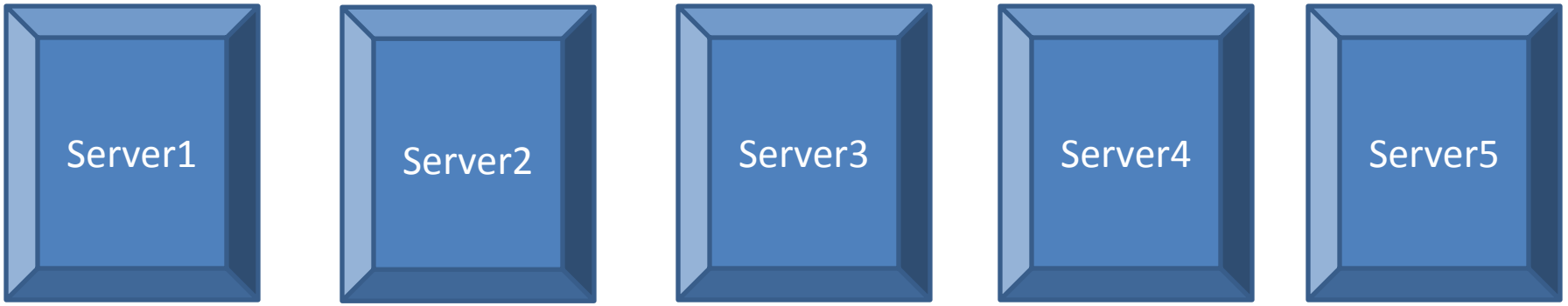
Network Load Balancing Overview

Server 2012

Network Load Balancing Cluster



The Network Load Balancing (NLB) feature distributes traffic across several servers by using the TCP/IP networking protocol

High availability

A high availability system reliably provides an acceptable level of service with minimal downtime. To provide high availability, NLB includes built-in features that can automatically:

- Detect a cluster host that fails or goes offline, and then recover.
- Balance the network load when hosts are added or removed.
- Recover and redistribute the workload within ten seconds.

Scalability

For NLB clusters, scalability is the ability to incrementally add one or more systems to an existing cluster when the overall load of the cluster exceeds its capabilities.

- Balance load requests across the NLB cluster for individual TCP/IP services.
- Support up to 32 computers in a single cluster.
- Balance multiple server load requests (from the same client or from several clients) across multiple hosts in the cluster.
- Add hosts to the NLB cluster as the load increases, without causing the cluster to fail.
- Remove hosts from the cluster when the load decreases

Hardware requirements

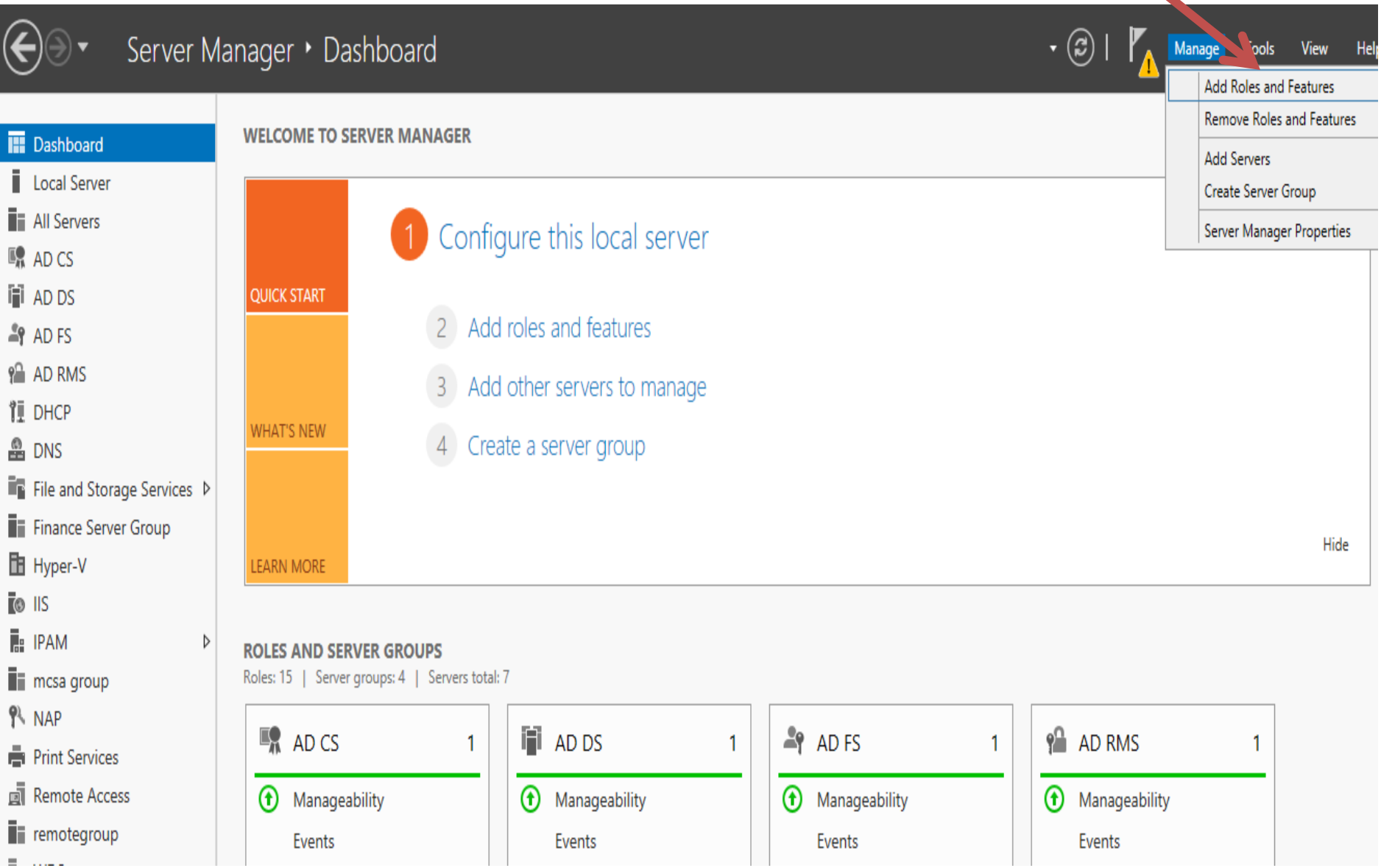
To run an NLB cluster, the following are hardware requirements:

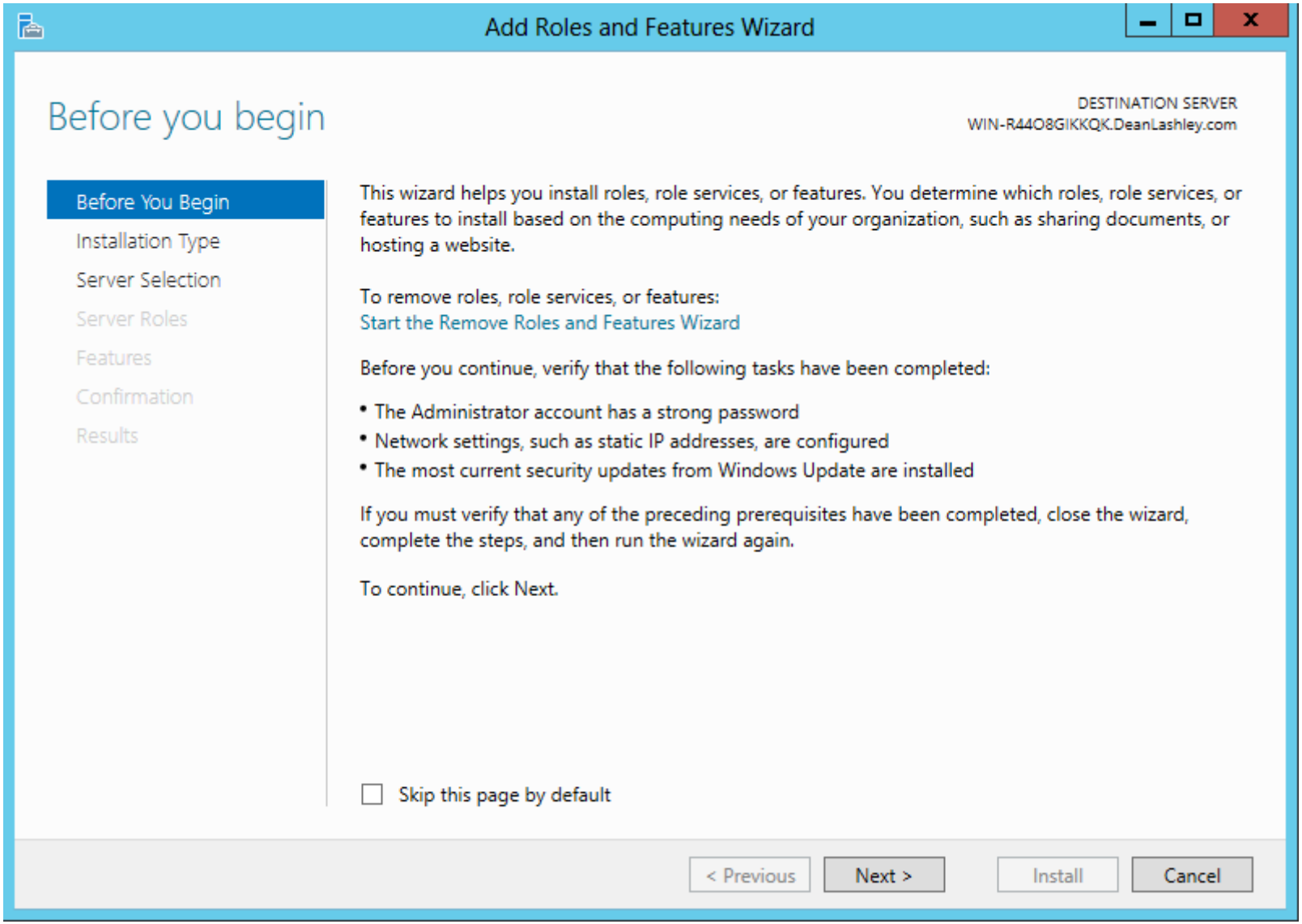
- All hosts in the cluster must reside on the same subnet.
- There is no restriction on the number of network adapters on each host, and different hosts can have a different number of adapters.
- Within each cluster, all network adapters must be either multicast or unicast. NLB does not support a mixed environment of multicast and unicast within a single cluster.

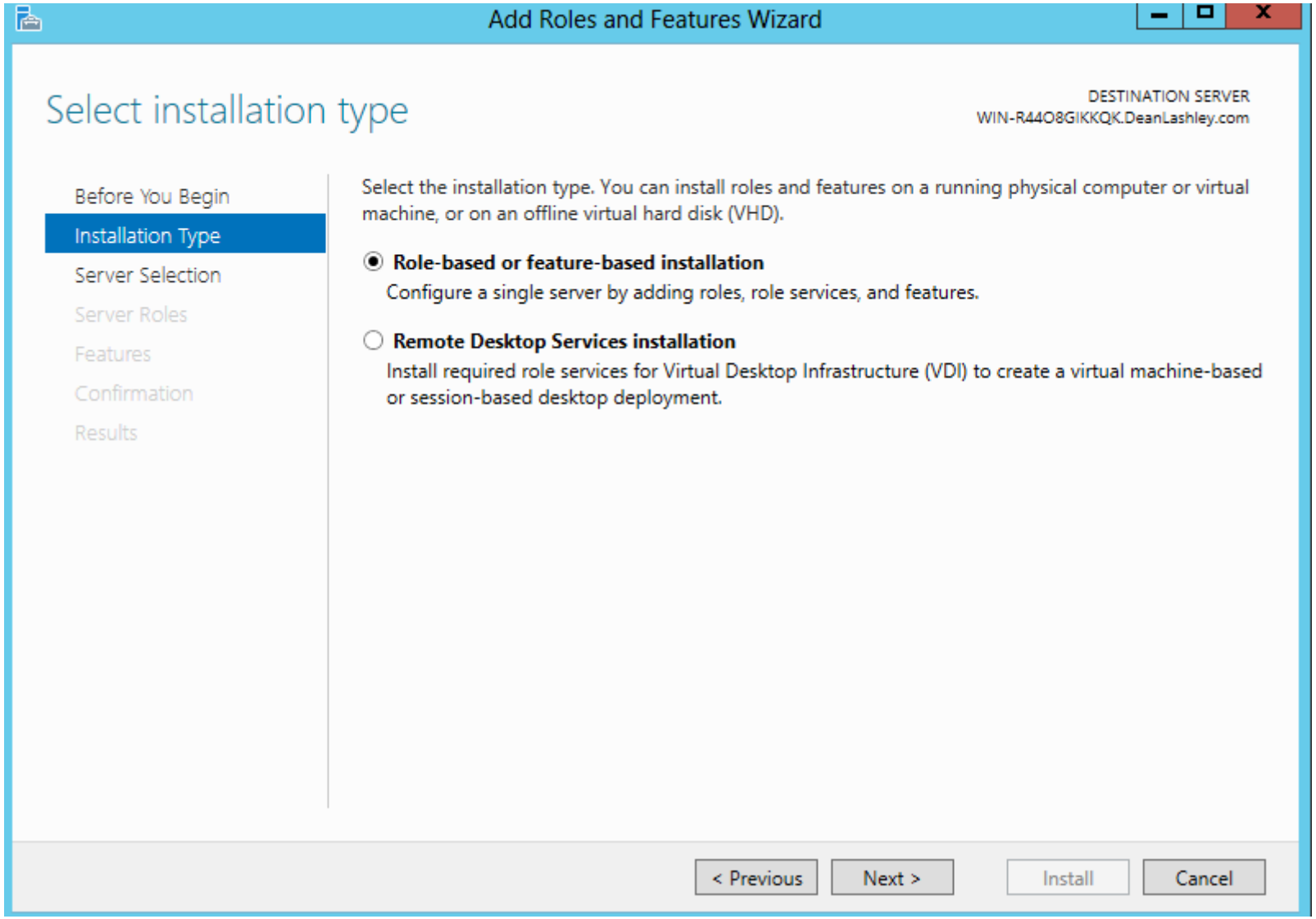
Software requirements

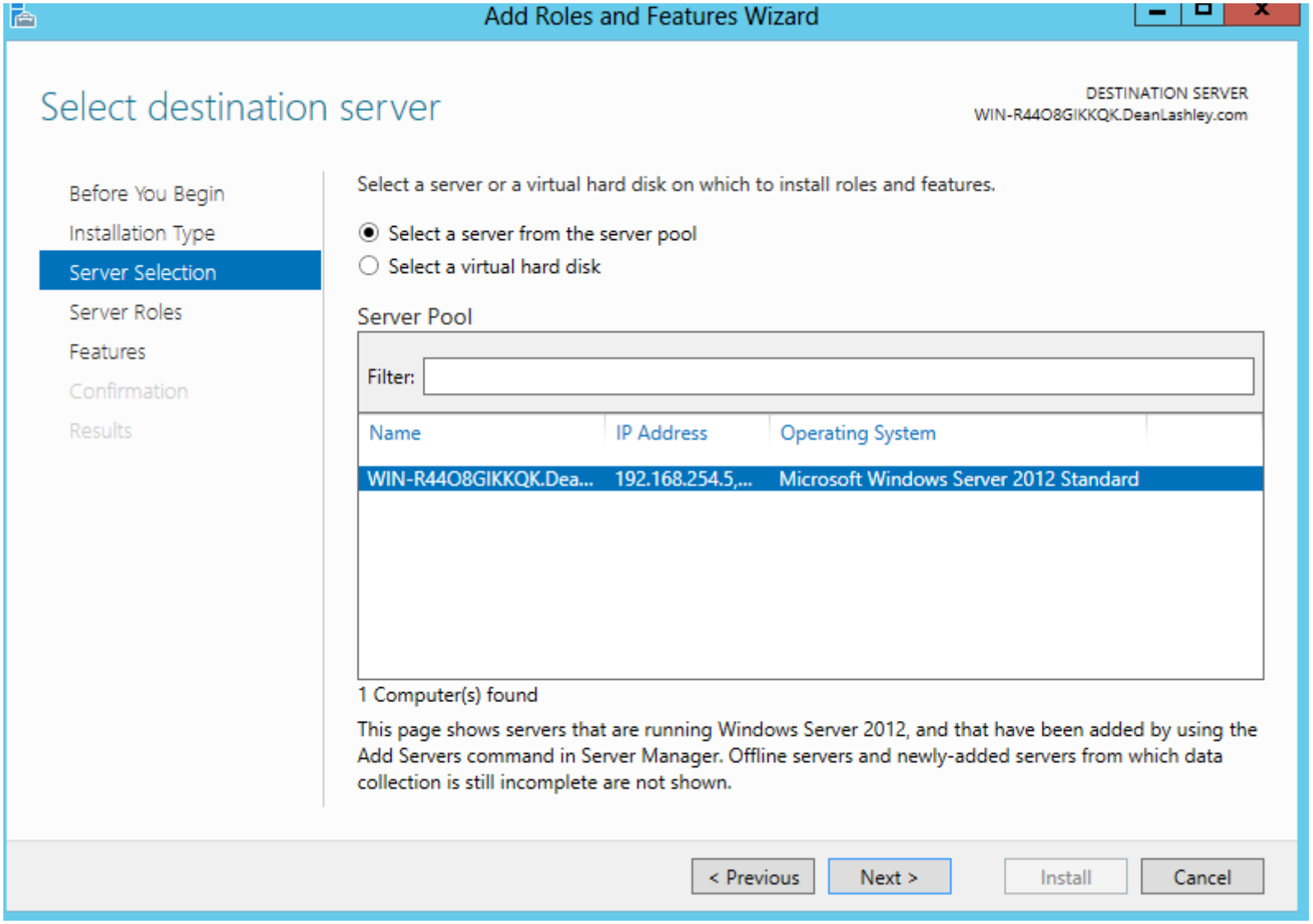
To run an NLB cluster, the following are software requirements:

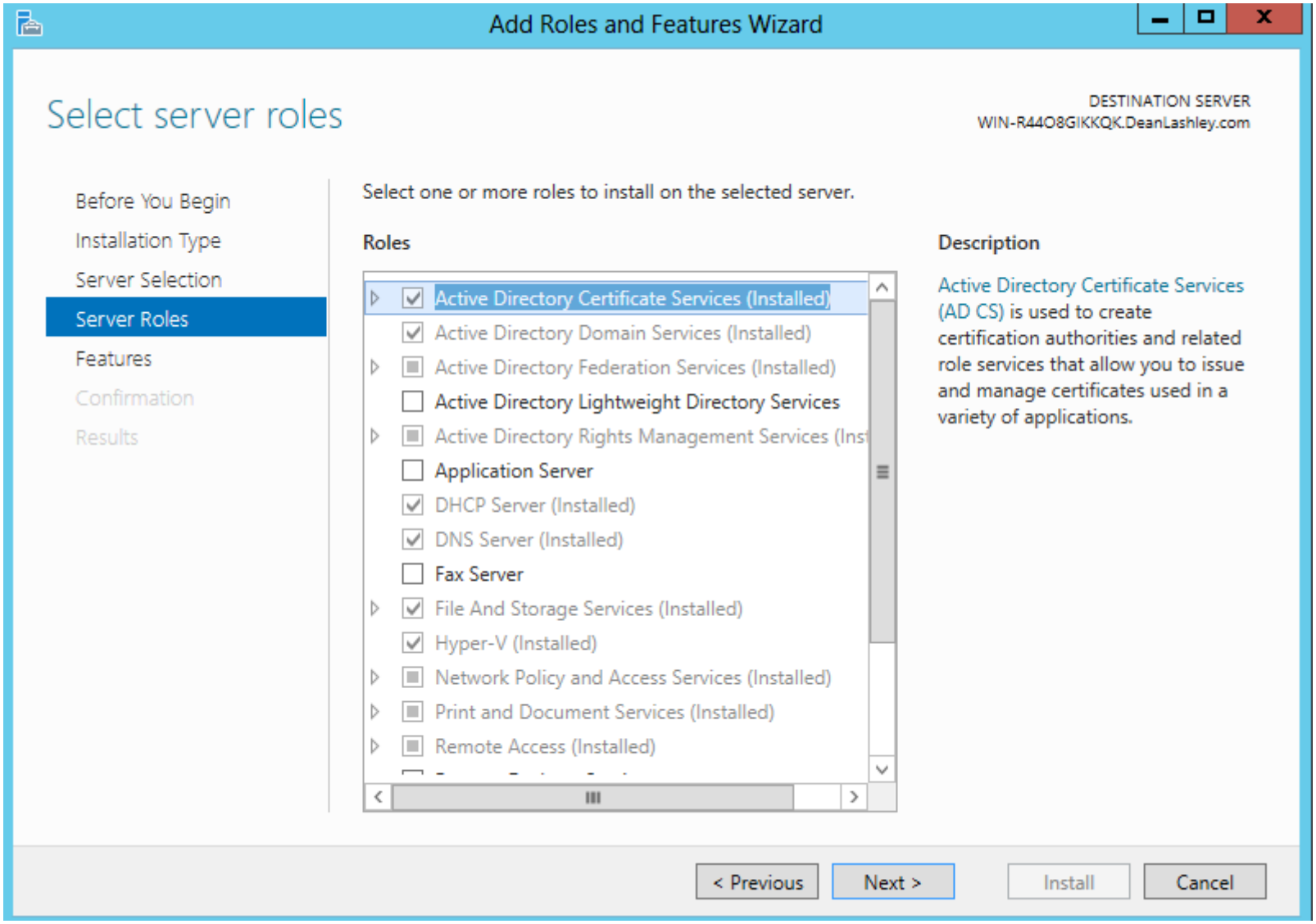
- Only TCP/IP can be used on the adapter for which NLB is enabled on each host. Do not add any other protocols (for example, IPX) to this adapter.
- The IP addresses of the servers in the cluster must be static.
- NLB does not support Dynamic Host Configuration Protocol (DHCP)

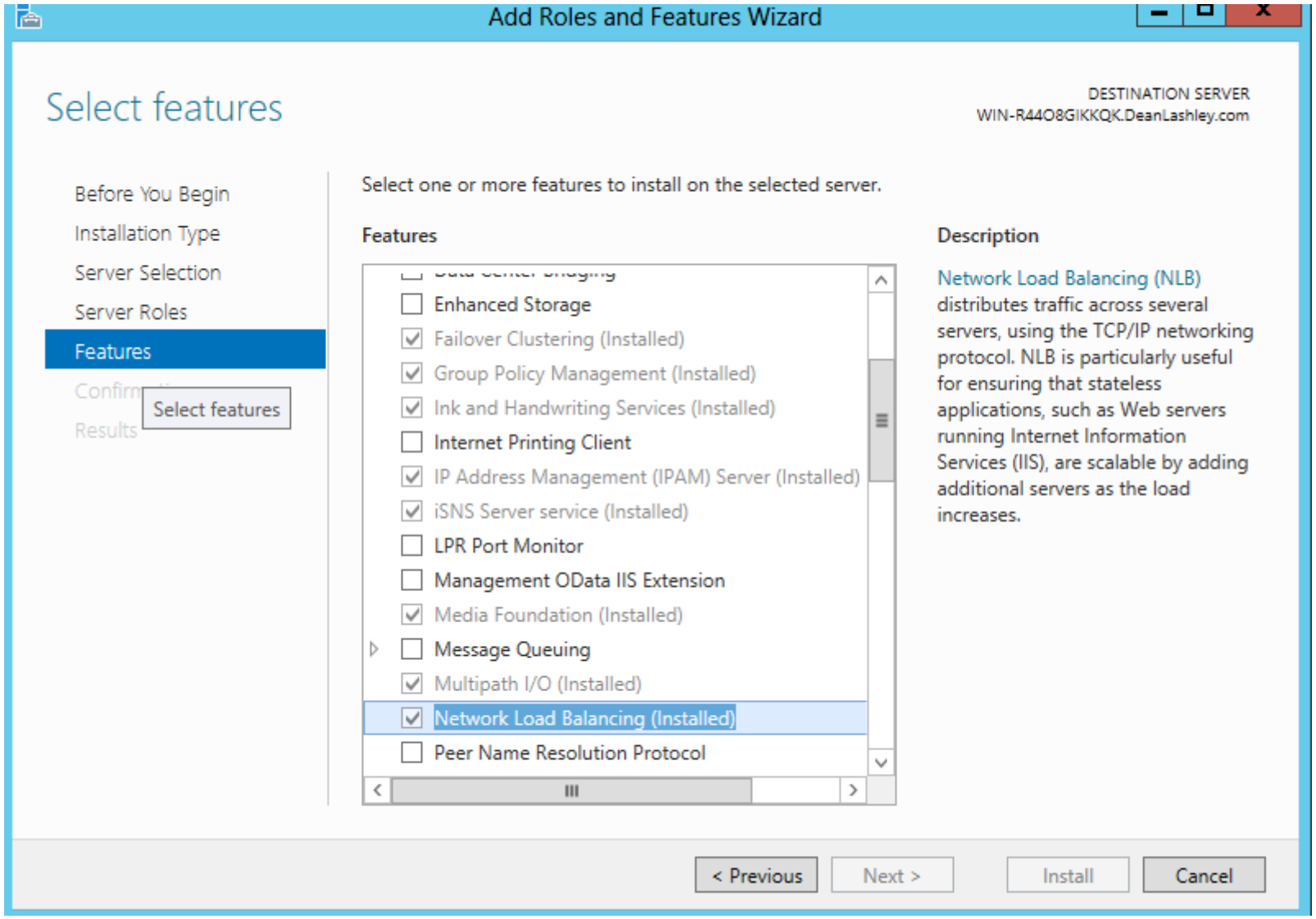

Server Manager ‣ Dashboard
Manage
Tools
View
Help
Add Roles and Features
Remove Roles and Features
Add Servers
Create Server Group
Server Manager Properties
Dashboard
Local Server
All Servers
AD CS
AD DS
AD FS
AD RMS
DHCP
DNS
File and Storage Services
Finance Server Group
Hyper-V
IIS
IPAM
mcsa group
NAP
Print Services
Remote Access
remotegroup
WELCOME TO SERVER MANAGER
QUICK START
WHAT'S NEW
LEARN MORE
1 Configure this local server
2 Add roles and features
3 Add other servers to manage
4 Create a server group
Hide
ROLES AND SERVER GROUPS
Roles: 15 | Server groups: 4 | Servers total: 7
AD CS 1
Manageability
Events
AD DS 1
Manageability
Events
AD FS 1
Manageability
Events
AD RMS 1
Manageability
Events

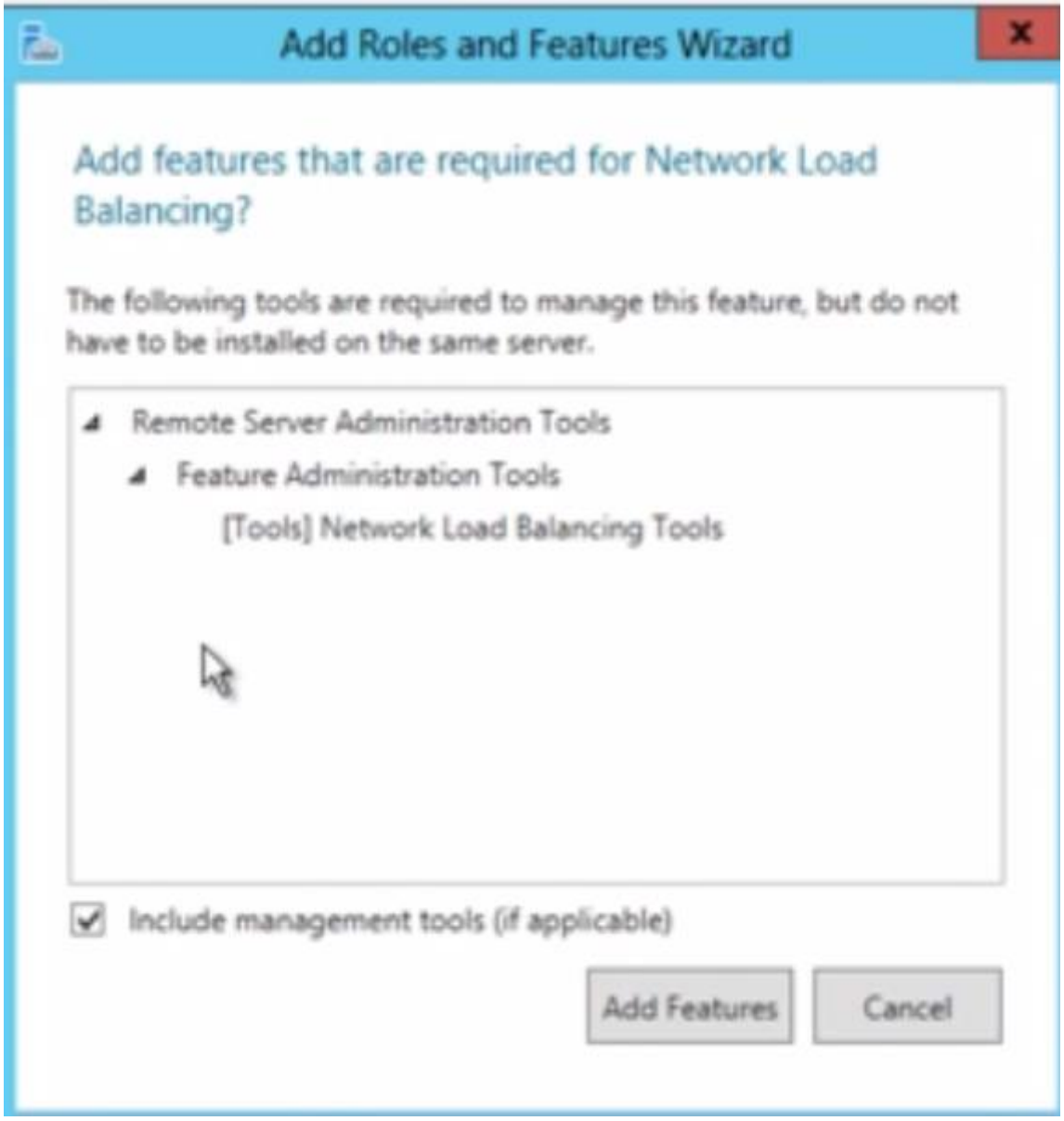

Add Roles and Features Wizard
Before you begin
DESTINATION SERVER
WIN-R44O8GIKKQK.DeanLashley.com
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Confirmation
Results
This wizard helps you install roles, role services, or features. You determine which roles, role services, or features to install based on the computing needs of your organization, such as sharing documents, or hosting a website.
To remove roles, role services, or features:
Start the Remove Roles and Features Wizard
Before you continue, verify that the following tasks have been completed:
• The Administrator account has a strong password
• Network settings, such as static IP addresses, are configured
• The most current security updates from Windows Update are installed
If you must verify that any of the preceding prerequisites have been completed, close the wizard, complete the steps, and then run the wizard again.
To continue, click Next.
Skip this page by default
< Previous
Next >
Install
Cancel

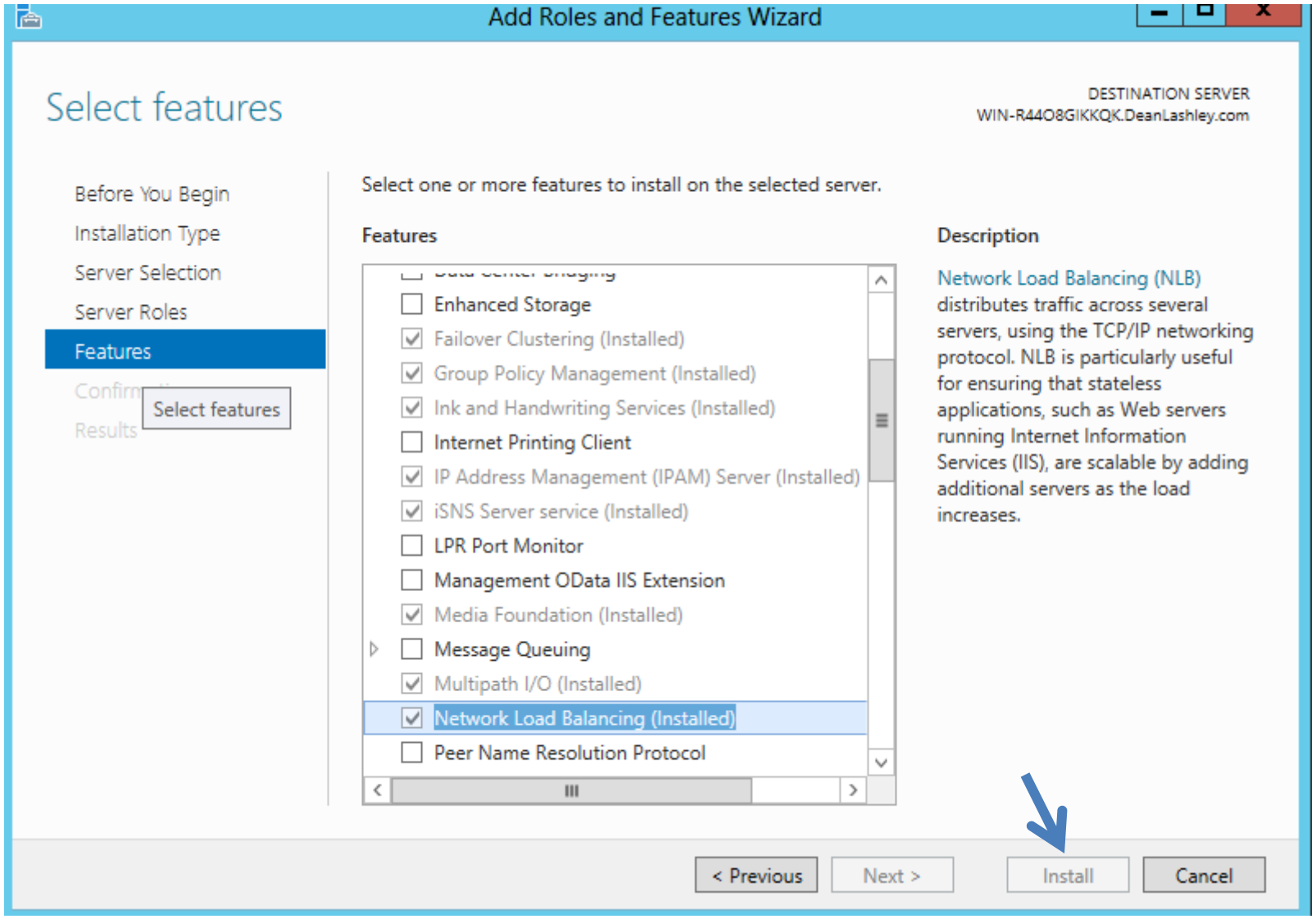

Add Roles and Features Wizard
Select installation type
DESTINATION SERVER
WIN-R44O8GIKKQK.DeanLashley.com
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Confirmation
Results
Select the installation type. You can install roles and features on a running physical computer or virtual machine, or on an offline virtual hard disk (VHD).
Role-based or feature-based installation
Configure a single server by adding roles, role services, and features.
Remote Desktop Services installation
Install required role services for Virtual Desktop Infrastructure (VDI) to create a virtual machine-based or session-based desktop deployment.
< Previous
Next >
Install
Cancel

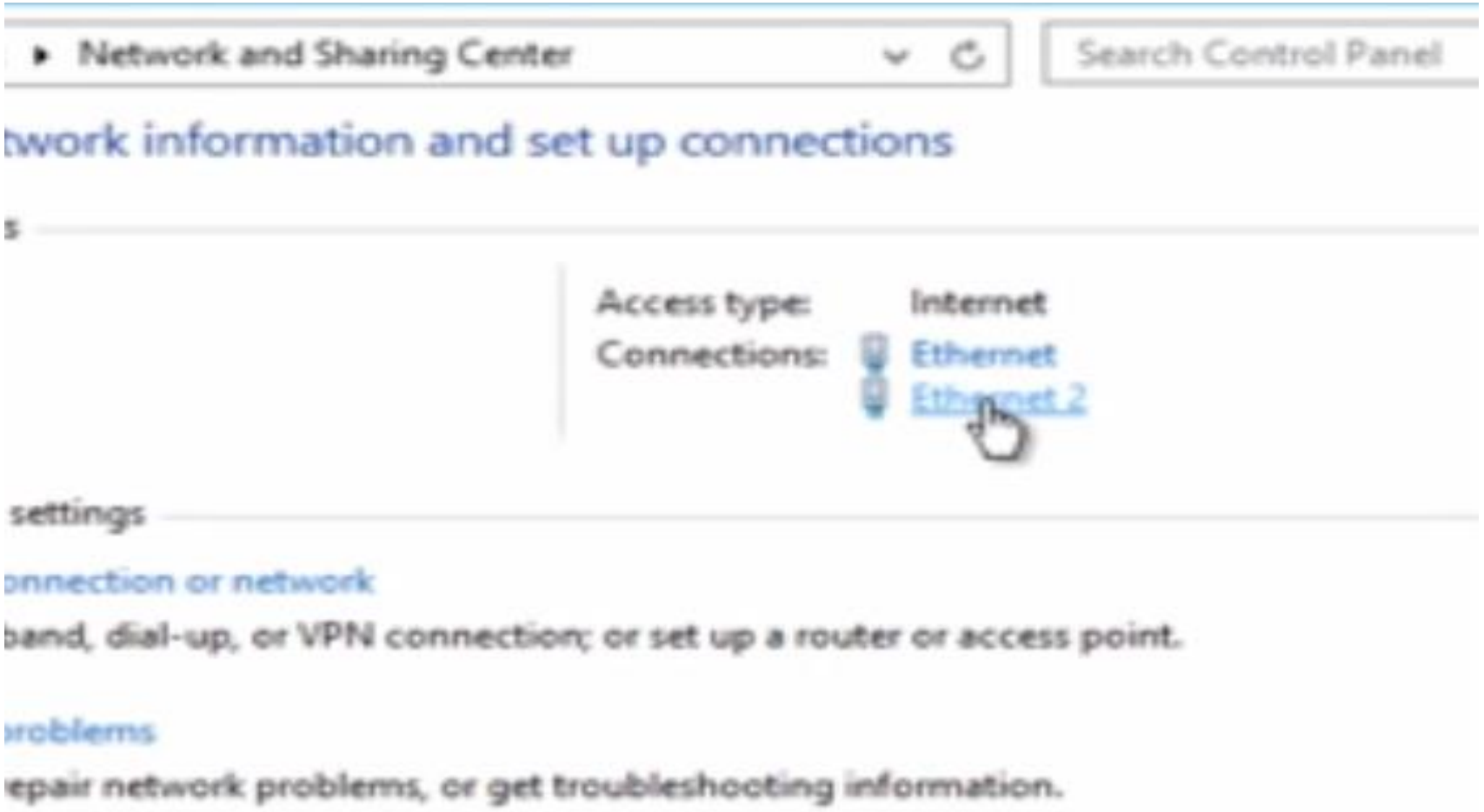

Add Roles and Features Wizard
Select destination server
DESTINATION SERVER
WIN-R44O8GIKKQK.DeanLashley.com
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Confirmation
Results
Select a server or a virtual hard disk on which to install roles and features.
Select a server from the server pool
Select a virtual hard disk
Server Pool
Filter:
Name
IP Address
Operating System
WIN-R44O8GIKKQK.Dea...
192.168.254.5,...
Microsoft Windows Server 2012 Standard
1 Computer(s) found
This page shows servers that are running Windows Server 2012, and that have been added by using the Add Servers command in Server Manager. Offline servers and newly-added servers from which data collection is still incomplete are not shown.
< Previous
Next >
Install
Cancel


Add Roles and Features Wizard
Select server roles
DESTINATION SERVER
WIN-R44O8GIKKQK.DeanLashley.com
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Confirmation
Results
Select one or more roles to install on the selected server.
Roles
Active Directory Certificate Services (Installed)
Active Directory Domain Services (Installed)
Active Directory Federation Services (Installed)
Active Directory Lightweight Directory Services
Active Directory Rights Management Services (Inst
Application Server
DHCP Server (Installed)
DNS Server (Installed)
Fax Server
File And Storage Services (Installed)
Hyper-V (Installed)
Network Policy and Access Services (Installed)
Print and Document Services (Installed)
Remote Access (Installed)
Description
Active Directory Certificate Services (AD CS) is used to create certification authorities and related role services that allow you to issue and manage certificates used in a variety of applications.
< Previous
Next >
Install
Cancel

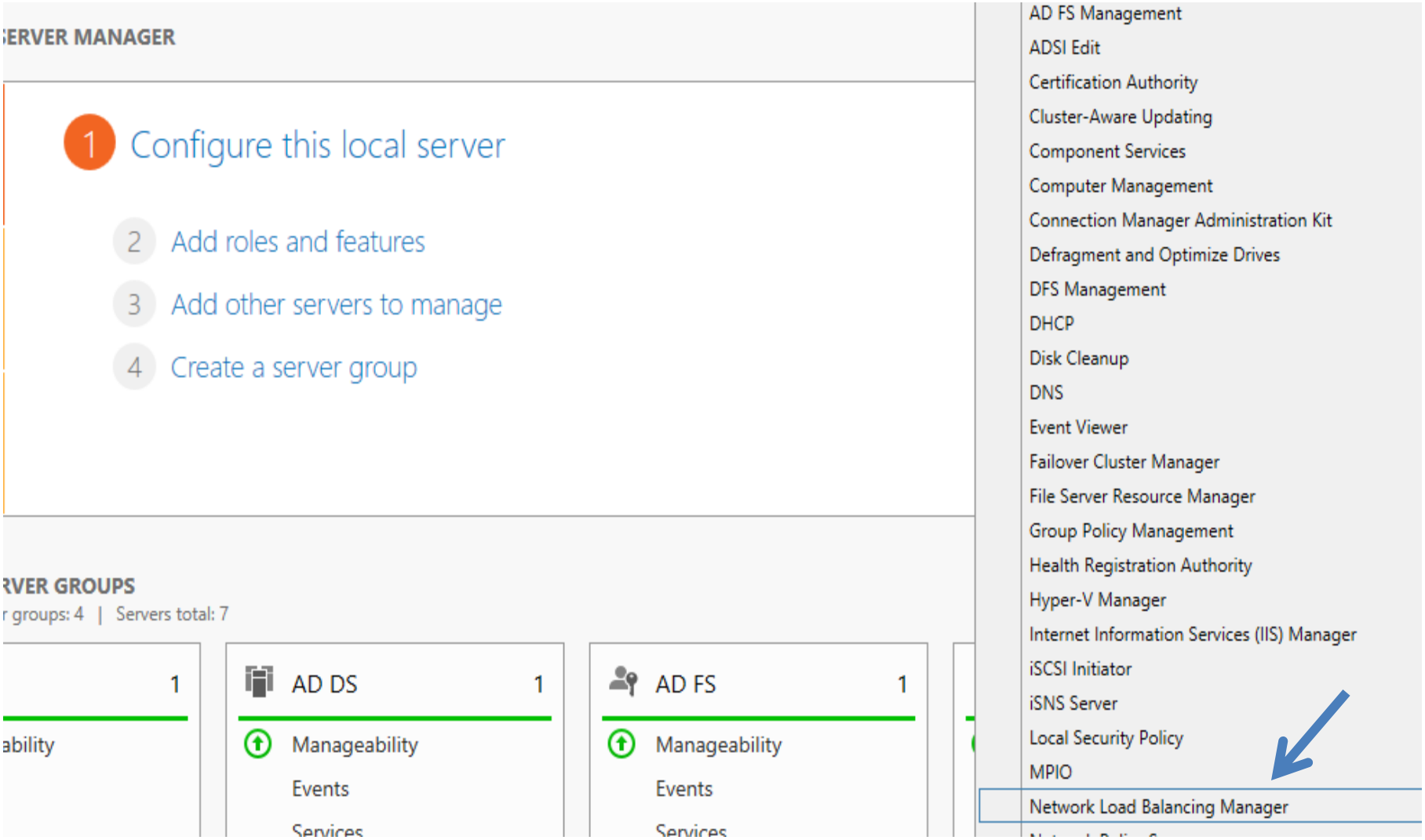

Add Roles and Features Wizard
Select features
DESTINATION SERVER
WIN-R44O8GIKKQK.DeanLashley.com
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Confirmation
Results
Select features
Select one or more features to install on the selected server.
Features
Enhanced Storage
Failover Clustering (Installed)
Group Policy Management (Installed)
Ink and Handwriting Services (Installed)
Internet Printing Client
IP Address Management (IPAM) Server (Installed)
iSNS Server service (Installed)
LPR Port Monitor
Management OData IIS Extension
Media Foundation (Installed)
Message Queuing
Multipath I/O (Installed)
Network Load Balancing (Installed)
Peer Name Resolution Protocol
Description
Network Load Balancing (NLB) distributes traffic across several servers, using the TCP/IP networking protocol. NLB is particularly useful for ensuring that stateless applications, such as Web servers running Internet Information Services (IIS), are scalable by adding additional servers as the load increases.
< Previous
Next >
Install
Cancel

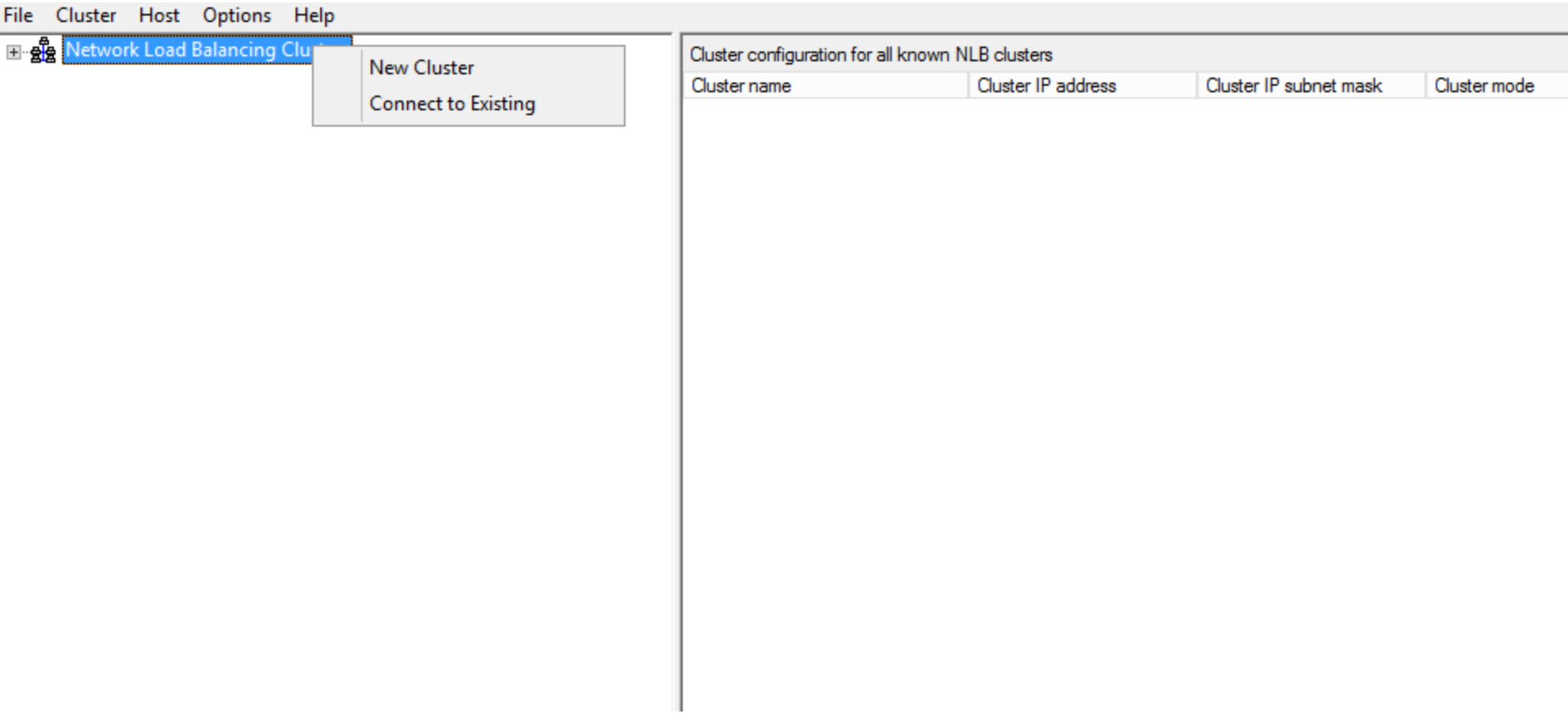

Add Roles and Features Wizard
Add features that are required for Network Load Balancing?
The following tools are required to manage this feature, but do not have to be installed on the same server.
Remote Server Administration Tools
Feature Administration Tools
[Tools] Network Load Balancing Tools
Include management tools (if applicable)
Add Features
Cancel

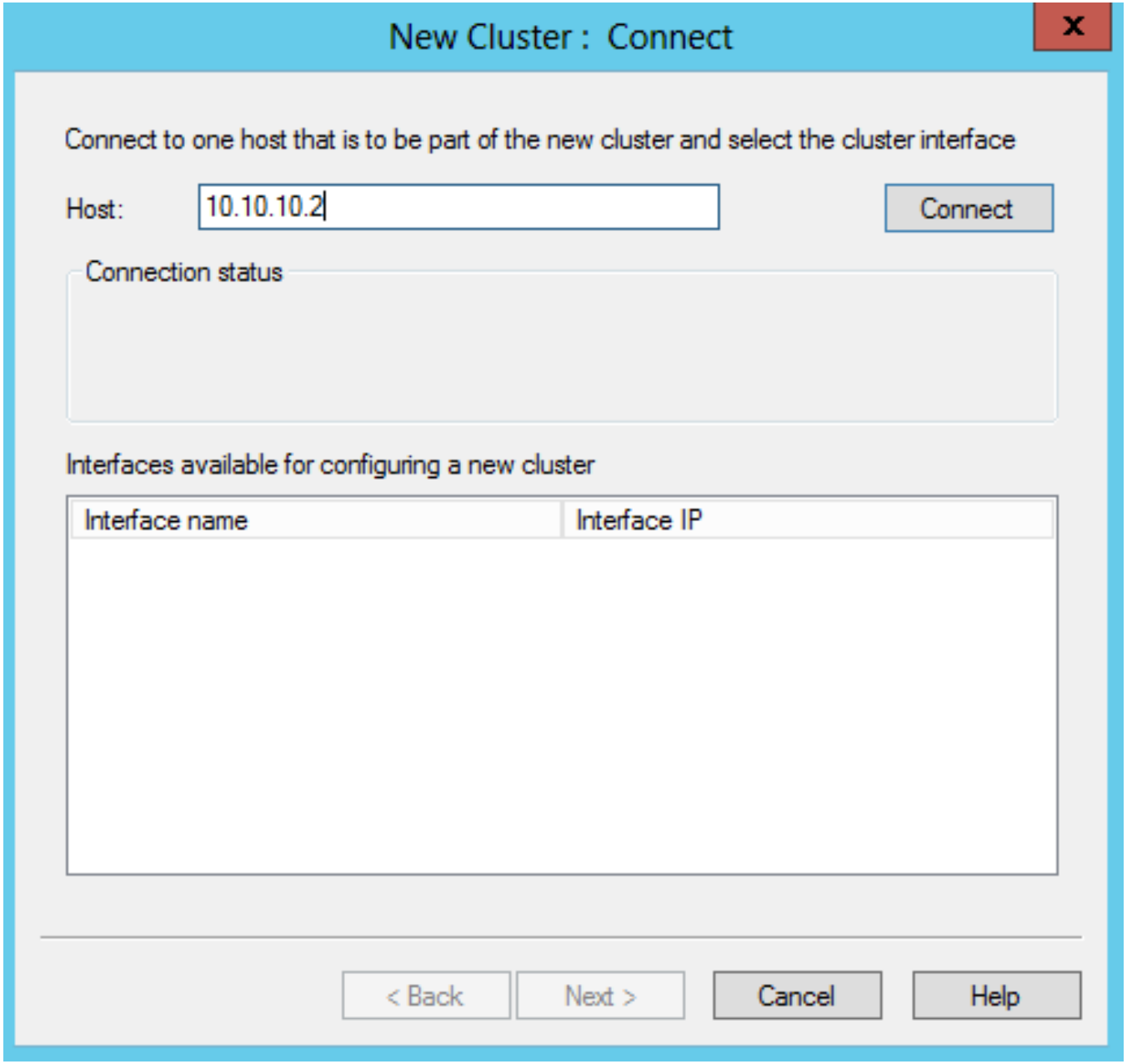

Add Roles and Features Wizard
Select features
DESTINATION SERVER
WIN-R44O8GIKKQK.DeanLashley.com
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Confirmation
Results
Select features
Select one or more features to install on the selected server.
Features
Enhanced Storage
Failover Clustering (Installed)
Group Policy Management (Installed)
Ink and Handwriting Services (Installed)
Internet Printing Client
IP Address Management (IPAM) Server (Installed)
iSNS Server service (Installed)
LPR Port Monitor
Management OData IIS Extension
Media Foundation (Installed)
Message Queuing
Multipath I/O (Installed)
Network Load Balancing (Installed)
Peer Name Resolution Protocol
Description
Network Load Balancing (NLB) distributes traffic across several servers, using the TCP/IP networking protocol. NLB is particularly useful for ensuring that stateless applications, such as Web servers running Internet Information Services (IIS), are scalable by adding additional servers as the load increases.
< Previous
Next >
Install
Cancel



The Networl Load Balancing Cluster should have two interfaces one for management
And the other to participate in NLB


ERVER MANAGER
1 Configure this local server
2 Add roles and features
3 Add other servers to manage
4 Create a server group
RVER GROUPS
r groups: 4 | Servers total: 7
1
ability
AD DS 1
Manageability
Events
Services
AD FS 1
Manageability
Events
Services
AD FS Management
ADSI Edit
Certification Authority
Cluster-Aware Updating
Component Services
Computer Management
Connection Manager Administration Kit
Defragment and Optimize Drives
DFS Management
DHCP
Disk Cleanup
DNS
Event Viewer
Failover Cluster Manager
File Server Resource Manager
Group Policy Management
Health Registration Authority
Hyper-V Manager
Internet Information Services (IIS) Manager
iSCSI Initiator
iSNS Server
Local Security Policy
MPIO
Network Load Balancing Manager


File
Cluster
Host
Options
Help
Network Load Balancing Clu
New Cluster
Connect to Existing
Cluster configuration for all known NLB clusters
Cluster name
Cluster IP address
Cluster IP subnet mask
Cluster mode


New Cluster : Connect
Connect to one host that is to be part of the new cluster and select the cluster interface
Host:
10.10.10.2
Connect
Connection status
Interfaces available for configuring a new cluster
Interface name
Interface IP
< Back
Next >
Cancel
Help

alancing Clusters

Cluster m

New Cluster : Connect

Connect to one host that is to be part of the new cluster and select the cluster interface

Host: 10.10.10.11 Connect

Connection status

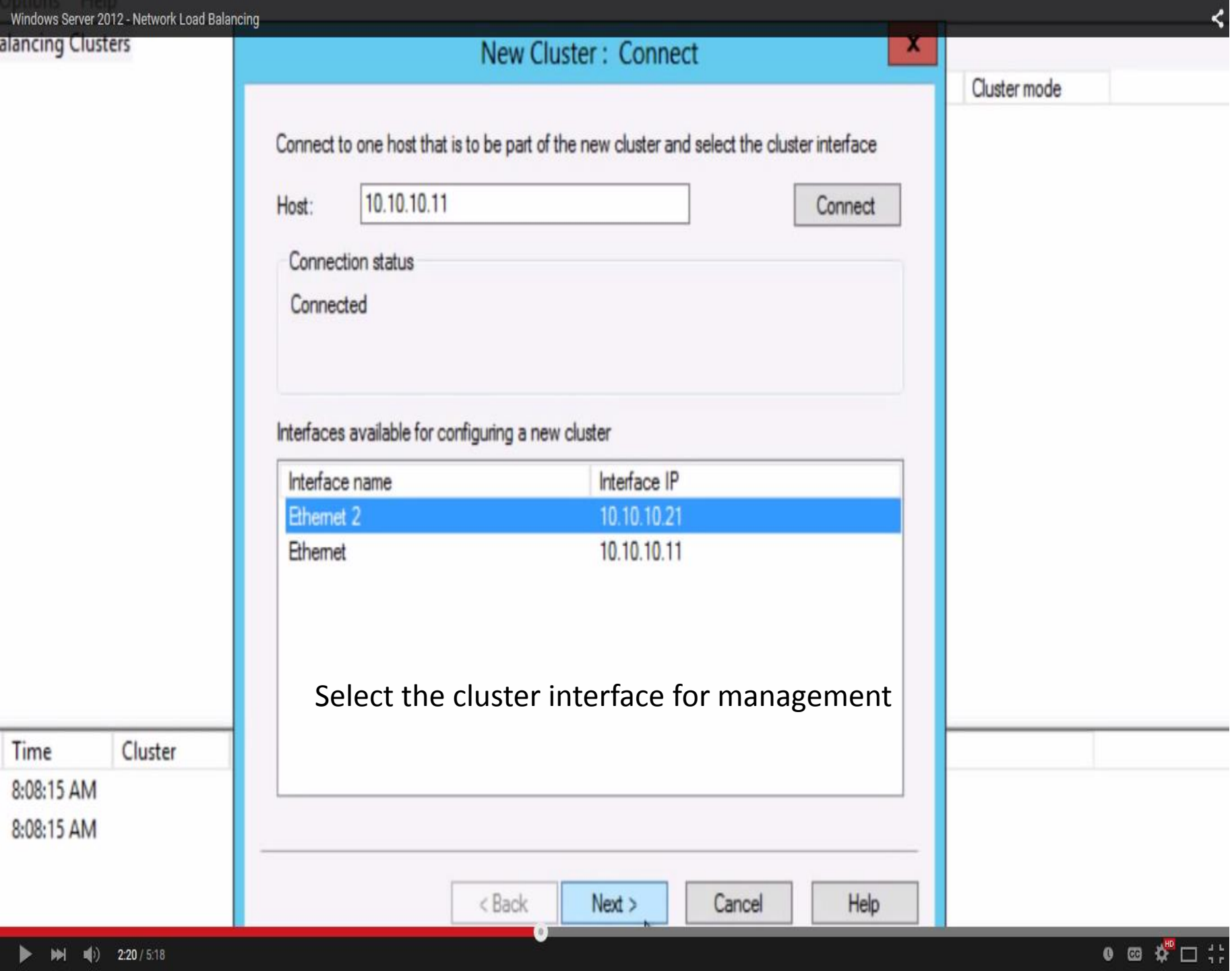
Connected

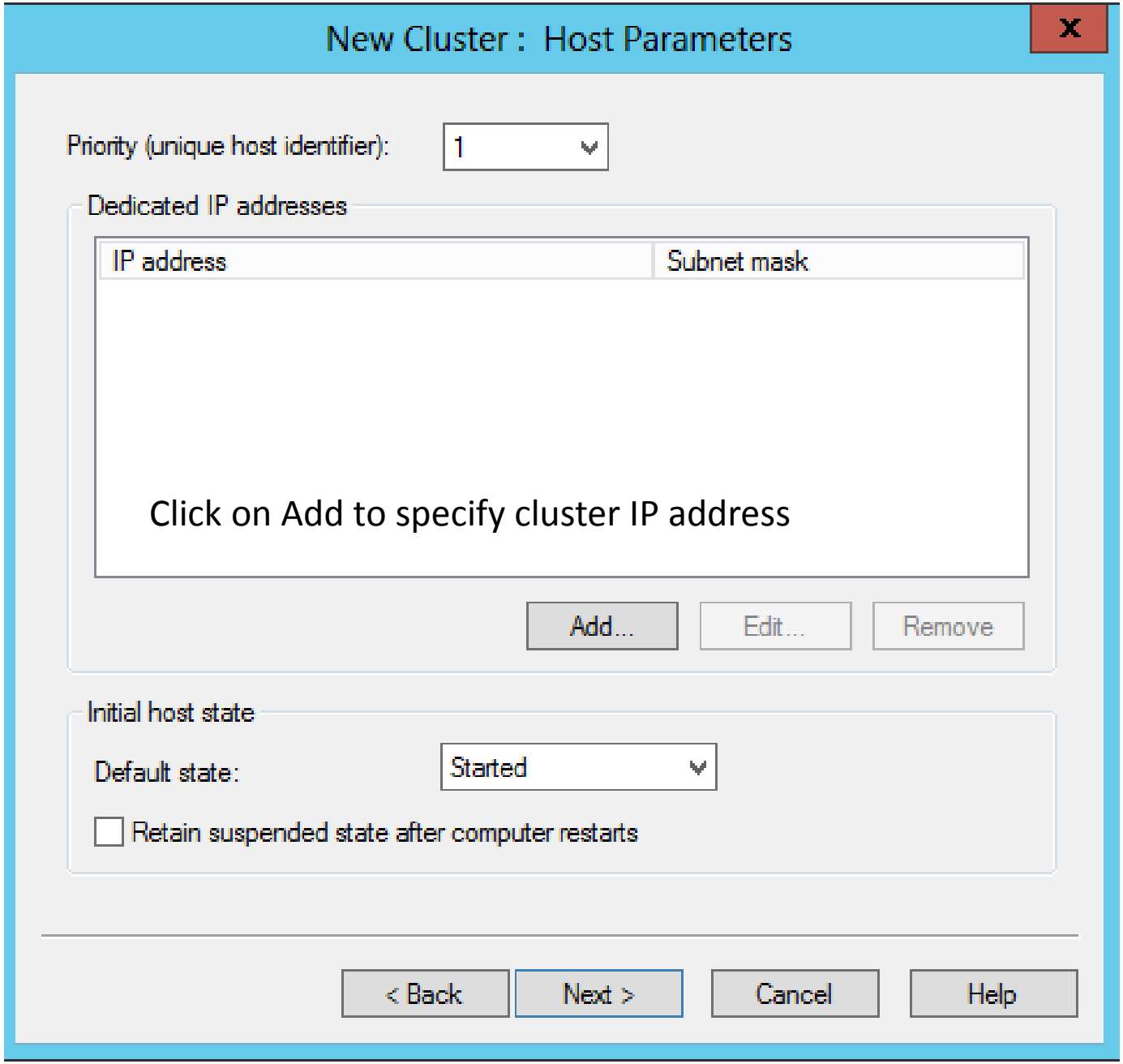
Interfaces available for configuring a new cluster

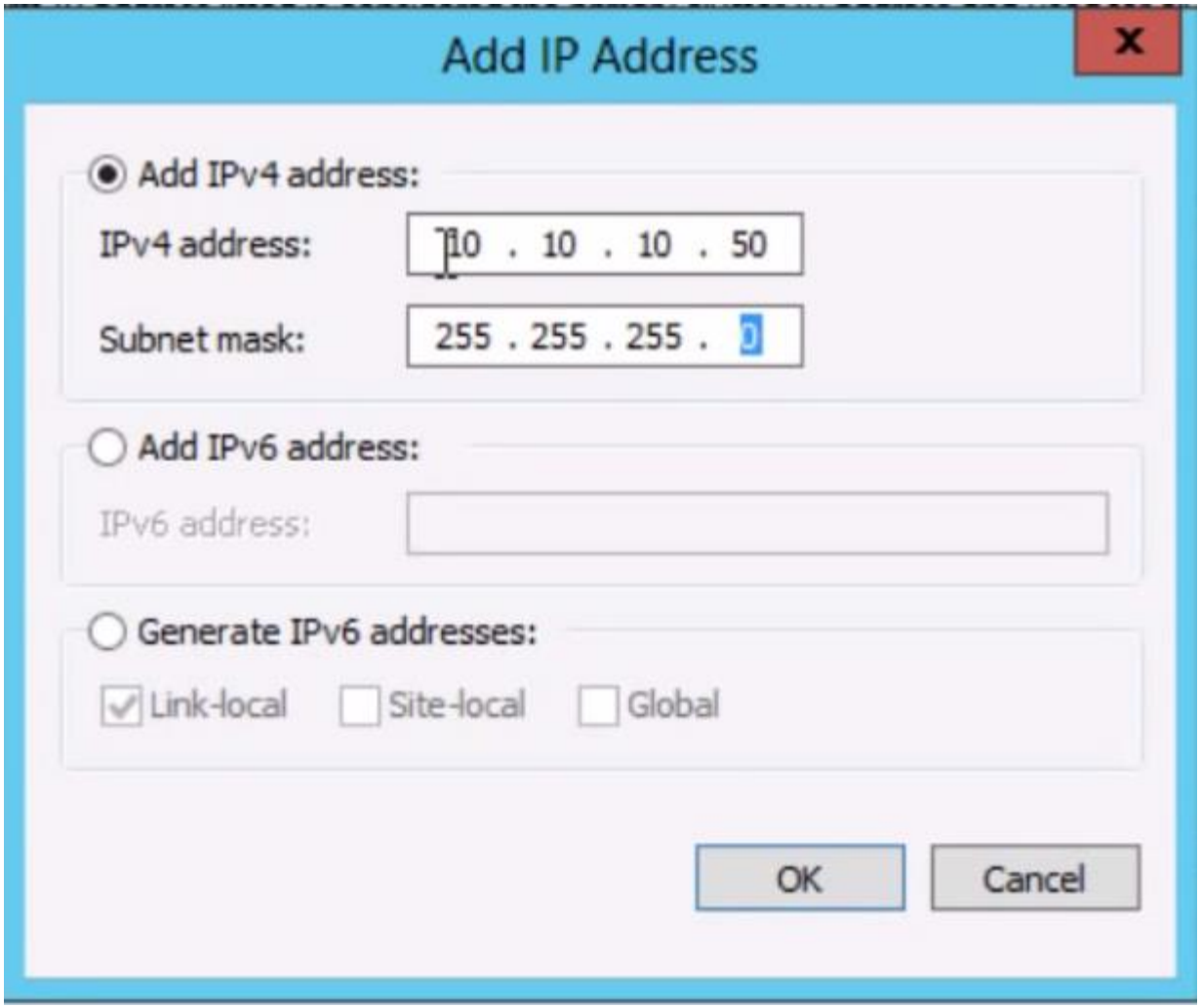
Interface name	Interface IP
Ethernet 2	10.10.10.21
Ethern	10.10.10.11

< Back Next > Cancel Help

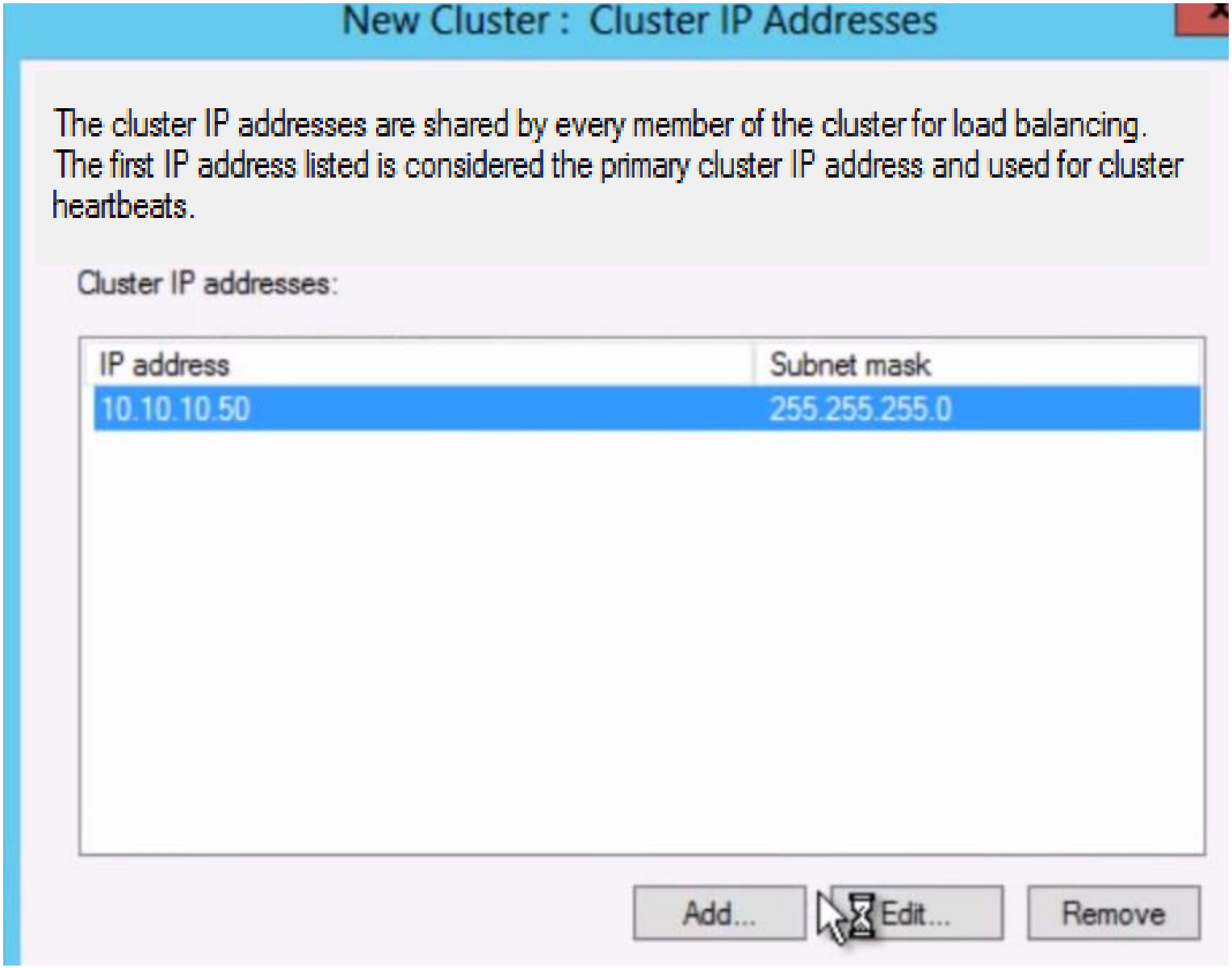
Time	Cluster
8:08:15 AM	
8:08:15 AM	

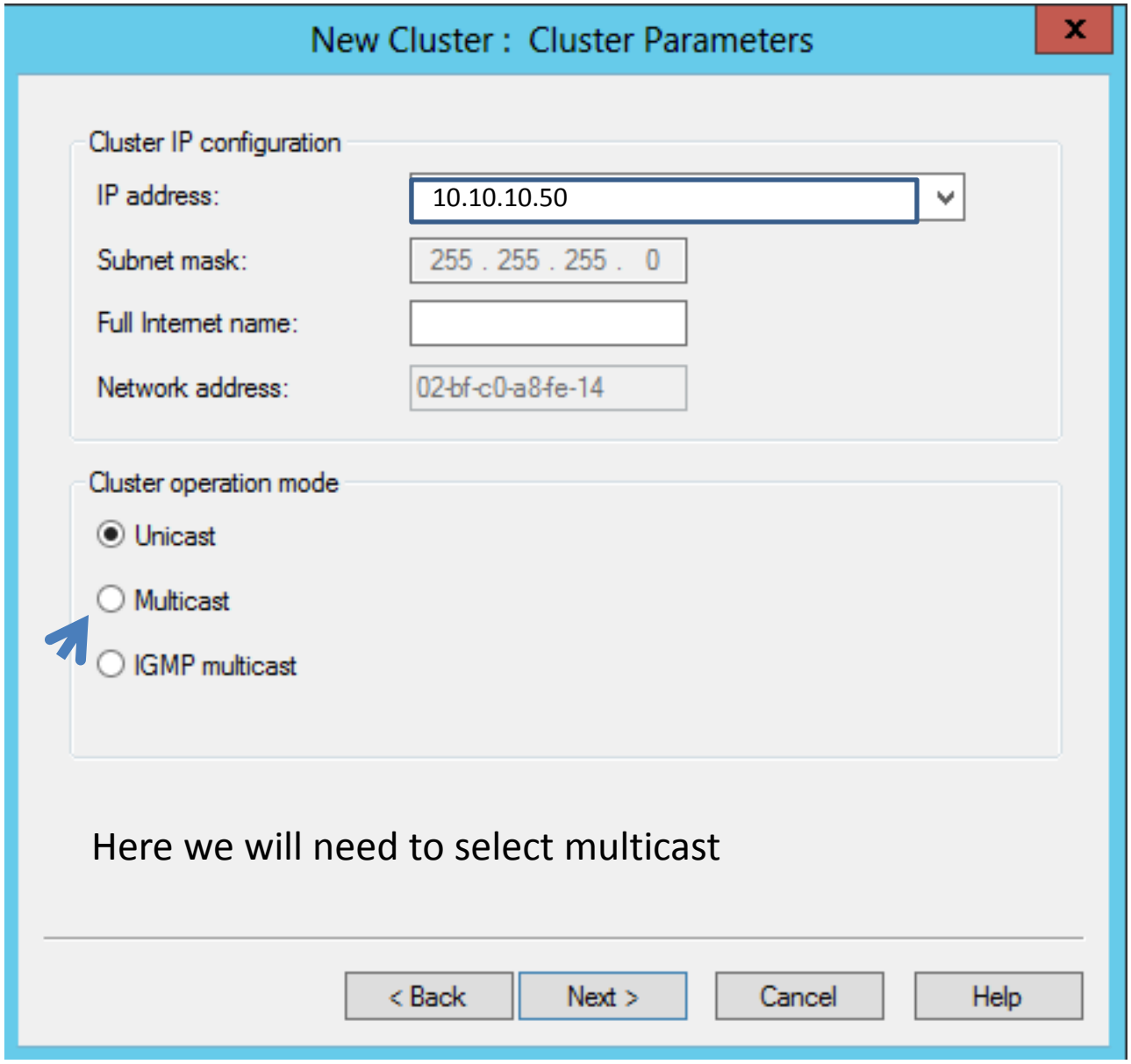

New Cluster : Connect
Connect to one host that is to be part of the new cluster and select the cluster interface
Host:
10.10.10.11
Connect
Connection status
Connected
Interfaces available for configuring a new cluster
Interface name
Interface IP
Ethernet 2
10.10.10.21
Ethernet
10.10.10.11
Select the cluster interface for management
< Back
Next >
Cancel
Help
Cluster mode
Time
Cluster
8:08:15 AM
8:08:15 AM

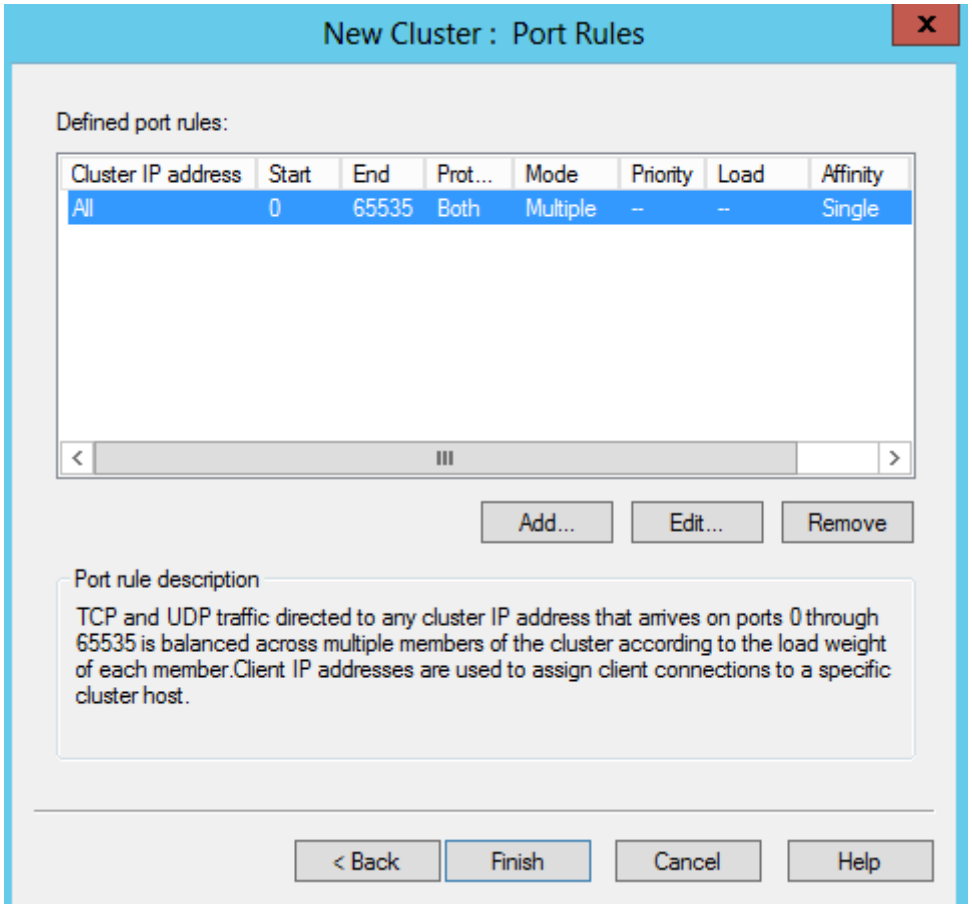

New Cluster : Host Parameters
Priority (unique host identifier):
1
Dedicated IP addresses
IP address
Subnet mask
Click on Add to specify cluster IP address
Add...
Edit...
Remove
Initial host state
Default state:
Started
Retain suspended state after computer restarts
< Back
Next >
Cancel
Help



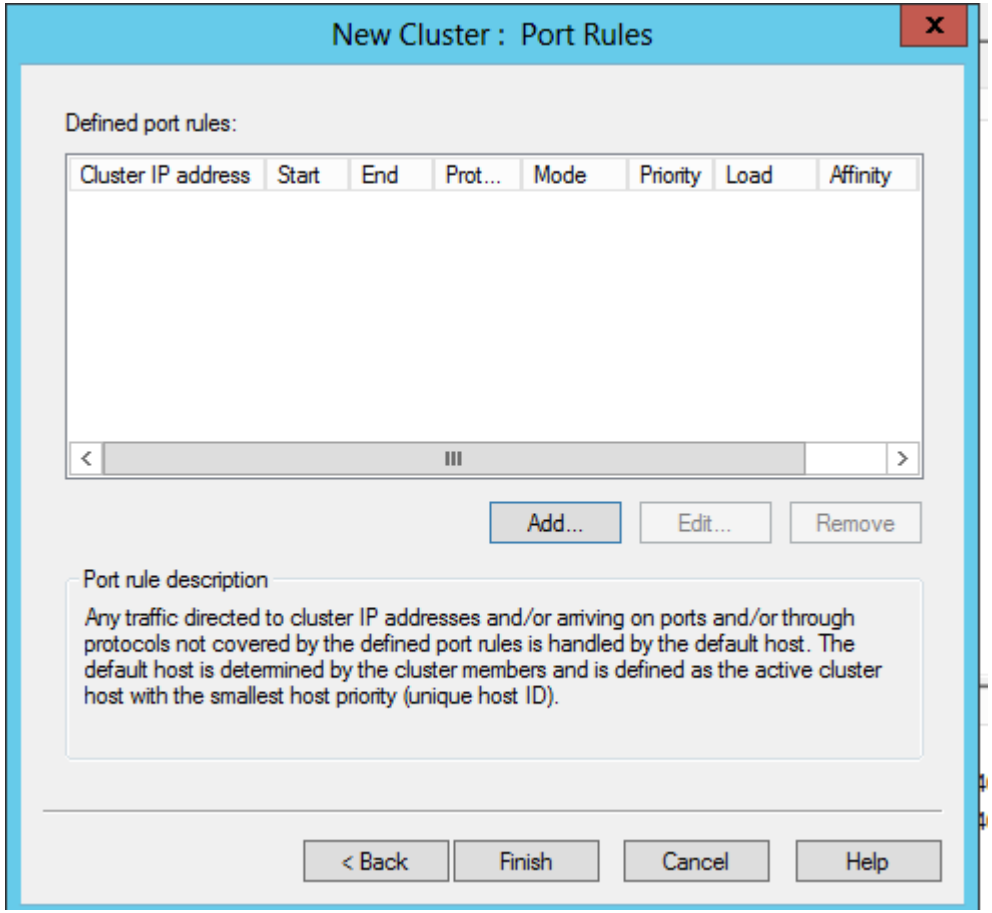
This is the IP that other hosts in the network will use to access cluster resources


New Cluster : Cluster IP Addresses
The cluster IP addresses are shared by every member of the cluster for load balancing. The first IP address listed is considered the primary cluster IP address and used for cluster heartbeats.
Cluster IP addresses:
IP address
Subnet mask
10.10.10.50
255.255.255.0
Add...
Edit...
Remove

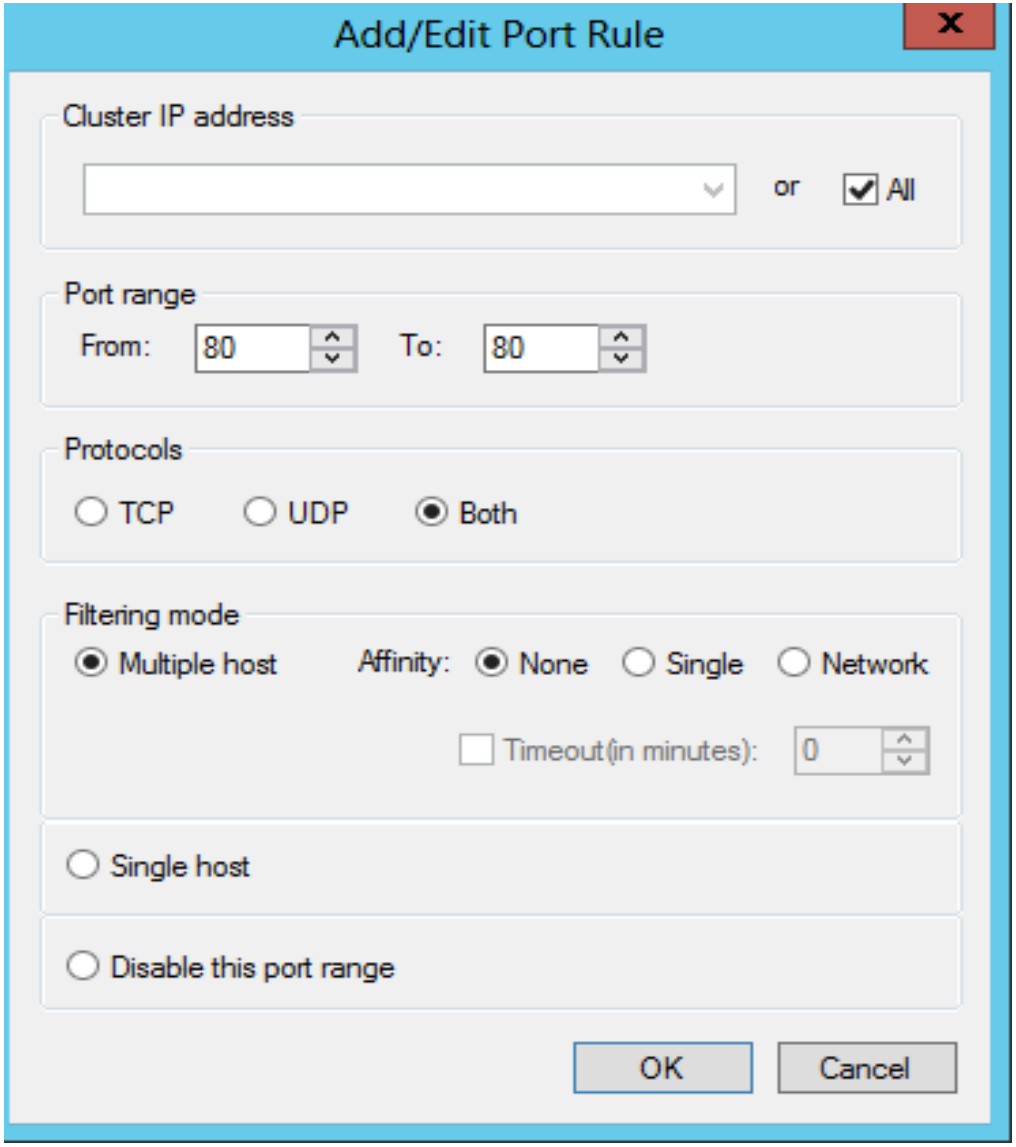

New Cluster : Cluster Parameters
Cluster IP configuration
IP address:
10.10.10.50
Subnet mask:
255 . 255 . 255 . 0
Full Internet name:
Network address:
02-bf-c0-a8-fe-14
Cluster operation mode
Unicast
Multicast
IGMP multicast
Here we will need to select multicast
< Back
Next >
Cancel
Help



On the Port Rules page the default is to forward every port



We only want web services so we click on remove then click on Add to Add Port 80



Select Affinity to None

No Affinity

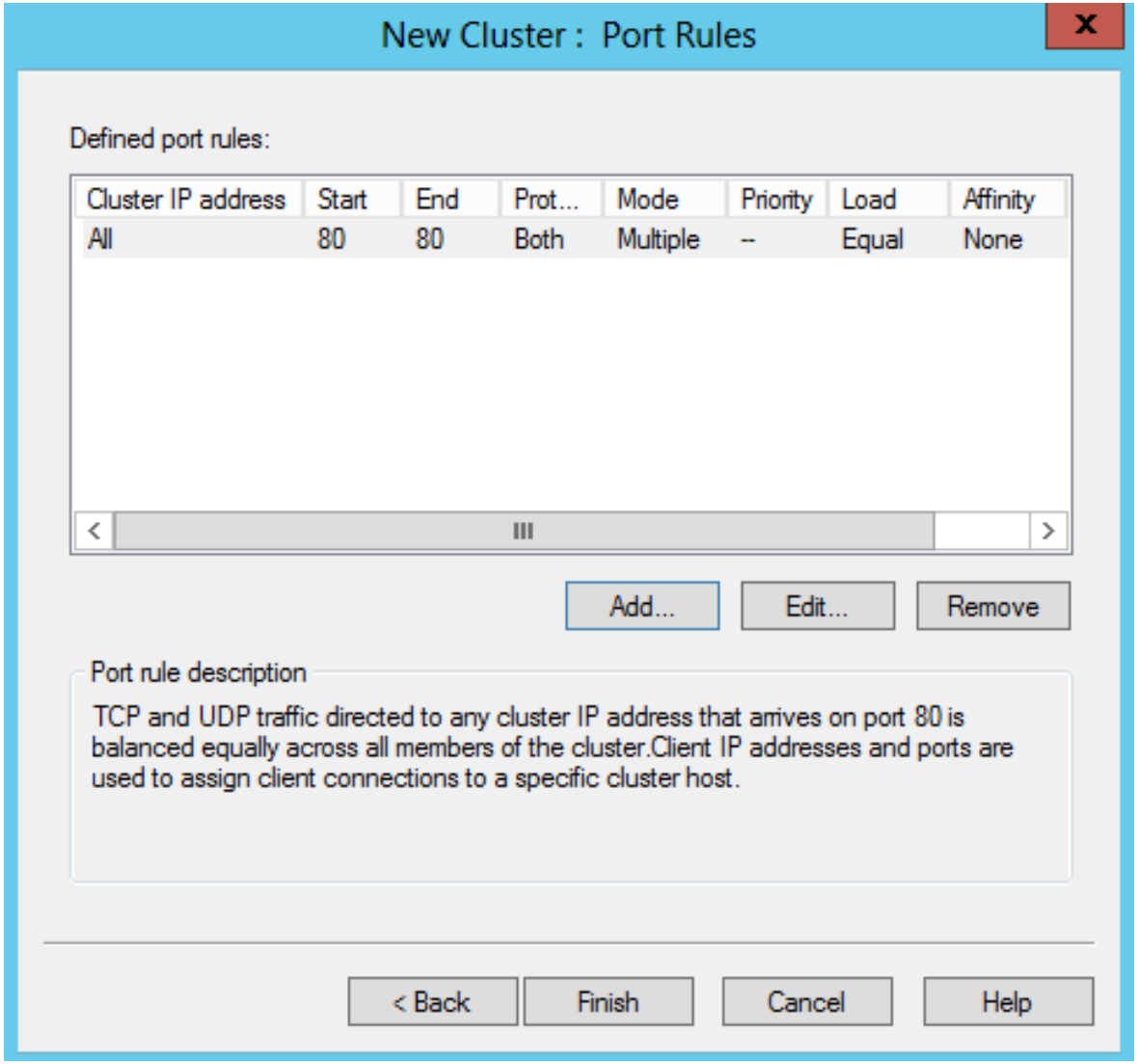
With No affinity, NLB does not associate clients with a particular member. Every client request can be load balanced to any member. This affinity provides the best performance but might disrupt clients with established sessions, because subsequent requests might be load balanced to other members where the session information does not exist.

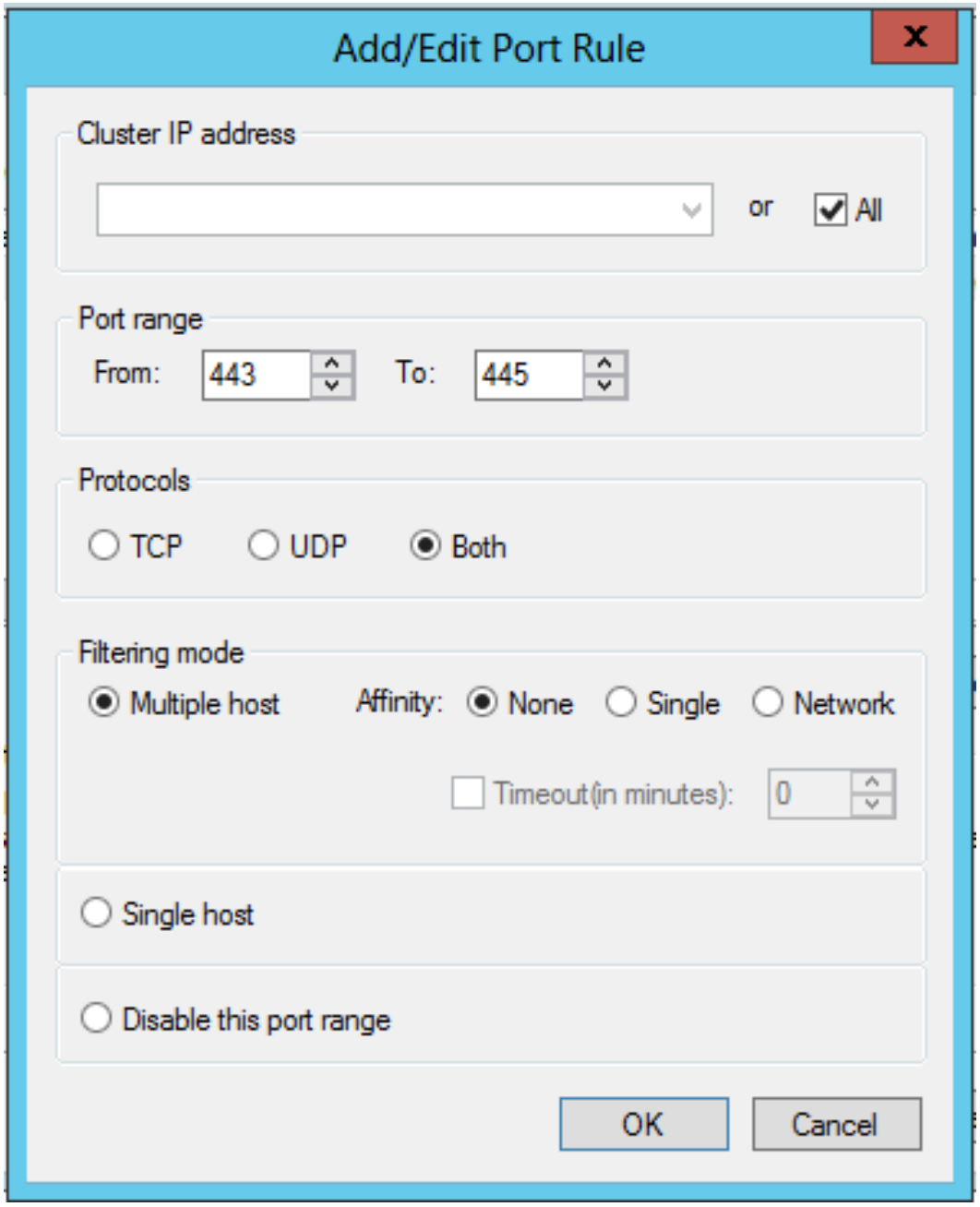
Single Affinity

In Single affinity, NLB associates clients with particular members by using the client's IP address. Thus, requests coming from the same client IP address always reach the same member. This affinity provides the best support for clients that use sessions on an intranet. These clients cannot use No affinity because their sessions could be disrupted. Additionally, these clients cannot use Class C affinity because intranet clients typically have IP addresses within a narrow range. It is likely that this range is so narrow that all clients on an intranet have the same Class C address, which means that one member might process all of the requests while other members remain idle.

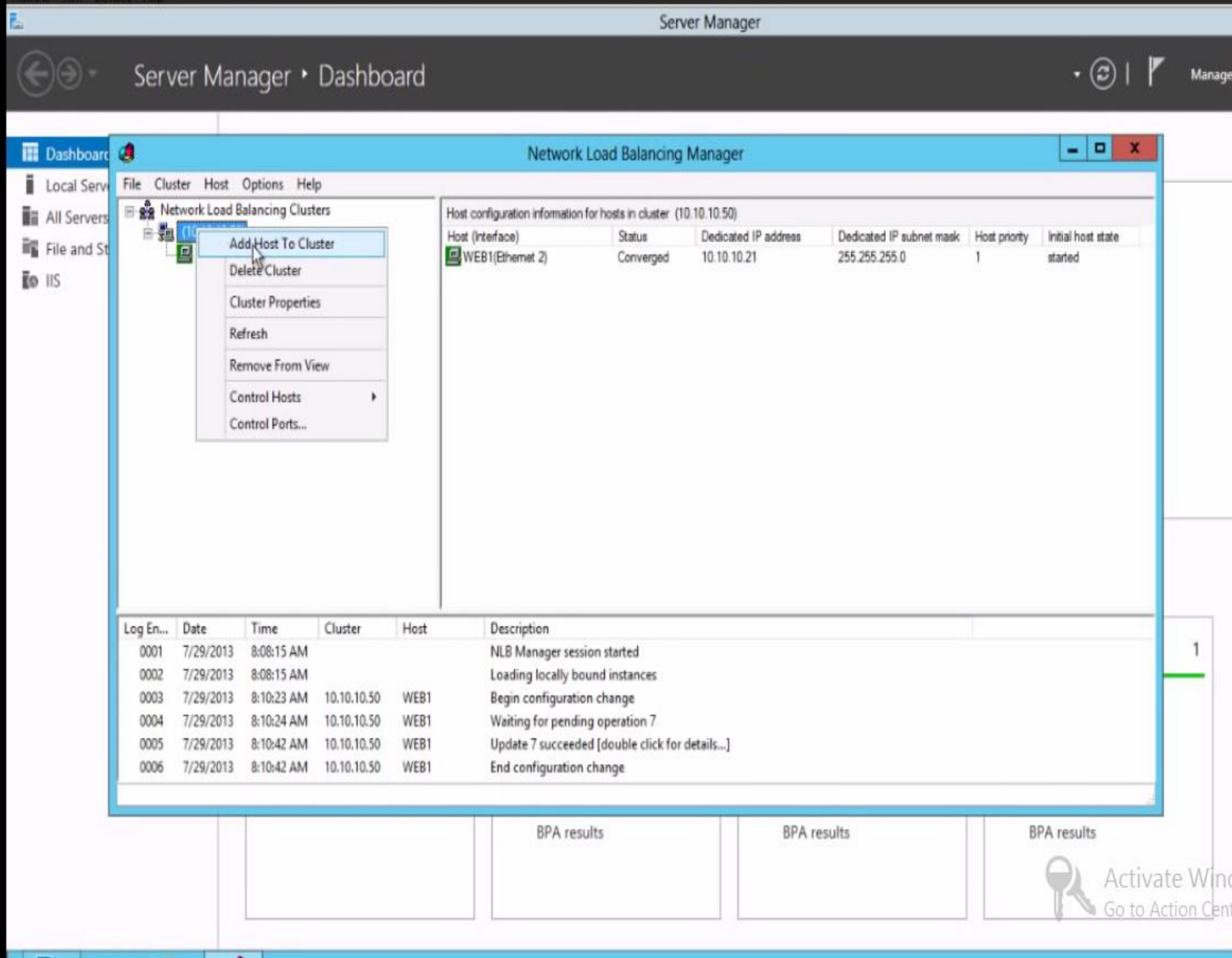
Class C Affinity

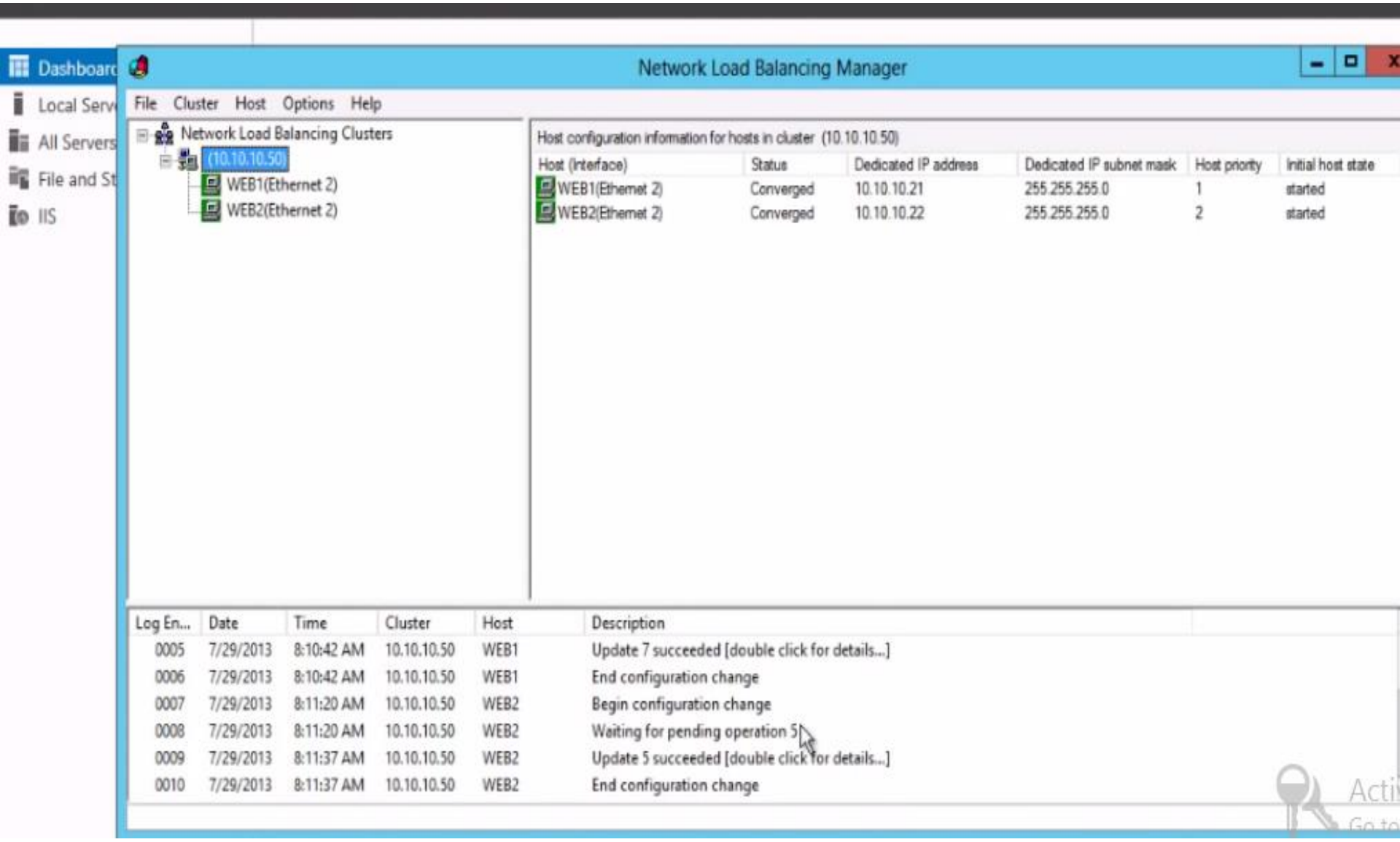
With Class C affinity, NLB associates clients with particular members by using the Class C portion of the client's IP address. Thus, clients coming from the same Class C address range always access the same member. This affinity provides the best performance for clusters serving the Internet.


New Cluster : Port Rules
Defined port rules:
Cluster IP address
Start
End
Prot...
Mode
Priority
Load
Affinity
All
80
80
Both
Multiple
--
Equal
None
Add...
Edit...
Remove
Port rule description
TCP and UDP traffic directed to any cluster IP address that arrives on port 80 is balanced equally across all members of the cluster.Client IP addresses and ports are used to assign client connections to a specific cluster host.
< Back
Finish
Cancel
Help


Add/Edit Port Rule
Cluster IP address
or
All
Port range
From:
443
To:
445
Protocols
TCP
UDP
Both
Filtering mode
Multiple host
Affinity:
None
Single
Network
Timeout(in minutes):
0
Single host
Disable this port range
OK
Cancel

Windows Server 2012 - Network Load Balancing




Dashboard
Local Serv
All Servers
File and St
IIS
Network Load Balancing Manager
File Cluster Host Options Help
Network Load Balancing Clusters
(10.10.10.50)
WEB1(Ethernet 2)
WEB2(Ethernet 2)
Host configuration information for hosts in cluster (10.10.10.50)
Host (Interface) Status Dedicated IP address Dedicated IP subnet mask Host priority Initial host state
WEB1(Ethernet 2) Converged 10.10.10.21 255.255.255.0 1 started
WEB2(Ethernet 2) Converged 10.10.10.22 255.255.255.0 2 started
Log En... Date Time Cluster Host Description
0005 7/29/2013 8:10:42 AM 10.10.10.50 WEB1 Update 7 succeeded [double click for details...]
0006 7/29/2013 8:10:42 AM 10.10.10.50 WEB1 End configuration change
0007 7/29/2013 8:11:20 AM 10.10.10.50 WEB2 Begin configuration change
0008 7/29/2013 8:11:20 AM 10.10.10.50 WEB2 Waiting for pending operation 5
0009 7/29/2013 8:11:37 AM 10.10.10.50 WEB2 Update 5 succeeded [double click for details...]
0010 7/29/2013 8:11:37 AM 10.10.10.50 WEB2 End configuration change