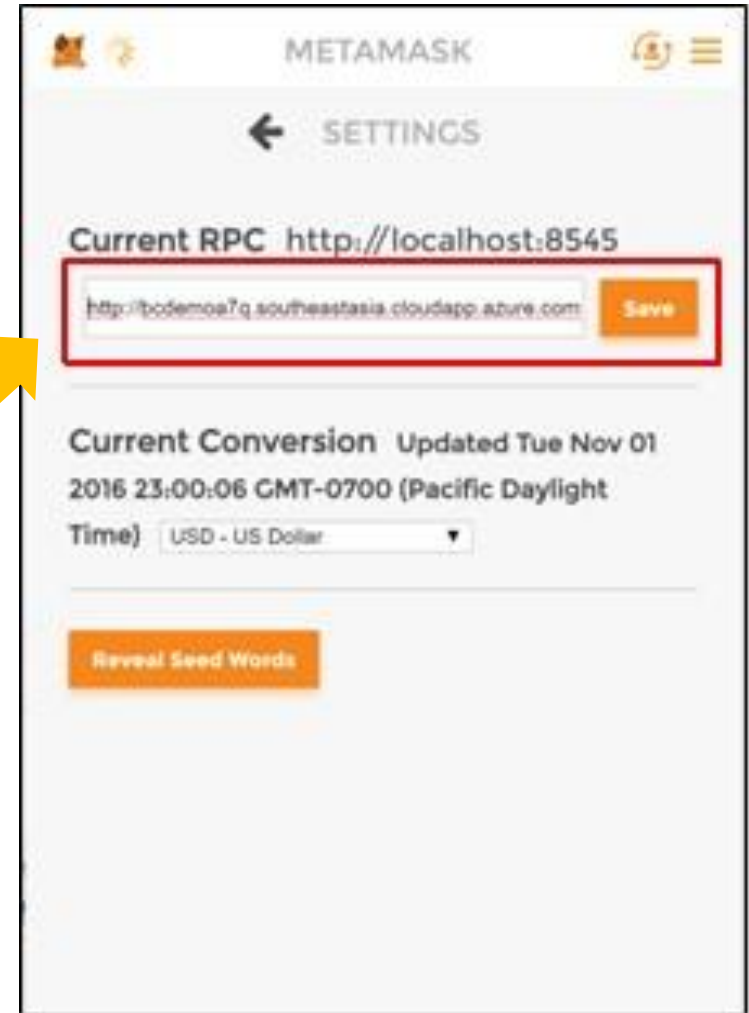
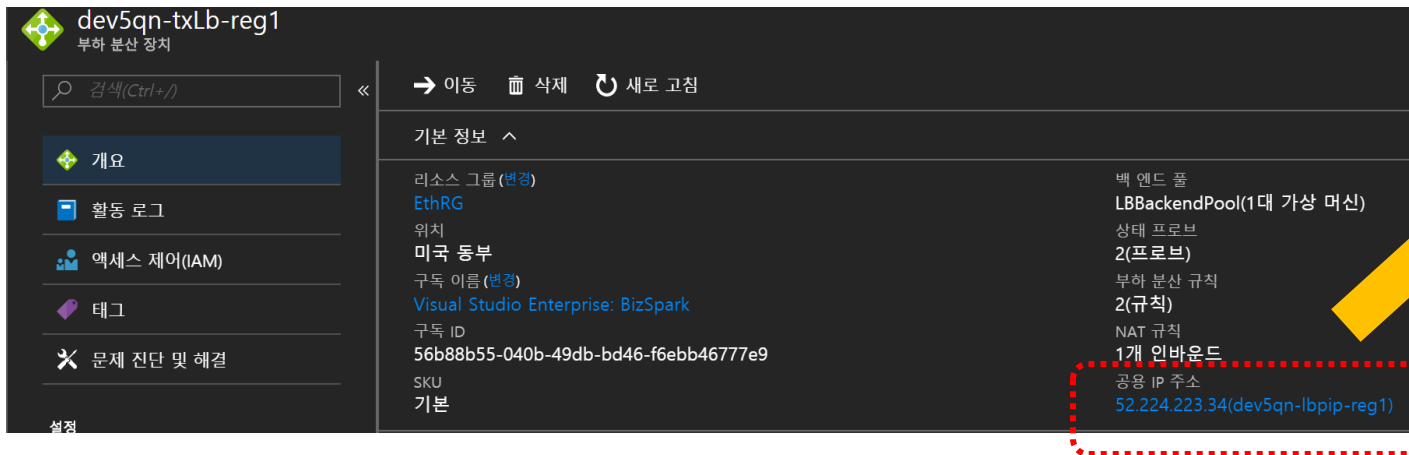
URL - <https://chrome.google.com/webstore/search/metamask>



# MetaMask 에서 Ethereum 접속

Ethereum 접속을 위한 IP확인

- Load Balancer의 IP 주소가 Ethereum 네트워크의 접속 주소

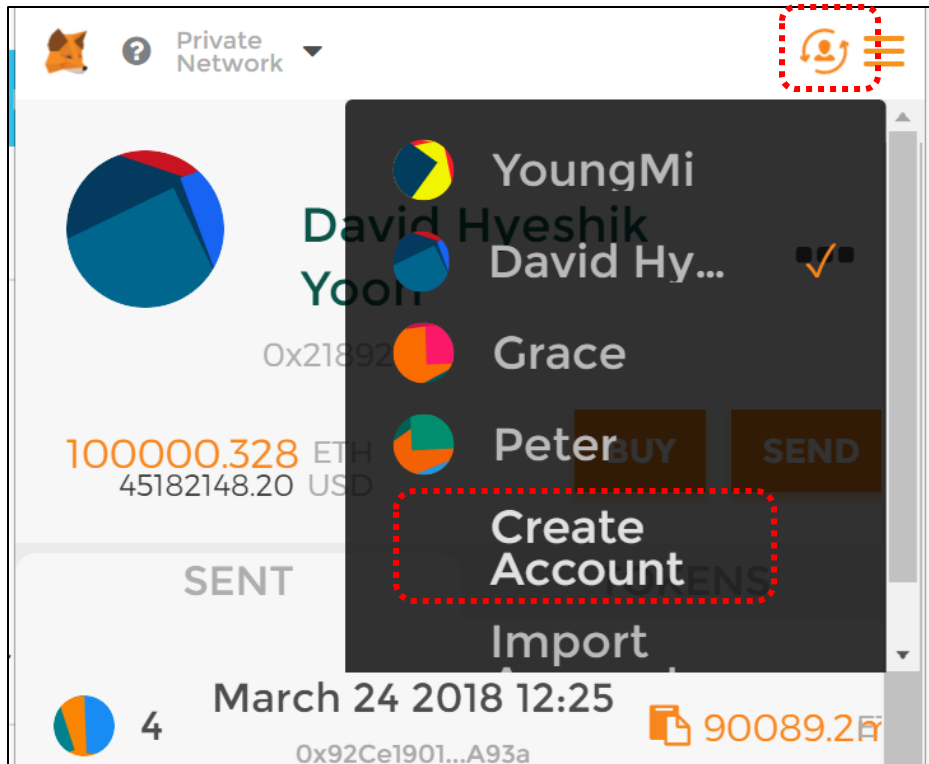


MetaMask에서 Ethereum 접속 URL 등록

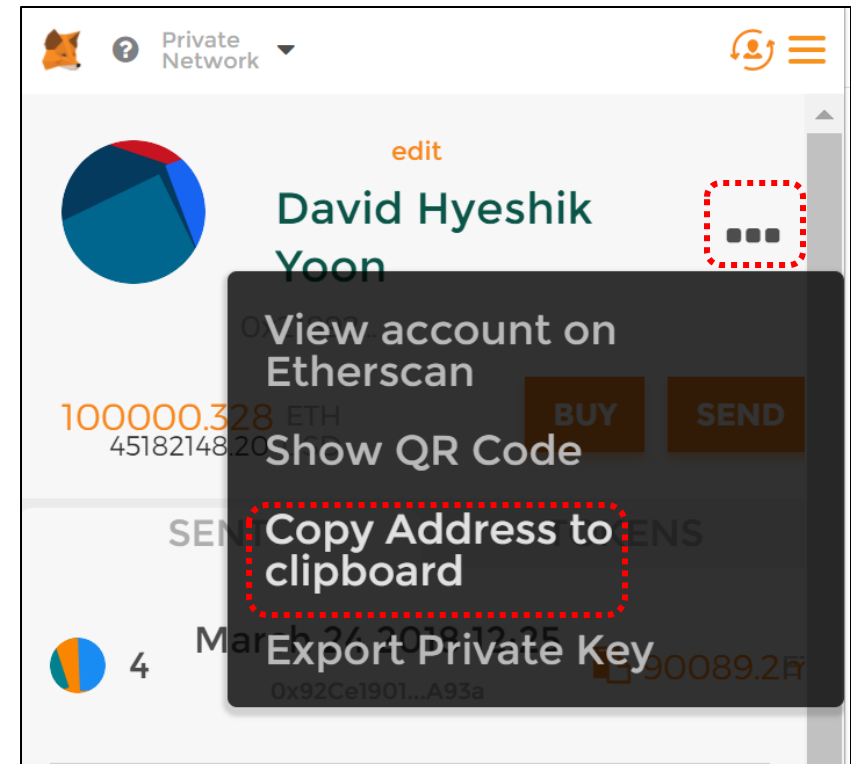
- Load Balancer의 IP 주소의 8545 포트가 접속 URL

# Ethereum 계정 생성 및 Wallet 주소 확인

MetaMask 우측 상단 사람모양 아이콘 클릭 후  
“Create Account” 통해서 계정 생성



Wallet 주소를 클립보드로 복사(확인)





# Ethereum 초기 전송

신규 생성한 계정으로 Ethereum 전송

## Bootstrap New Address with Ether

Use this function to send Ether from the predefined account to a new address

Address of Recipient


0x2e9558caD540d6aC92bF92d43B1bDA523CB2D788



Amount

1000

SUBMIT

전송 완료후 확인

 Private Network

 **Account 5** 

Ox2e955...

1000.000 ETH  
453140.00 USD

BUY

SEND




SENT



TOKENS

No transaction history.

# Ethereum 계정간 Coin 전송


신규 생성한 계정으로 Ethereum 전송

 ? Private Network  

**Account 5**  
0x2e9558ca...D788  
1000.000 ETH  
453140.00 USD

SEND TRANSACTION




0x013cc875a1dc312c31624262c5dc4a96f9910816


100 



NEXT

TRANSACTION DATA (OPTIONAL)

Gas 금액 확인 후 전송

 ? Private Network  

 CONFIRM TRANSACTION

**Account 5**  
2e9558...D788  
1000.000 ETH  
453140.00 USD  >  **Account 6**  
013CC8...0816

Amount 100.000 ETH  
45314.00 USD

Gas Limit 

21000 UNITS

Gas Price 

1000 GWEI

Max Transaction Fee 0.021000 ETH  
9.52 USD

Max Total 100.021 ETH  
45323.52 USD

Data included: 0 bytes




RESET



SUBMIT

REJECT

# Ethereum 계정간 Coin 전송

## 전송 상황 확인



 ? Private Network  

**Account 5**   
Ox2e955...




1000.000 ETH  
453140.00 USD



BUY SEND

SENT TOKENS

 0 **March 27 2018 14:42**  100.0 ETH  
Ox013CC875...0816

## 전송 완료 확인

 ? Private Network  

**Account 6**   
Ox013CC...

100.000 ETH  
46156.00 USD

BUY SEND

SENT TOKENS

No transaction history.

# OMS에서 서비스 성능 모니터링

