Network Discovery without Computer Browser service

michaelfirsov.wordpress.com/network-discovery-without-computer-browser-service

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Many of you may have seen plenty of questions on msdn/technet regarding network discovery in Windows 10 – something like “On my newly installed Windows 10 no computers (or not all) show up in Network folder”. This problem gets just more complicated when various OS are being used throughout an organization: for example, some users can see one subset of computers in their Network Neighborhood when logged on to a Windows 7 workstations and see the other when logged on to a Windows 10 workstation. Before making any suggestions about what can be causing this behaviour let’s recap what two main network discovery methods exist in Windows networks:

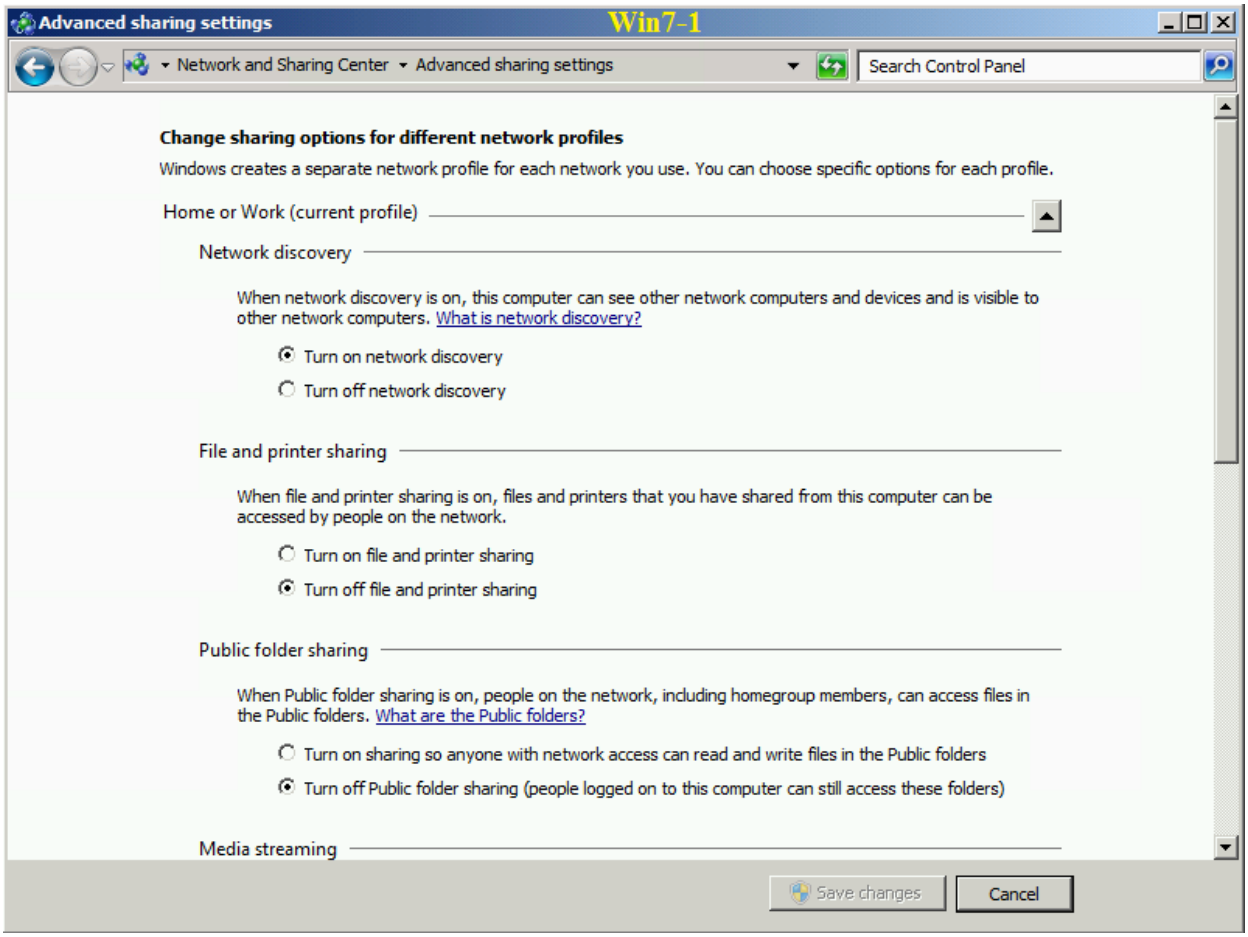
1) Computer Browser service which depends on SMB1 (it was already in use in Windows NT)

2) WS-DISCOVERY protocol (presented in Windows Vista)

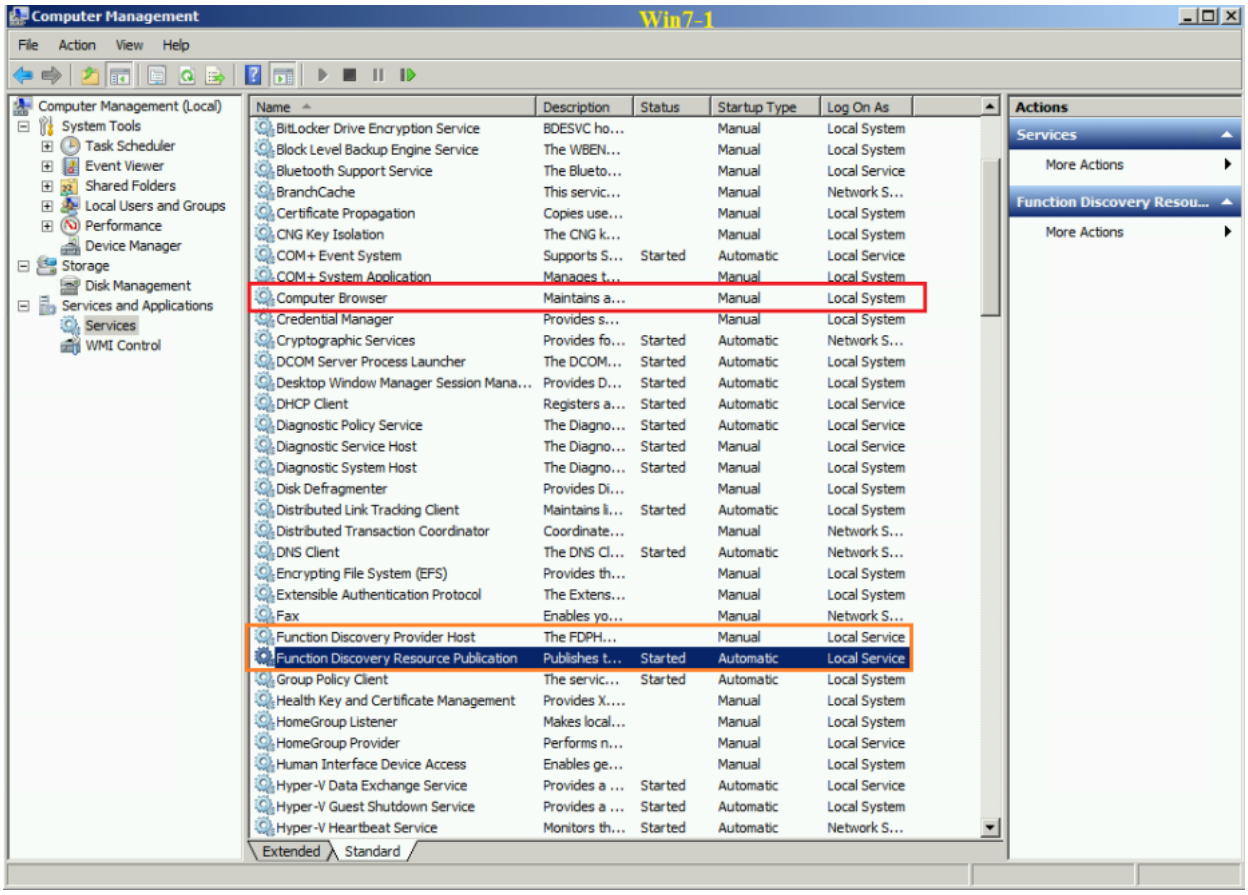
In times of Windows XP (and I think in times of Windows 7/2008R2 as well) most network administrators were using Computer Browser service to populate Network Neighborhood folder: it was enabled by default on all Windows XP computers and was set to start manually on Windows 7 computers – it was possible to create a policy which starts Computer Browser service on all computers and continue using the old discovery method. Please note that using Computer Browser service would not prevent the new WS-Discovery protocol from discovering network devices on computers with operating systems satrting from Windows Vista, thus making the resulting list of computers and network devices the total of the two lists provided by the two distinct protocols.

In Windows 10 Computer Browser service is not installed by default because the corresponding *SMB 1.0/CIFS File Sharing Support* service is now the optional Windows component so to see the list of computers in Network folder Windows 10 clients may rely solely on WS-Discovery protocol. In this blog post I’d like to describe the most common situations with network discovery without *Computer Browser* service in the mixed Windows 7/Windows 10 environments from Windows 7 and Windows 10 perspective. Consider you have two Windows 7 and two Windows 10 workstations in the network – what each of them will see in their own Network folders by default and what must be done to make sure ALL workstations and servers are visible in each computer’s Network? Let’s try to find the answers…

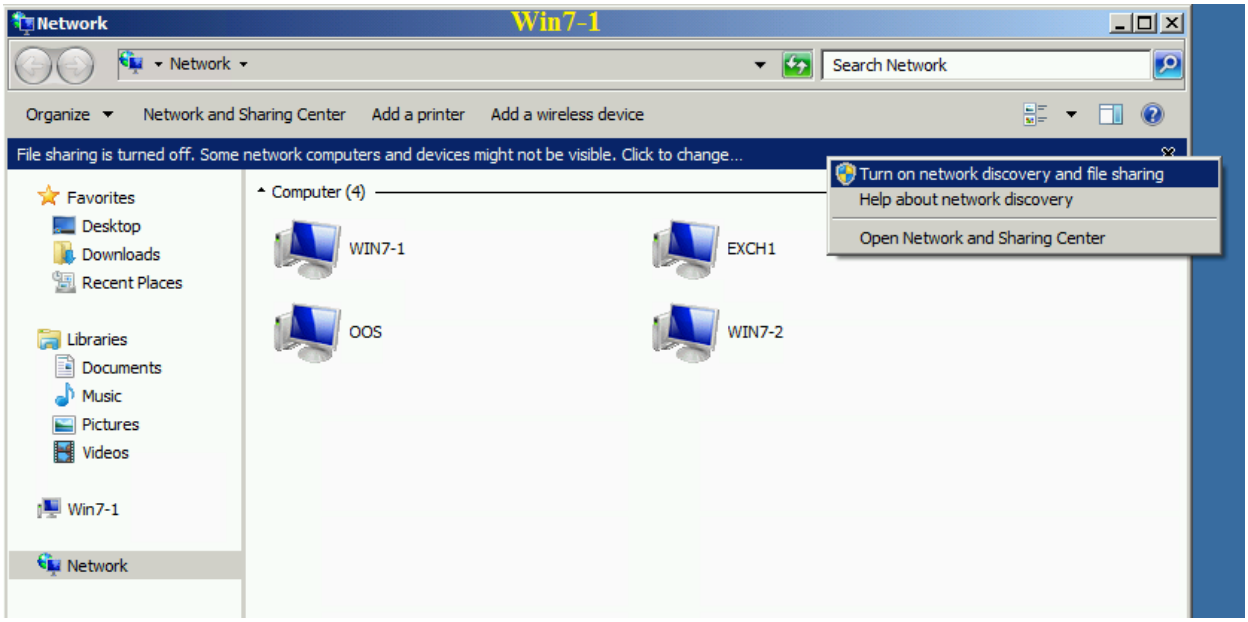
Consider you have deployed two new Windows 7 computers – Win7-1 and Win7-2 – in your production network (my test network consists of the domain controller – DC, Exchange server – Exch1 and Office Online Server – OOS) – after the first logon I want to see the default network discovery/file sharing settings on each of them:



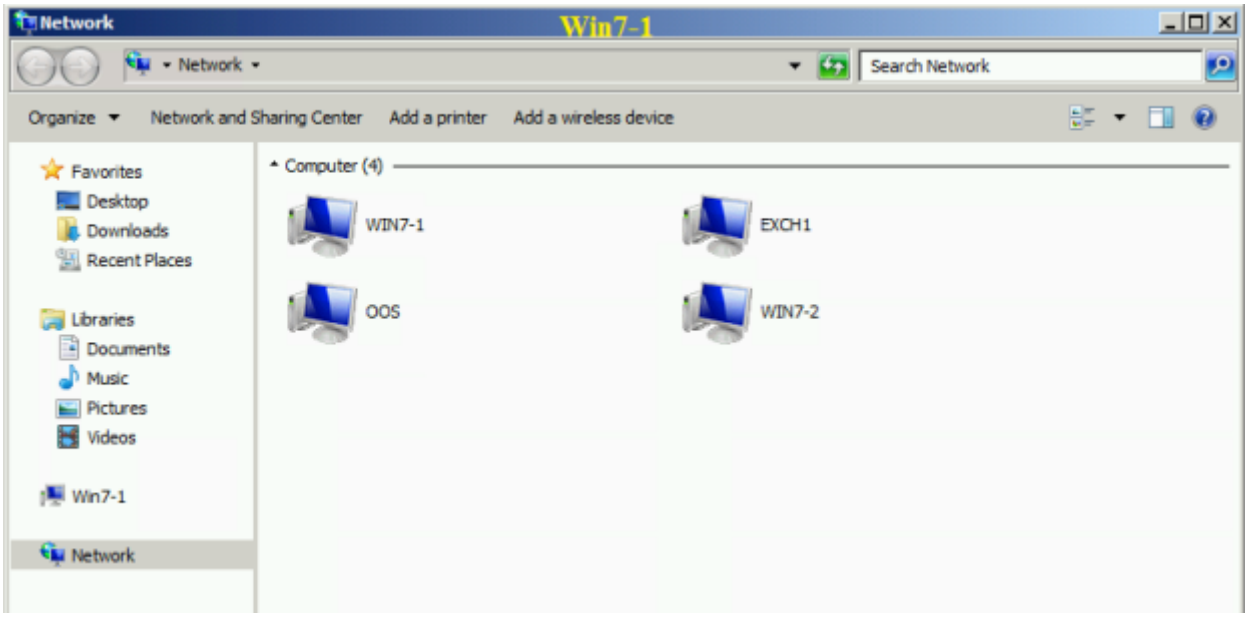
As you see the **Network discovery** is turned on while the **File and printer sharing** is turned off. Now let's see whether the corresponding services – *Function Discovery Provider Host* and *Function Discovery Resource Publication* are enabled:



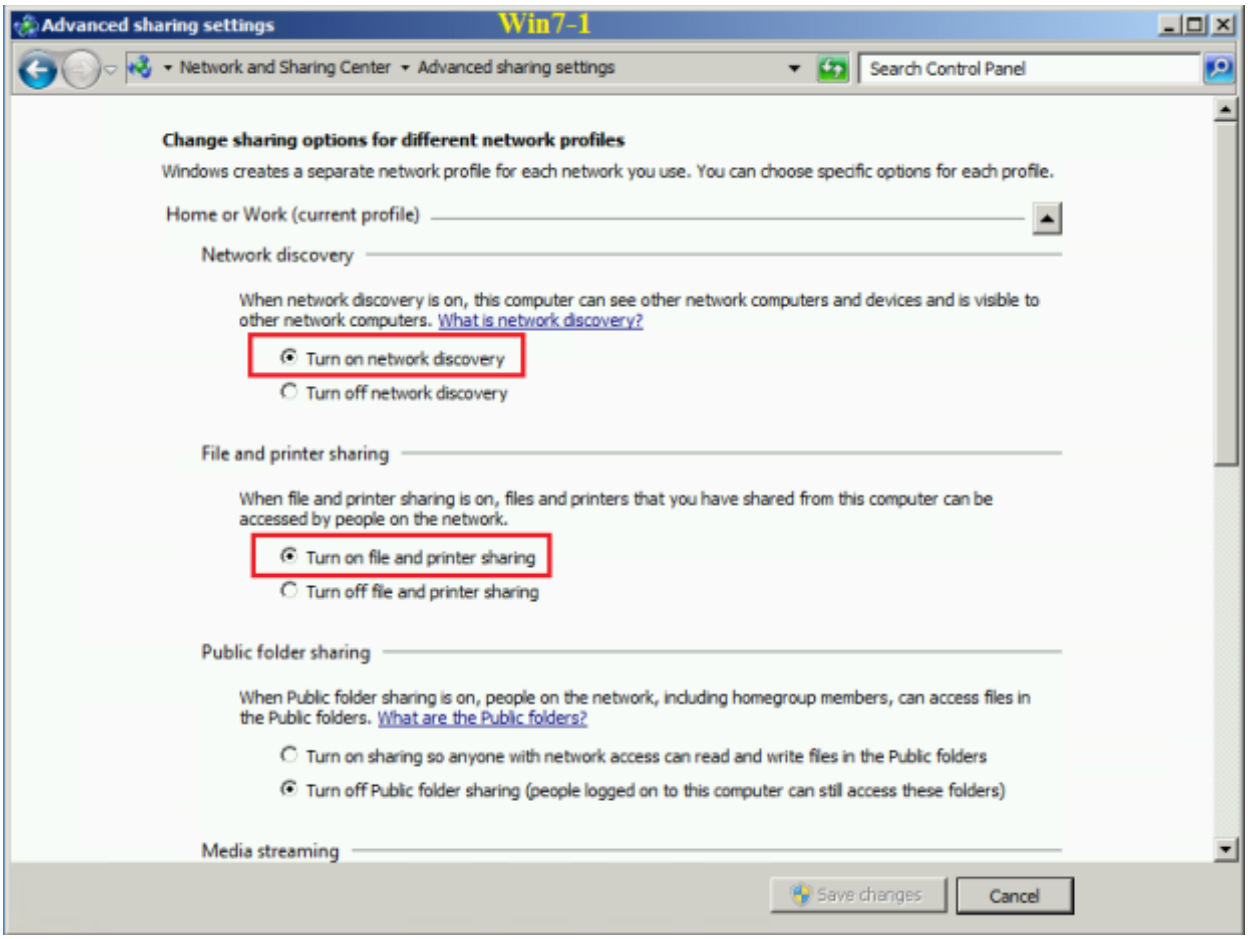
This seems a bit strange to me as the state of discovery services is the opposite to the enabled discovery options. What computers will I see in the Network with these default settings?

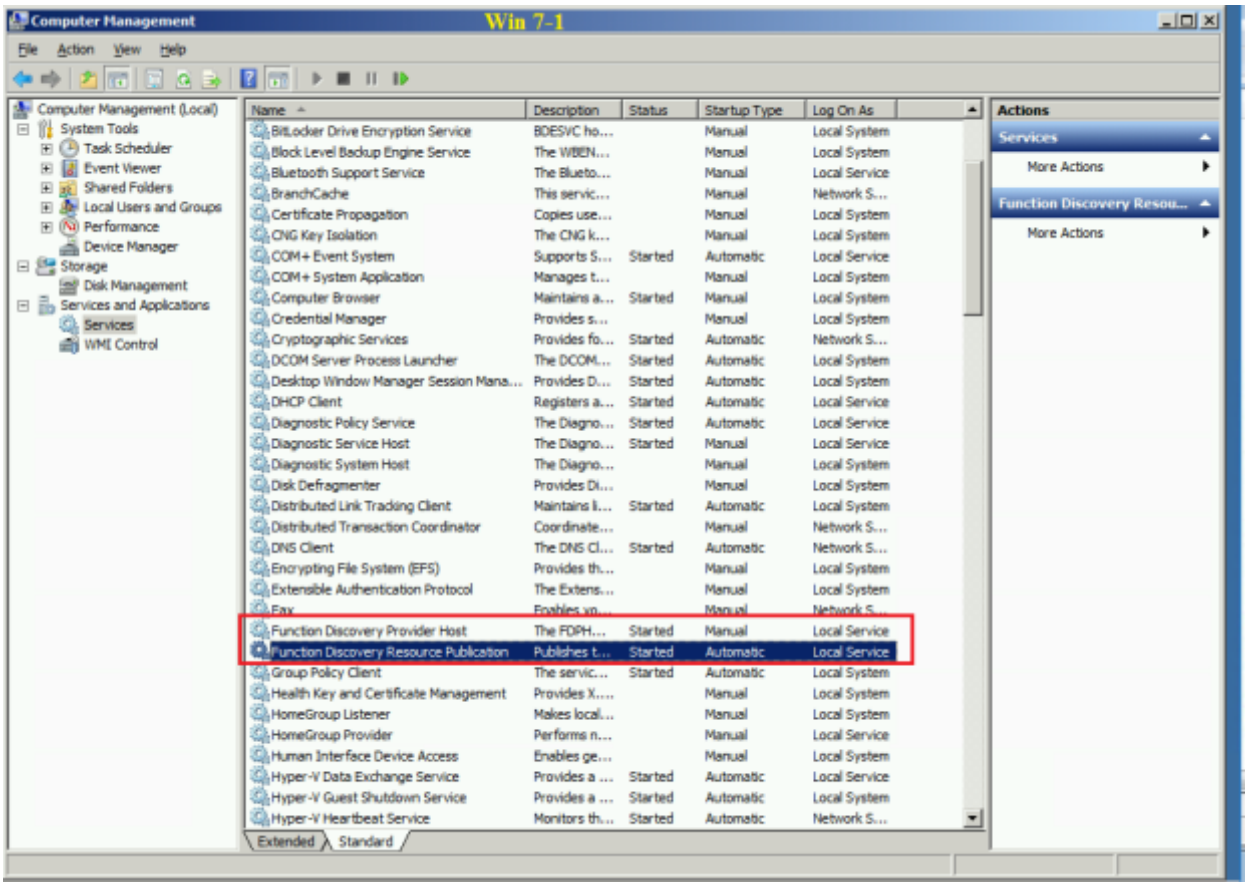


Win7-1 does see all computers on the network (except DC – it has its both discovery services stopped) BEFORE I click on *Turn on discovery and file sharing*! In fact this warning looks strange to me because enabling or disabling File sharing can NOT affect the ability to discover other network devices: as you've seen there are two distinct options and two diffrerent services responsible for this! After clicking *Turn on network discovery* … on this warning the network list remains the same:



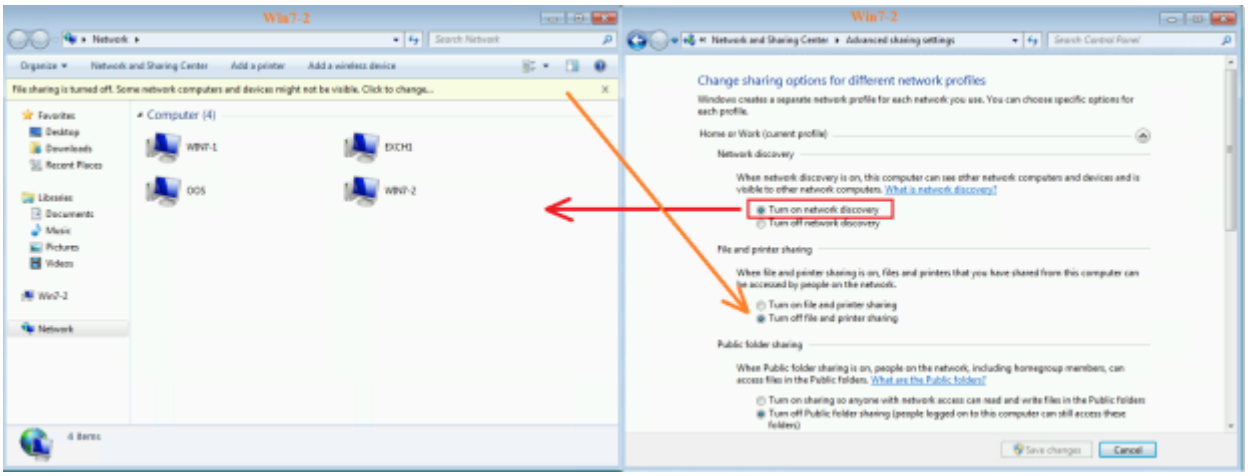
The result of turning on the File and printer sharing:



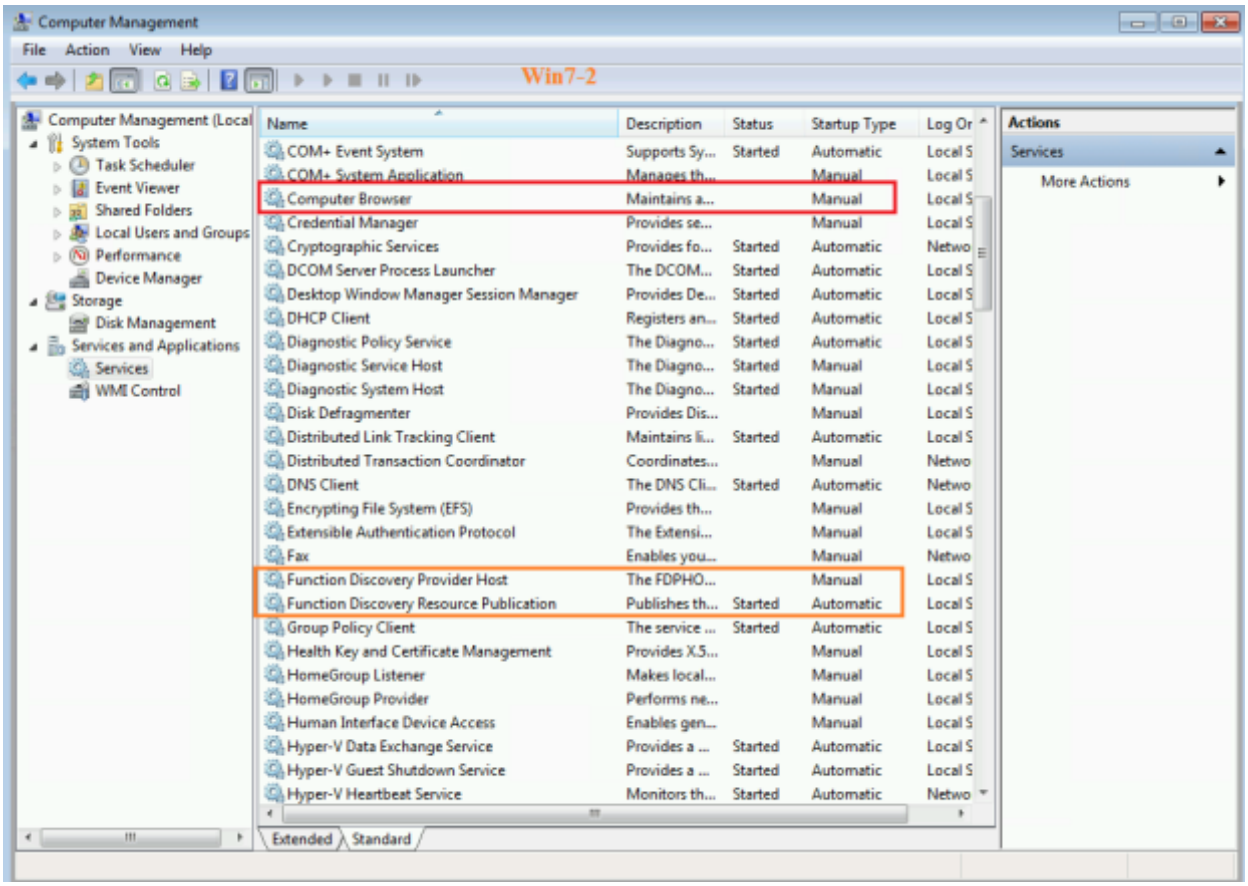


So turning on the *File and printer sharing* option has led to starting the *Function Discovery Provider Host* service (not the *Function Discovery Resource Publication* which had already been running!) Having that sad, a silly question arises: if it is the *Function Discovery Provider Host* service that's responsible for discovering network devices and it was stopped before I clicked on *Turn on network discovery* warning then by what means Win7-1 could have discovered all my network resources prior to this clicking??? The only suggestion that comes into my mind: in Windows 7 (!) the *Turn on network discovery* **option** ALONE is enough to discover network devices.

The following picture illustrates the same situation on Win7-2:

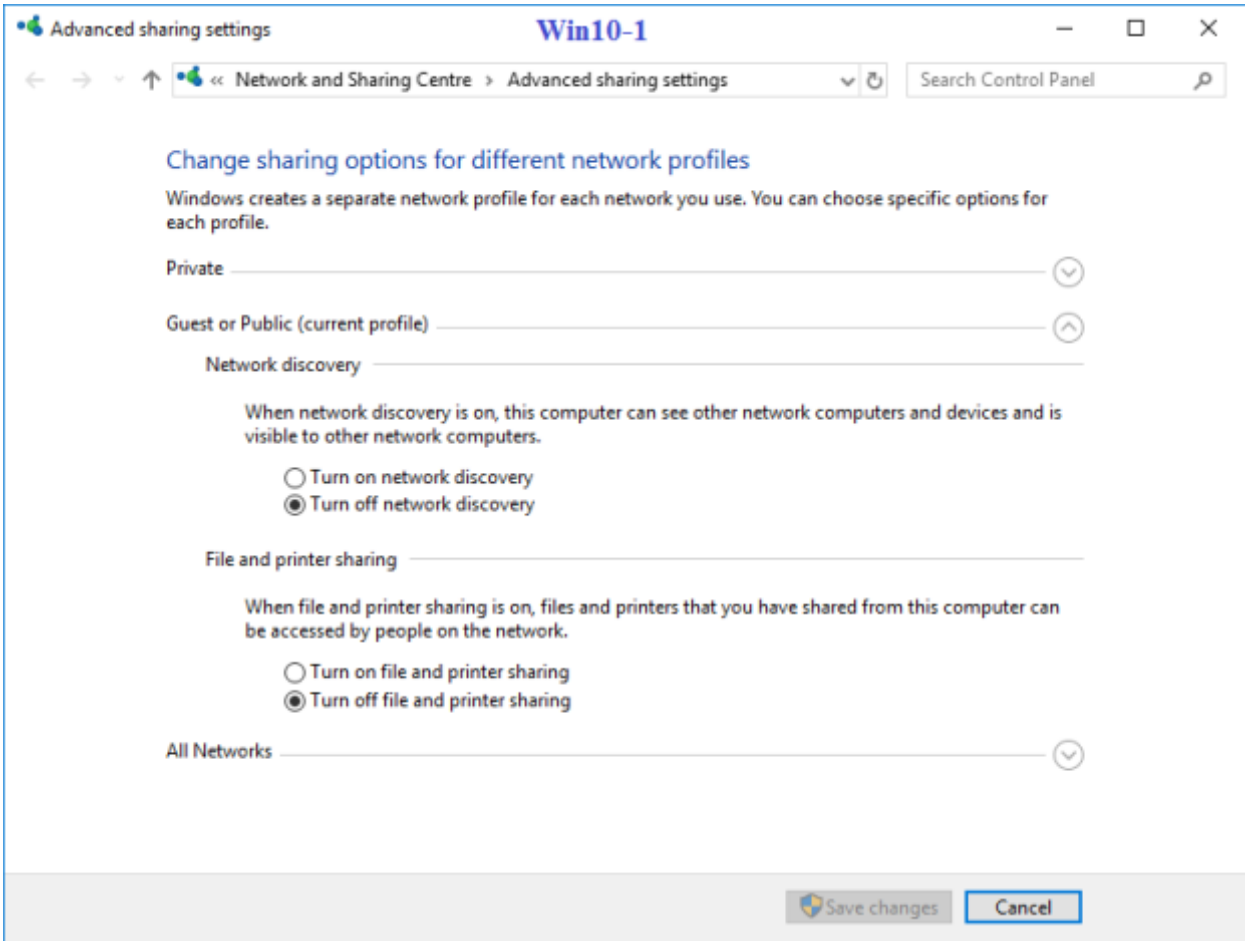


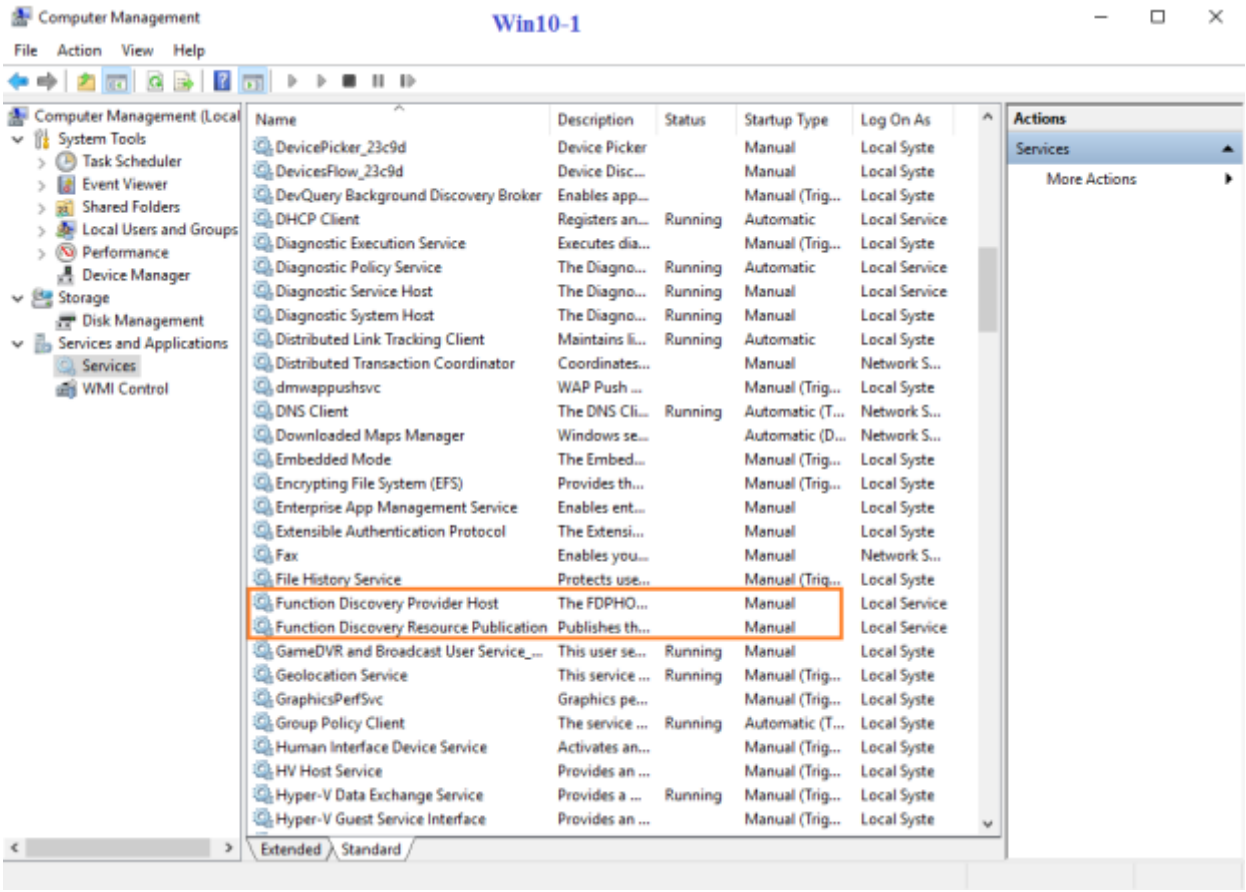
– all computers are already discovered because *Turn on network discovery* option is selected (but the *Function Discovery Provider Host* service is stopped!).



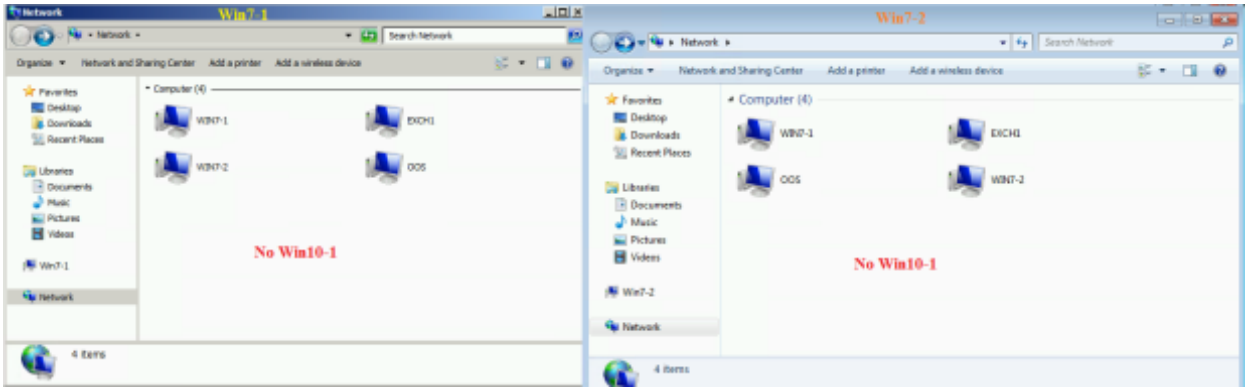
The next step is to deploy Win10-1 and Win10-2 workstations and find out what they see and publish in the Network by default. I'll start by installing Win10-1.

Right after installing the OS:

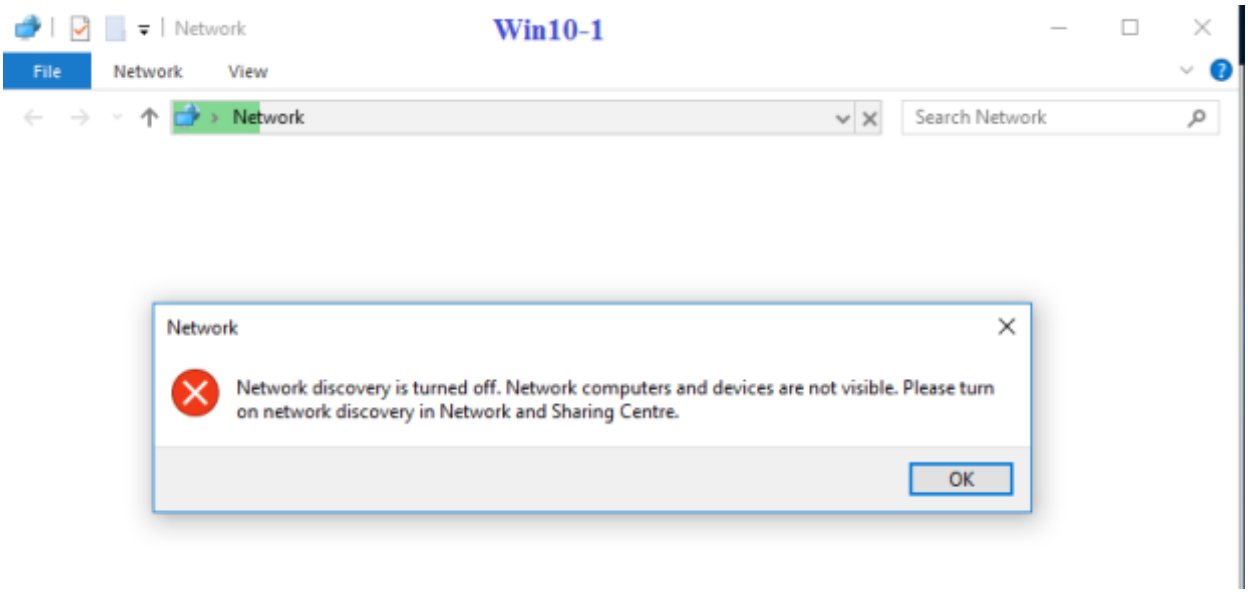

Advanced sharing settings
Win10-1
« Network and Sharing Centre › Advanced sharing settings
Search Control Panel
Change sharing options for different network profiles
Windows creates a separate network profile for each network you use. You can choose specific options for each profile.
Private
Guest or Public (current profile)
Network discovery
When network discovery is on, this computer can see other network computers and devices and is visible to other network computers.
Turn on network discovery
Turn off network discovery
File and printer sharing
When file and printer sharing is on, files and printers that you have shared from this computer can be accessed by people on the network.
Turn on file and printer sharing
Turn off file and printer sharing
All Networks
Save changes
Cancel


Computer Management
Win10-1
File Action View Help
Computer Management (Local
System Tools
Task Scheduler
Event Viewer
Shared Folders
Local Users and Groups
Performance
Device Manager
Storage
Disk Management
Services and Applications
Services
WMI Control
Name
Description
Status
Startup Type
Log On As
DevicePicker_23c9d
DevicesFlow_23c9d
DevQuery Background Discovery Broker
DHCP Client
Diagnostic Execution Service
Diagnostic Policy Service
Diagnostic Service Host
Diagnostic System Host
Distributed Link Tracking Client
Distributed Transaction Coordinator
dmwappushsvc
DNS Client
Downloaded Maps Manager
Embedded Mode
Encrypting File System (EFS)
Enterprise App Management Service
Extensible Authentication Protocol
Fax
File History Service
Function Discovery Provider Host
Function Discovery Resource Publication
GameDVR and Broadcast User Service_...
Geolocation Service
GraphicsPerfSvc
Group Policy Client
Human Interface Device Service
HV Host Service
Hyper-V Data Exchange Service
Hyper-V Guest Service Interface
Actions
Services
More Actions
Extended
Standard

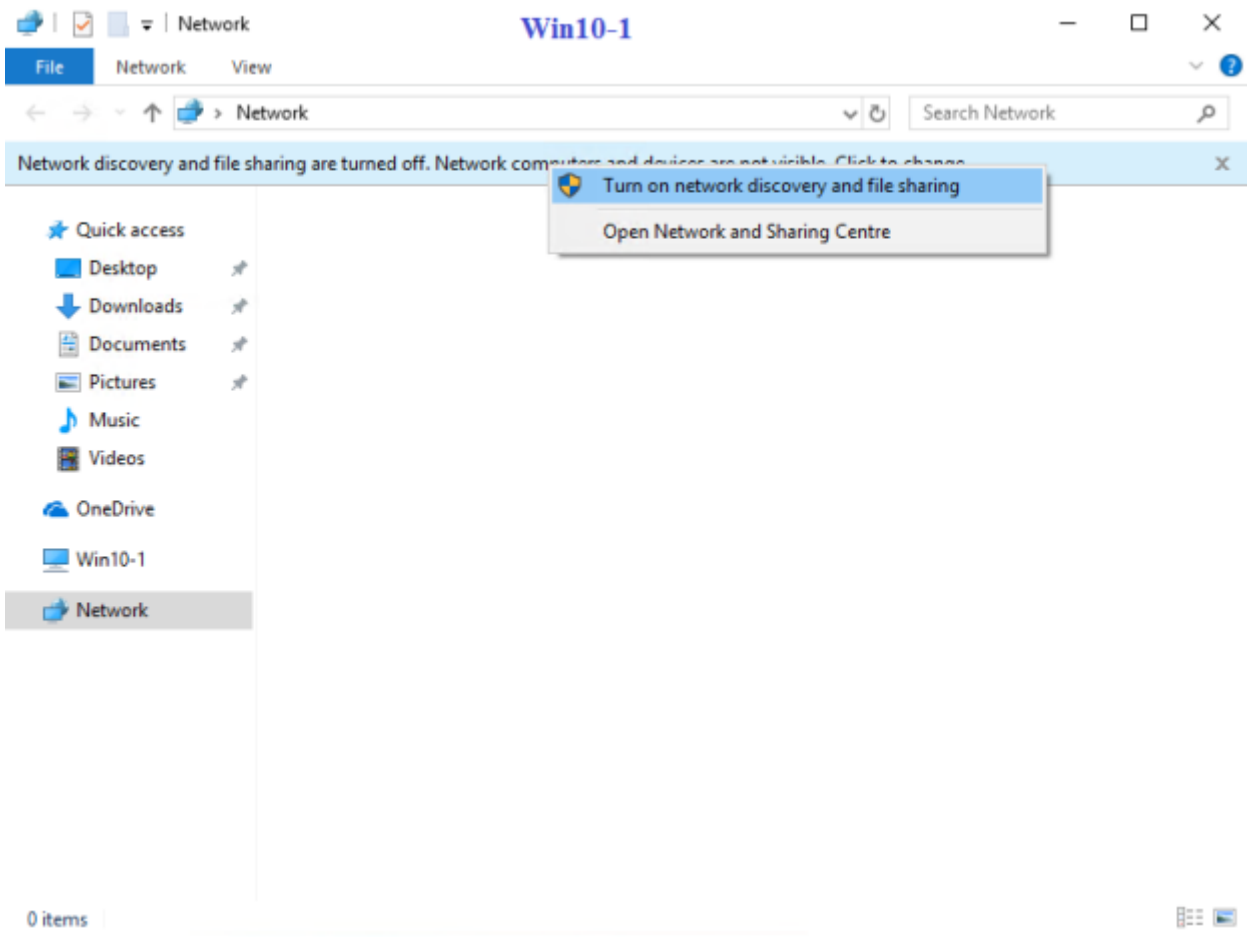
The first difference in the default settings: **Network discovery** is turned off and the second – both *Function Discovery* services are stopped. As a result neither both Win7 workstations see Win10-1 in the Network Neighborhood …

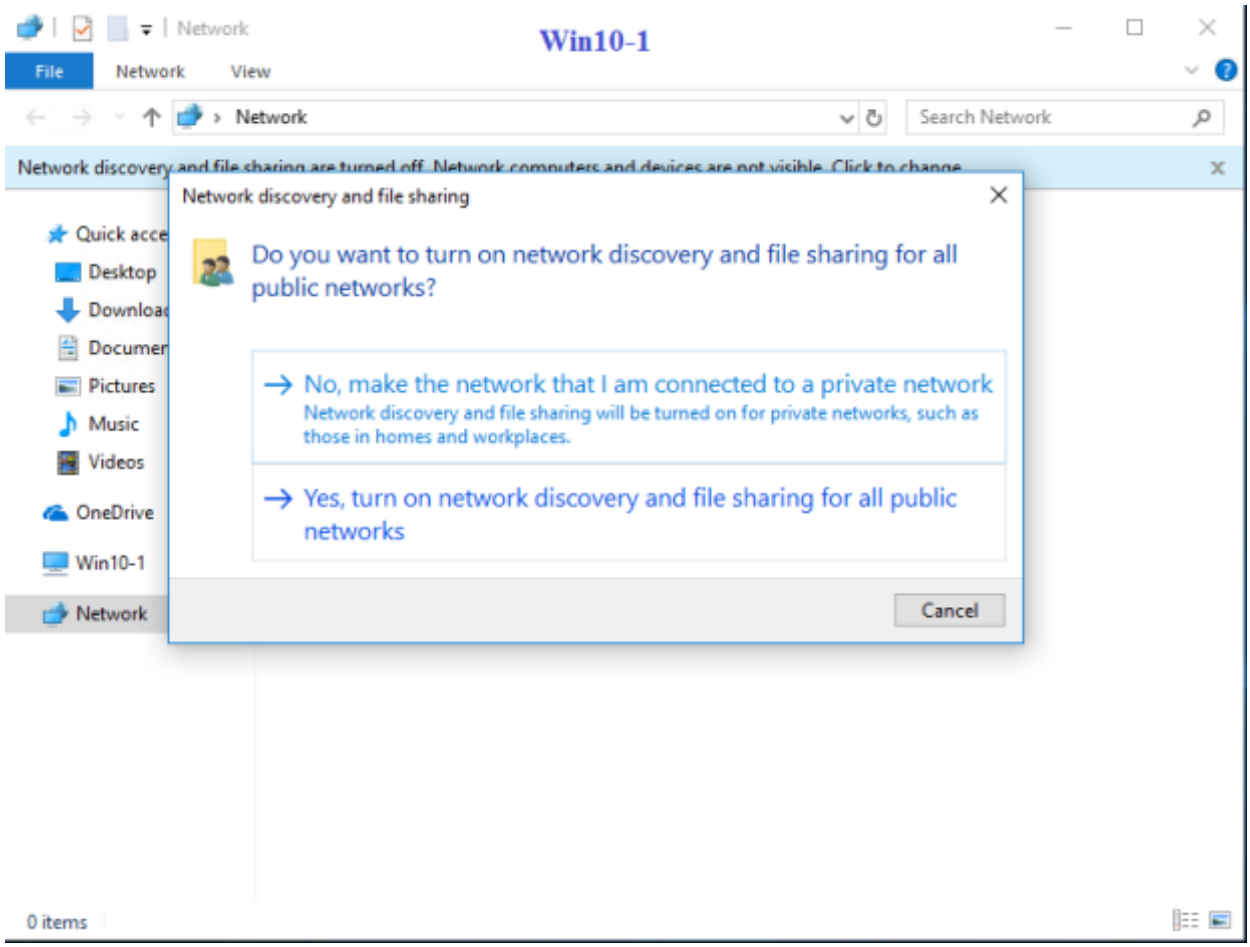


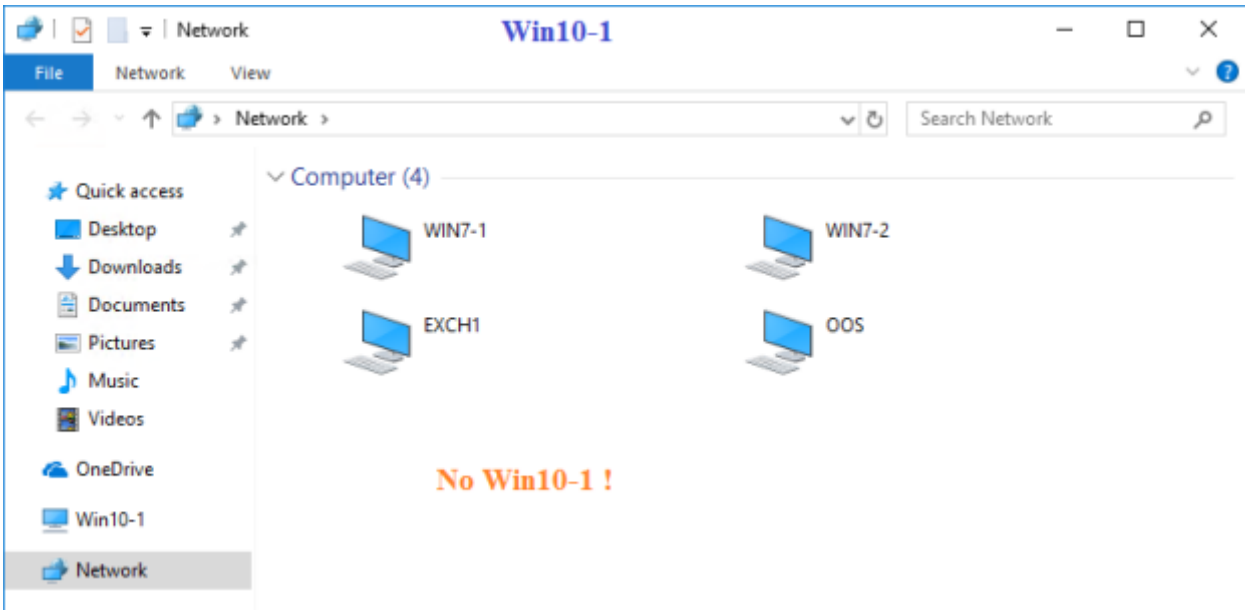
…nor Win10-1 sees itself in the Network folder:



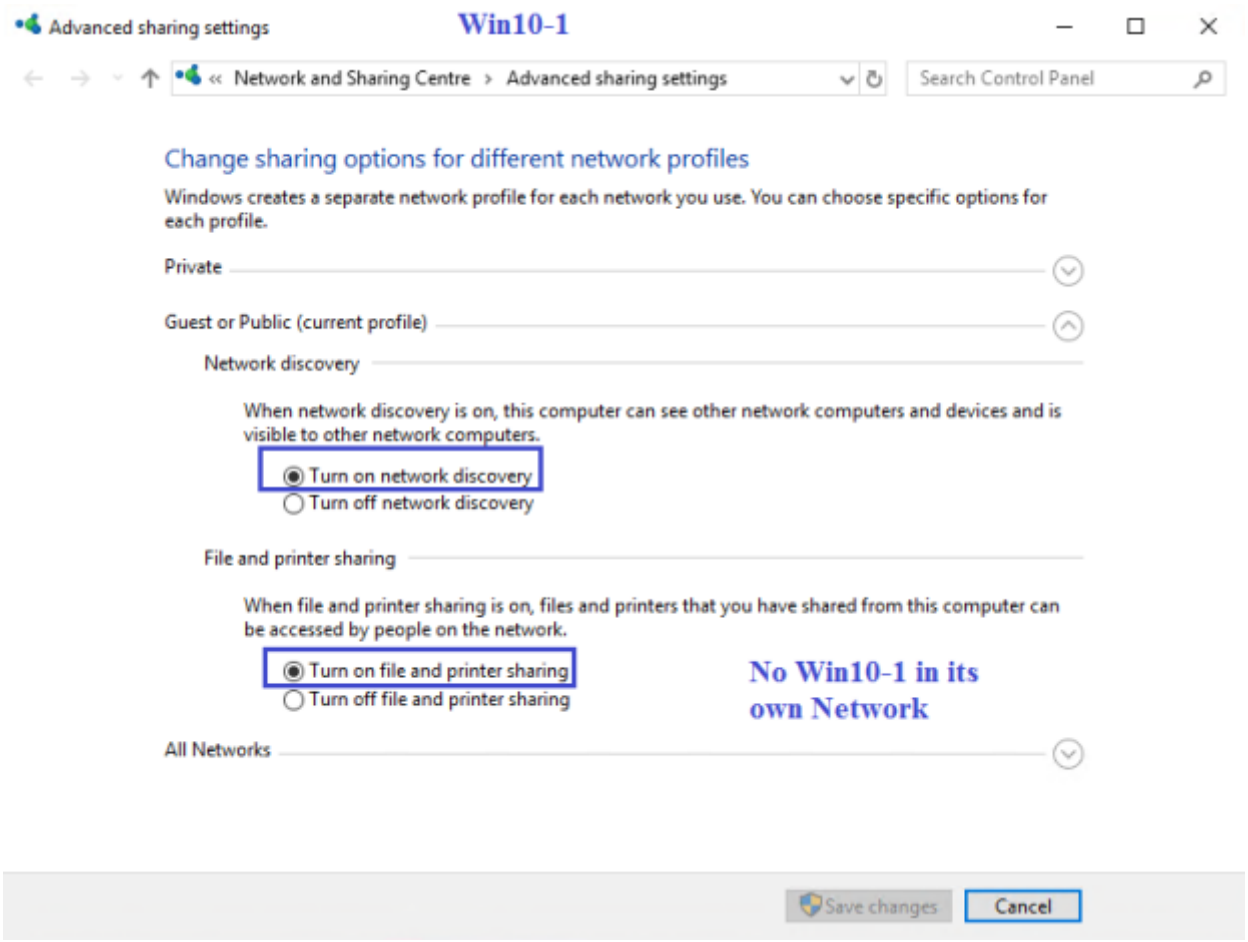
Now I'll click on *Turn on network discovery and file sharing are turned off*. …



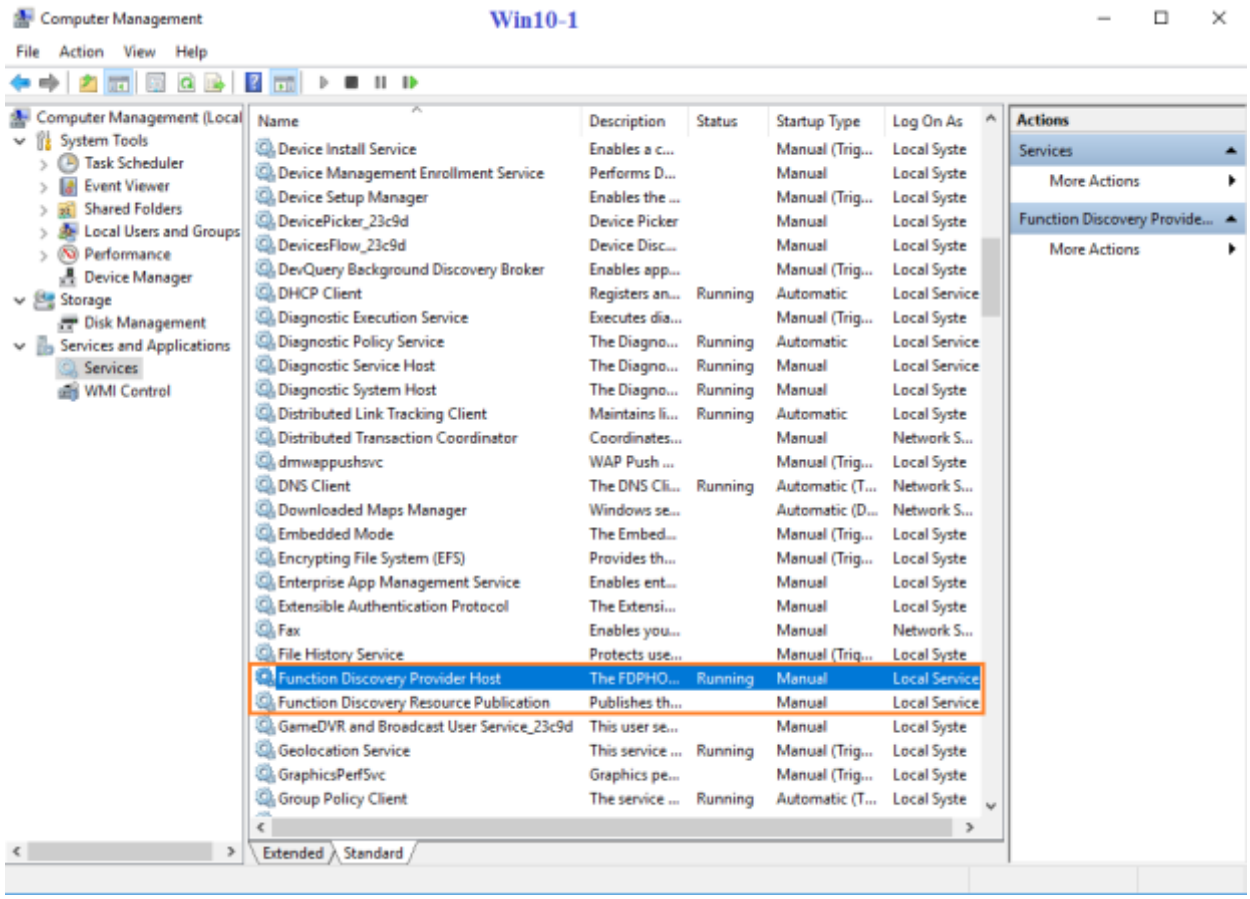




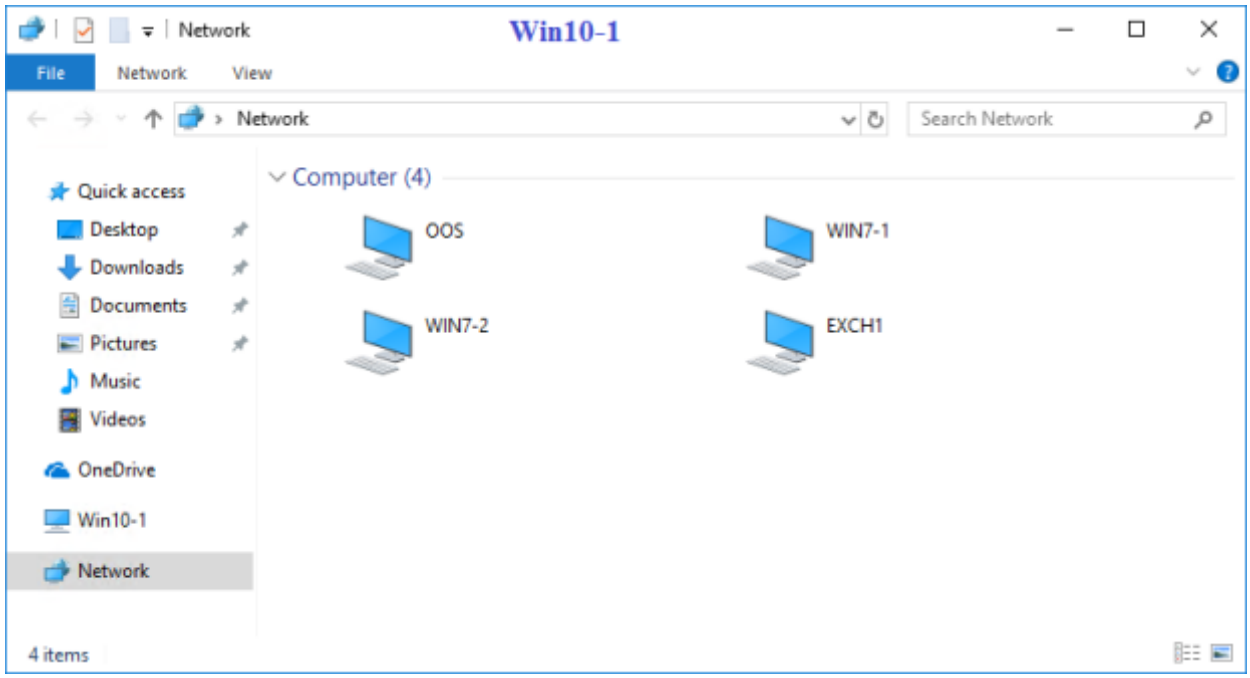
Win10-1 now can see other computers but don't see itself. Here's the advanced sharing configuration:



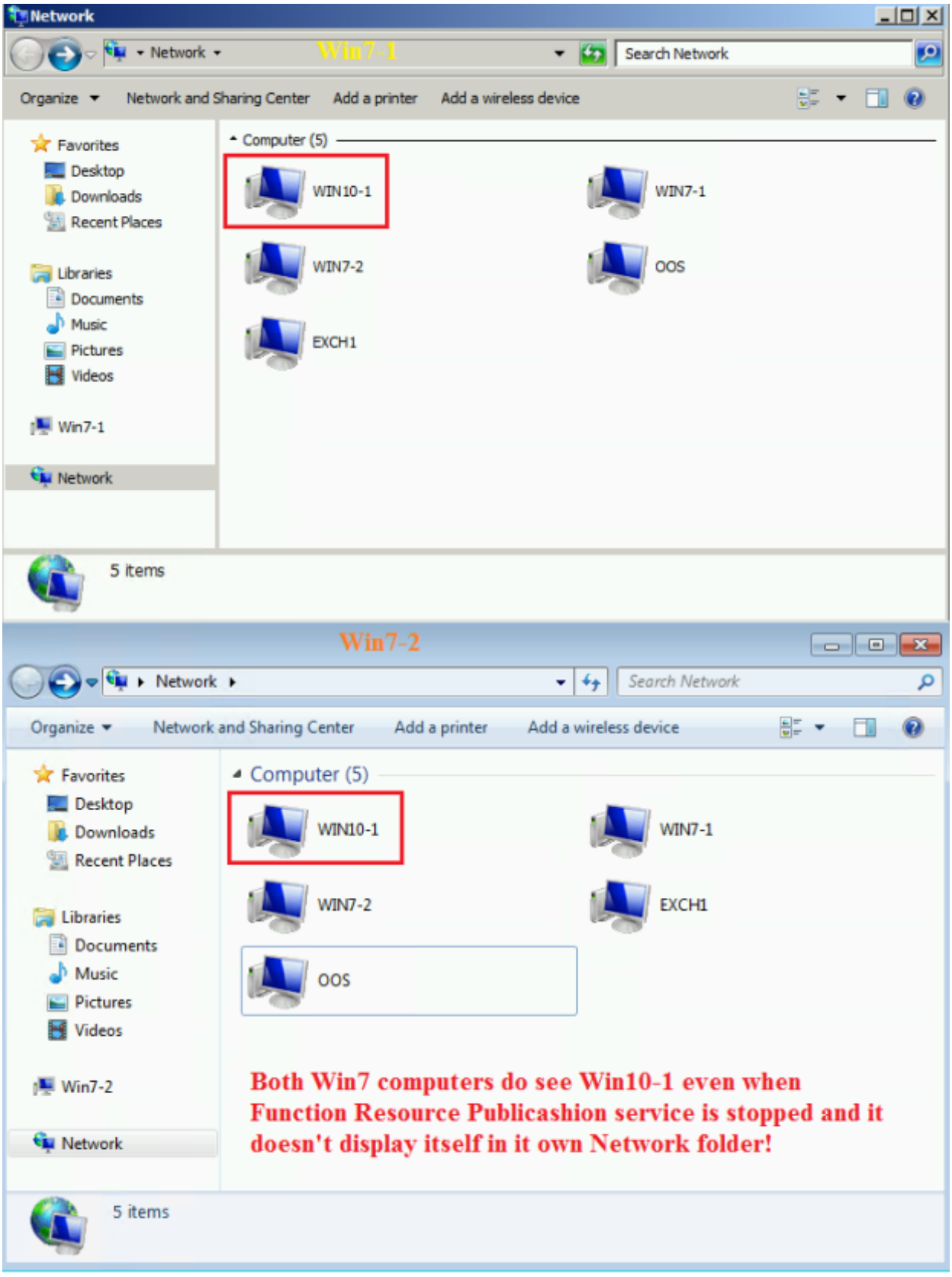
The services:



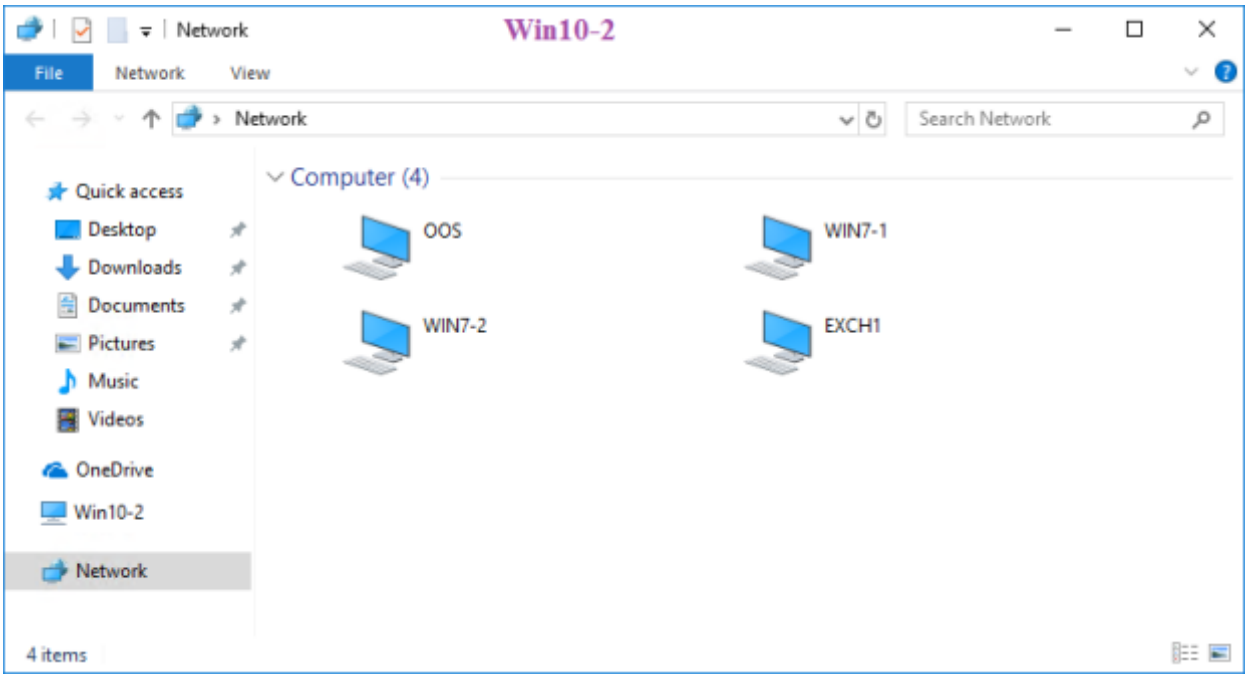
Recall that in Windows 7 the *Function Discovery Resource Publication* service was running right after OS installation and BEFORE turning on the *File and printer sharing* option – that's why Windows 7 computers were visible in Network Neighborhood without any user intervention. I think it would be pertinent to suggest that in contrast to Windows 7 computers, workstations with Windows 10 will not publish themselves until you manually start the *Function Discovery Resource Publication* service:



But if we switch to Win7-1 or Win7-2 consoles we'll see that both Windows 7 workstations do see Win10-1 in their Network Neighborhood:

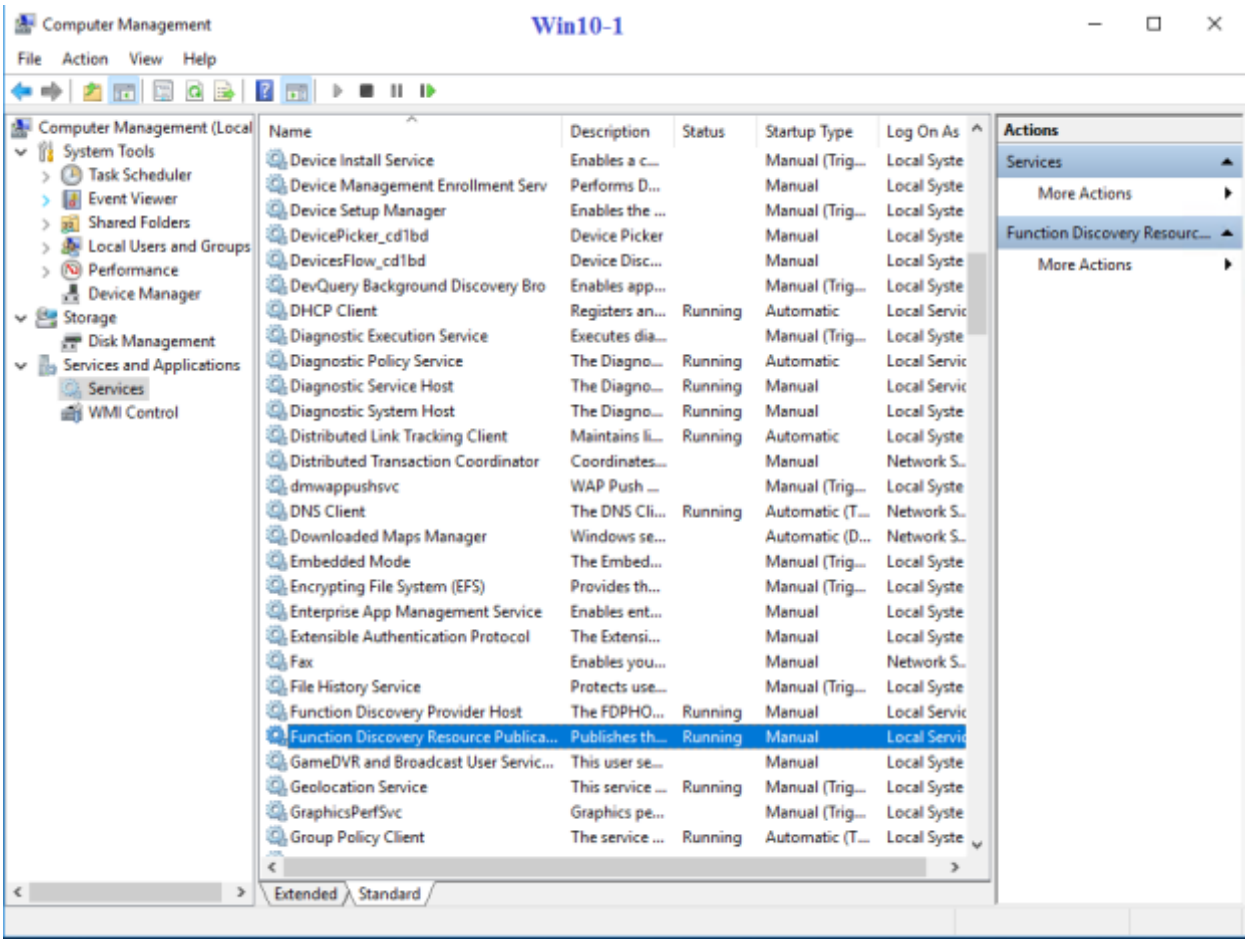


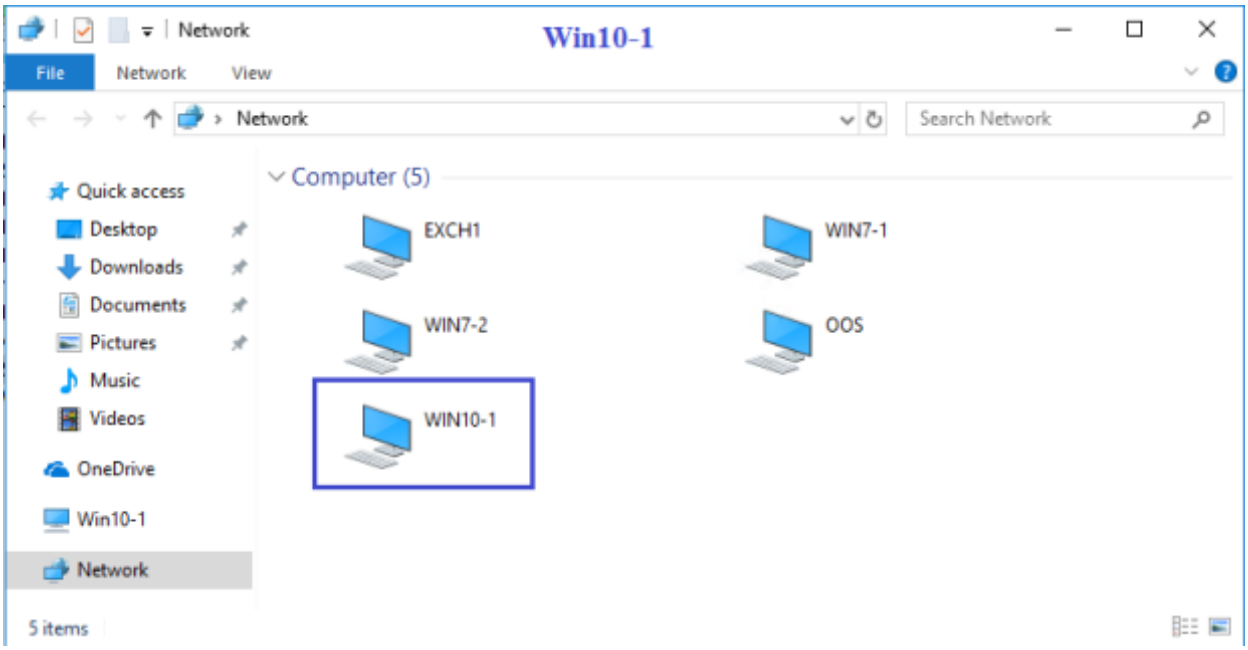
One more question: will another computer with Windows 10 (Win10-2) see its “sibling” in its Network? Here’s the screenshot taken from Win10-2 once it has booted up (after clicking on *Turn on network discovery*…):



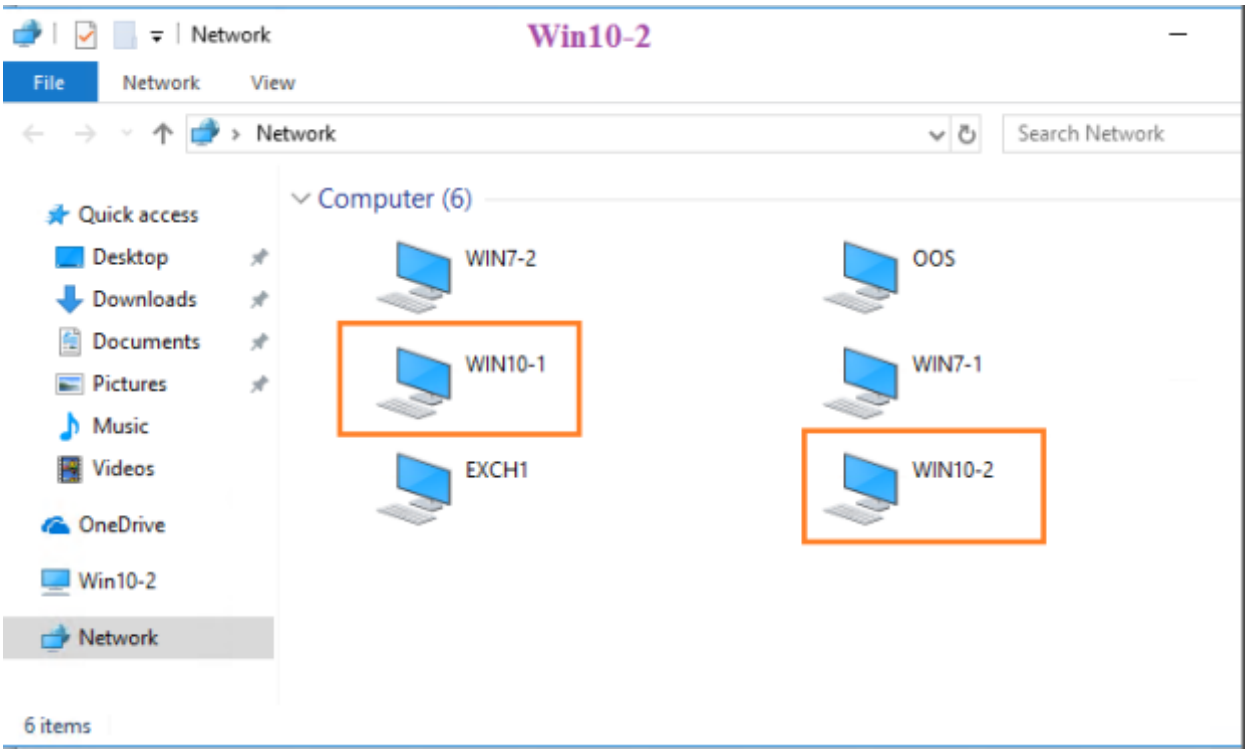
Apparently computers with Windows 10 can't see each other when the *Function Discovery Resource Publication* service is stopped: on contrary, Windows 7 computers can rely upon *Turn on file and printer sharing* option enabled.

After starting the *Function Discovery Resource Publication* service Win10-1 becomes visible in the Win10-1's (as well as in the Win10-2's) Network folder:

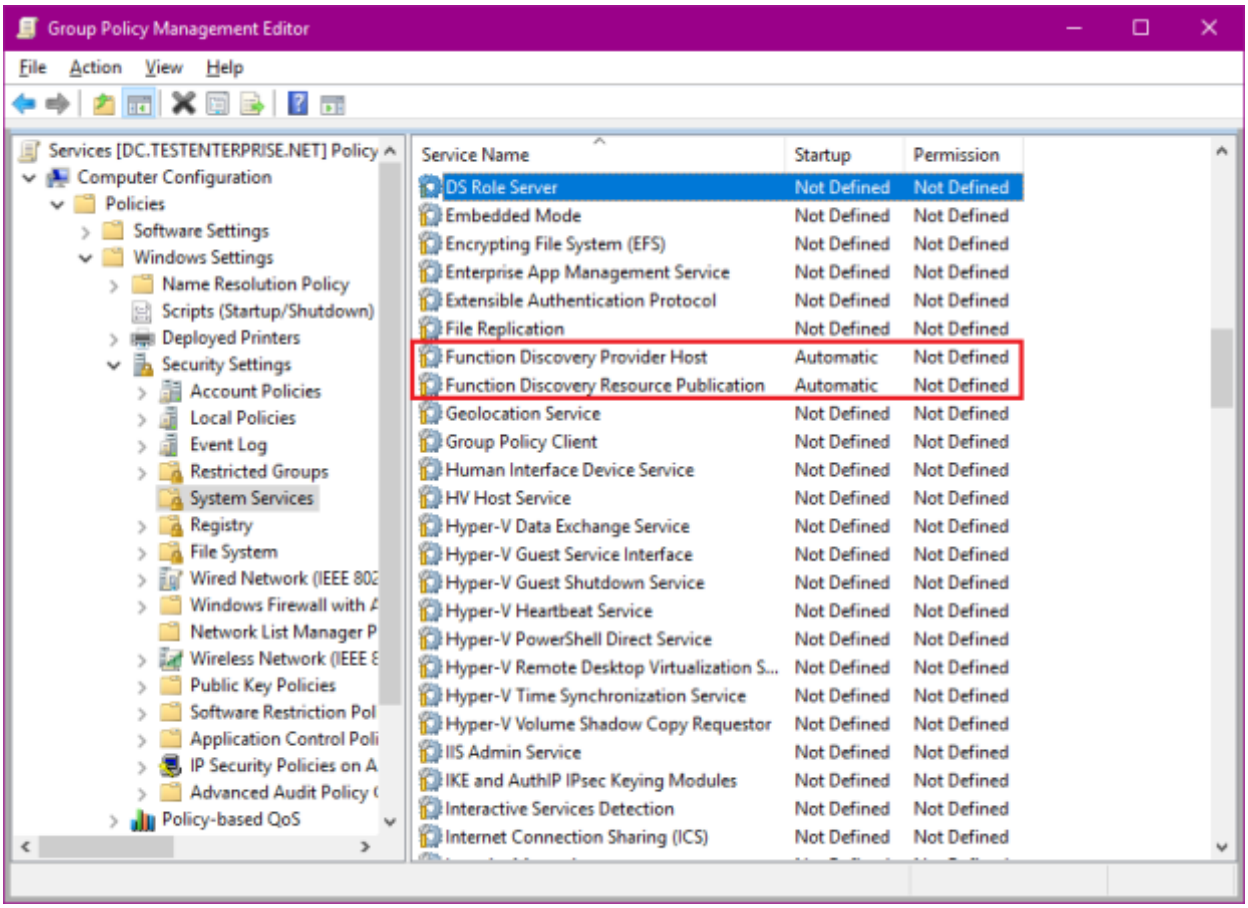




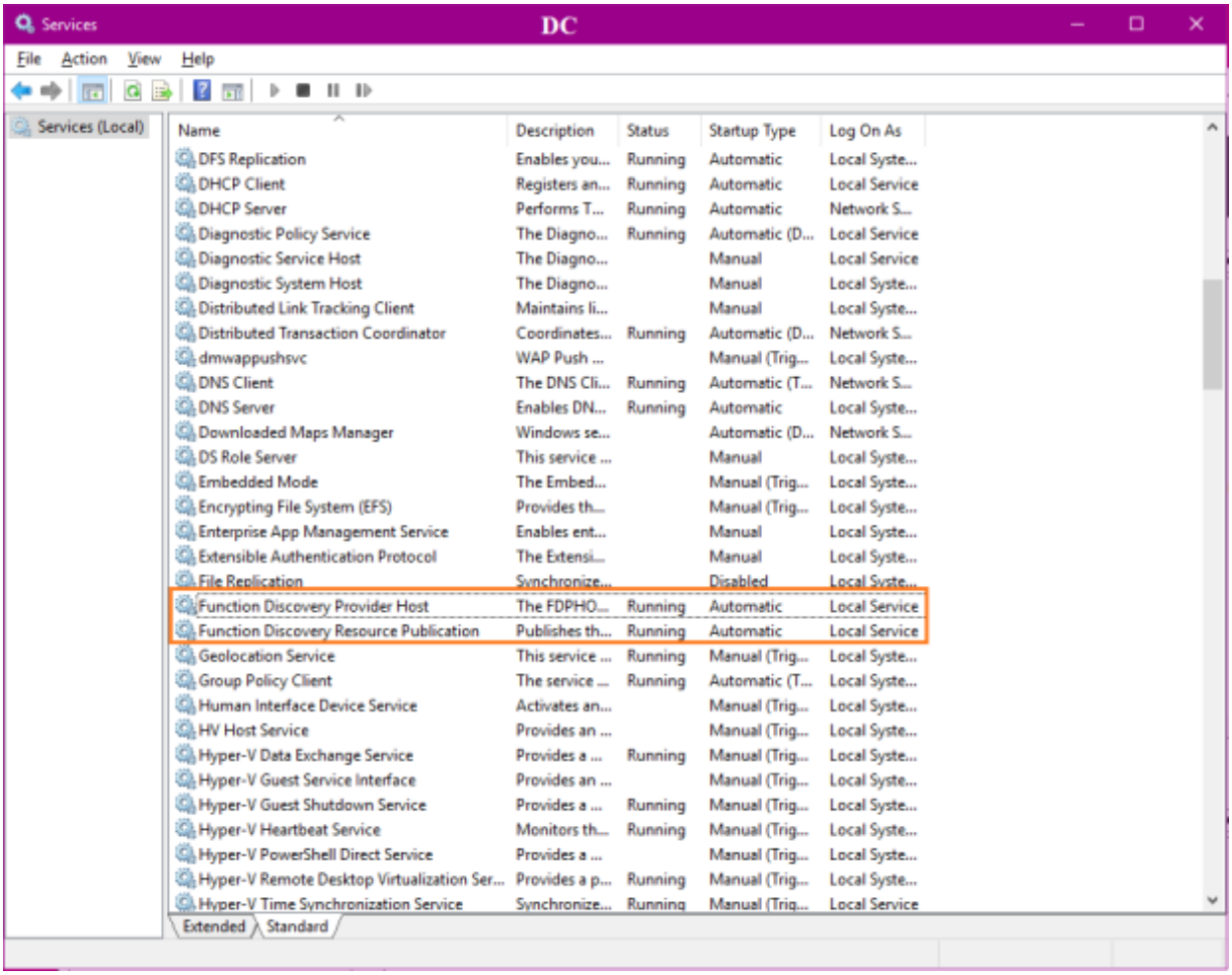
And after starting this service on Win10-2:

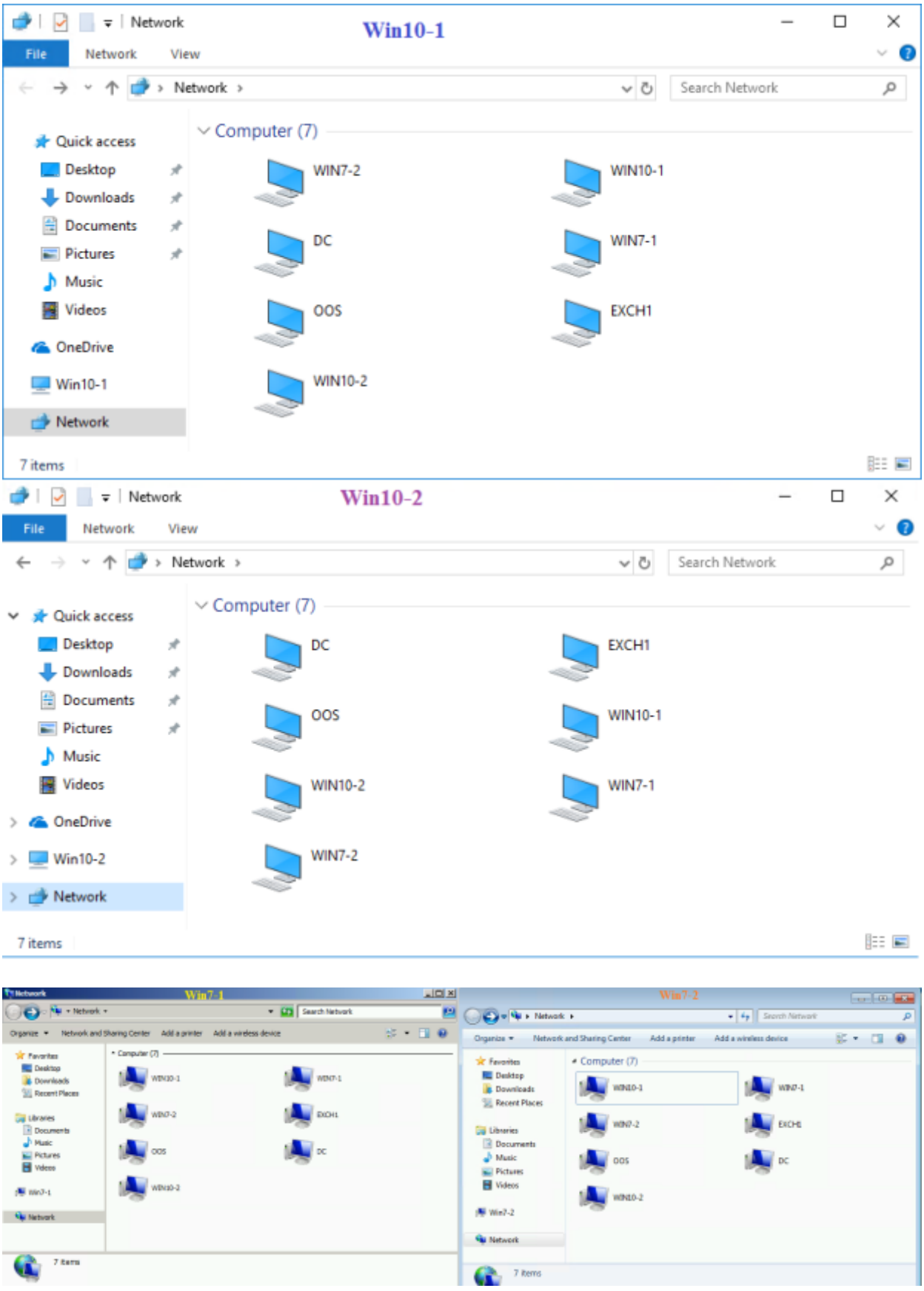


As per my understanding the key takeway here is this: if you want to see all computers in your Windows 7/10's Network folder it seems to be a good idea to create a GPO that would start the *Function Discovery Provider Host* and the *Function Discovery Resource Publication* services automatically (MS suggests to set them to Automatic Delayed start but there's no such an option in GPO):



The final network view from all client computers when the GPO has been applied to DC:





There's one more interesting fact I'd like to mention: right before applying the GPO wich would set the both Function Discovery services startup type to Automatic – by that time my virtual machines were idle for about a couple of hours – I noticed that the *Function Discovery Resource Publication* service on Win10-2 had stopped thus making it to disappear from Win10-1's and Win10-2's Network folder, so you should be aware that

after some time of inactivity this service – when its startup type is set to Manual – may change its state to stopped (probably it also applies to the the *Function Discovery Provider Host* service). Anyway, setting these two services to Automatic startup type should help avoid any ambiguity in the Network folder's content.

Summary:

It's possible to mantain a complete list of network devices on Windows7-Windows 10 networks using WS-DISCOVERY protocol only. From my point of view the behaviour of Windows 10 computers (both discovery and resource publication) is more predictable then that of Window 7 clients. Setting the startup type of the *Function Discovery Provider Host* and the *Function Discovery Resource Publication* services to Automatic by any means (for example via GPO) will guarantee all network devices appear in each and every computer's Network folder.