Managed Service Accounts: Understanding, Implementing, Best Practices, and Troubleshooting

One of the more interesting new features of Windows Server 2008 R2/Server 2012 and Windows 7/8is Managed Service Accounts. MSA's allow you to create an account in Active Directory that is tied to a specific computer. That account has its own complex password and is maintained automatically. This means that an MSA can run services on a computer in a secure and easy to maintain manner, while maintaining the capability to connect to network resources as a specific user principal.

Today I will:

- Describe how MSA works
- Explain how to implement MSA's
- Cover some limitations of MSA's
- Troubleshoot a few common issues with MSA's

Let's be about it.

How Managed Service Accounts Work

The Windows Server 2008 R2 AD Schema introduces a new object class called ***msDS-ManagedServiceAccount***. Create an MSA, examine its *objectClass* attribute, and notice the object has an interesting object class inheritance structure:

```
Computer
msDS-ManagedServiceAccount
organizationalPerson
Top
User
```

The object is a user *and* a computer at the same time, just like a computer account. But it does not have an object class of ***person*** like a computer account typically would; instead it has ***msDS-ManagedServiceAccount***. MSA's inherit from a parent object class of "Computer", but they are also users. MSA objects do not contain new attributes from the Win2008 R2 schema update.

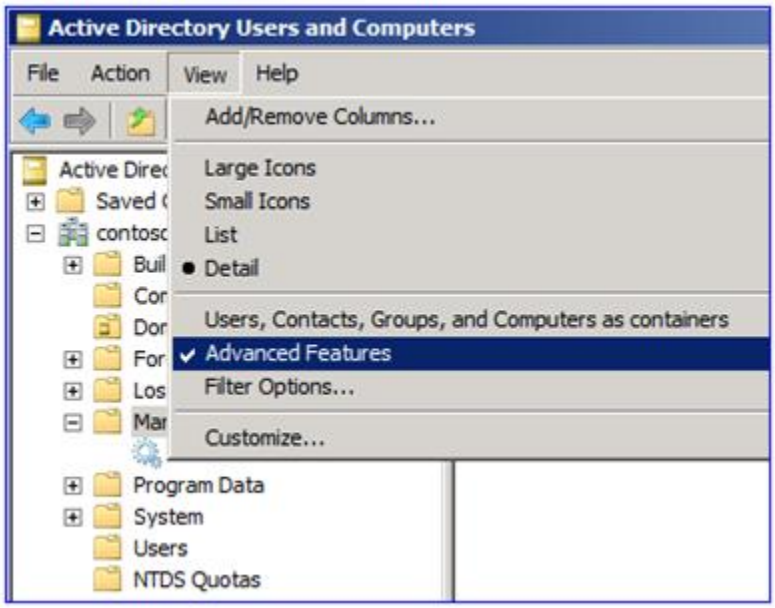
And this leads me to how MSA's handle passwords – it's pretty clever. An MSA is a quasi-computer object that utilizes the same password update mechanism used by computer objects. So, the MSA account password is updated when the computer updates its password (every 30 days by default). This can be controlled - just like a computer's password - with the following two DWORD values:

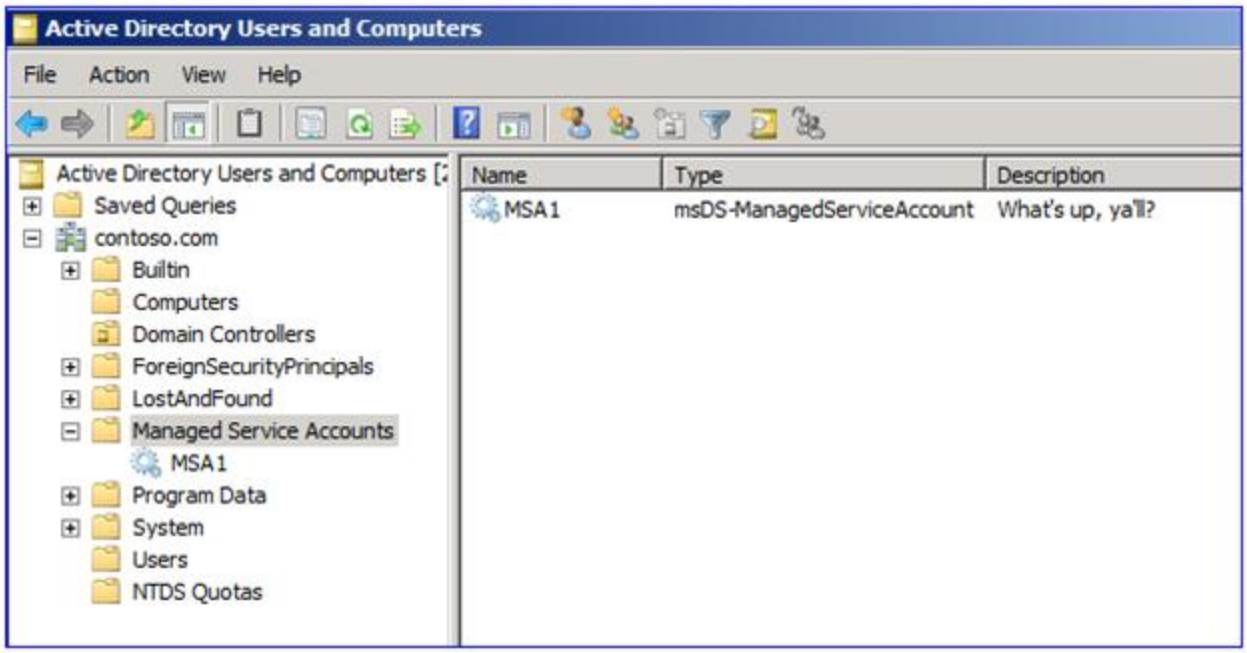
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\NetLogon\Parameters

`DisablePasswordChange` = [0 or 1, default if value name does not exist is 0]
`MaximumPasswordAge` = [1-1,000,000 in days, default if value name does not exist is 30]

MSA's, like computers, do not observe domain or fine-grained password policies. MSA's use a complex, automatically generated password (240 bytes, which is 120 characters, and cryptographically random). MSA's cannot be locked out, and cannot perform interactive logons. Administrators can set an MSA password to a known value, although there's ordinarily no justifiable reason (and they can be reset on demand; more on this later).

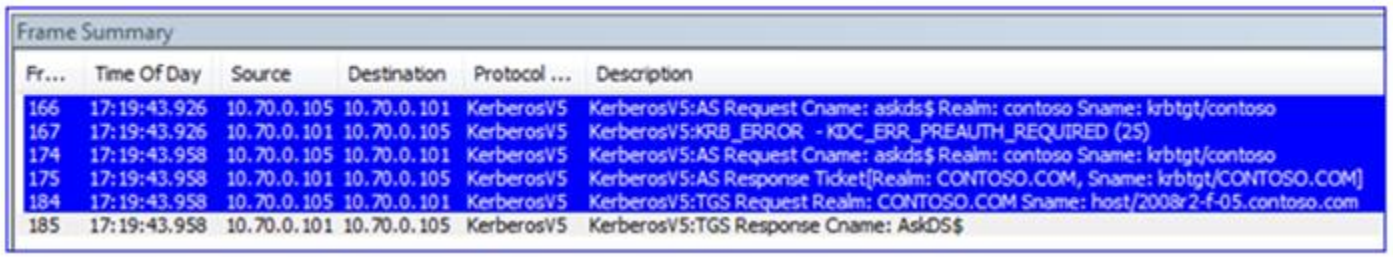
All Managed Service Accounts are created (by default) in the new ***CN=Managed Service Accounts, DC=<domain>, DC=<com>*** container. You can see this by configuring **DSA.MSC** to show "Advanced Features":

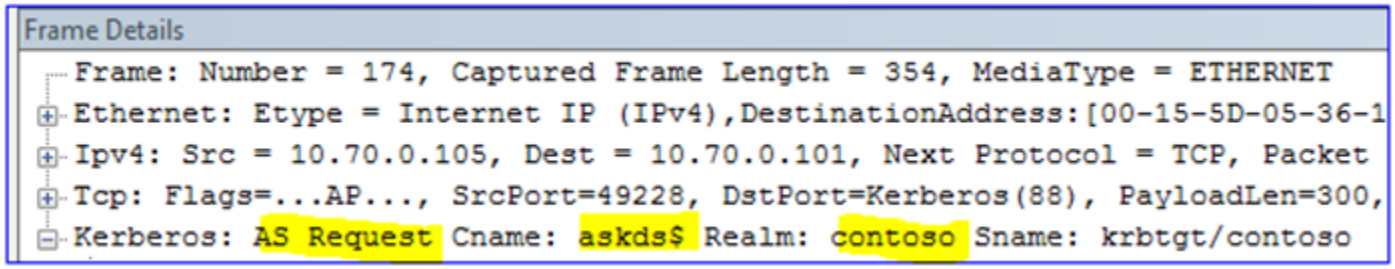




As you will see later though, there isn't much point to looking at this in **AD Users and Computers** because… wait for it… all your administration will be done through **PowerShell**. You knew that was coming, didn't you?

MSA's automatically maintain their Kerberos Service Principal Names (SPN), are linked to one computer at a time, and support delegation. A network capture shows a correctly configured MSA using Kerberos:





Implementing MSA's

Forest and OS Requirements

To use MSAs you must:

- Use Active Directory
- Extend your AD schema to Windows Server 2008 R2
- Host services using MSAs on Windows Server 2008 R2/2012 and Windows 7/8 computers (MSAs cannot be installed on down-level operating systems)
- PowerShell, AD PowerShell (part of the RSAT), and the .Net 3.5x framework enabled on any computers using or configuring MSAs

MSAs do not require a specific Forest Functional Level, but there is a scenario where *part* of MSA fucntionality requires a Windows Server 2008 Domain Fcuntional Level. This means:

- If your domain is Windows Server 2008 R2 functional level, automatic passwords *and* SPN management will work
- If your domain is *less* than WIndows Server 2008 R2 Domain Functional Level, automatic passwords will work. Automatic SPN management will *not* work, and SPN's will have to be maintained by administrators

Deployment

Using a new MSA always works in four steps:

1. You create the MSA in AD.

2. You associate the MSA with a computer in AD.

3. You install the MSA on the computer that was associated.

4. You configure the service(s) to use the MSA.

We begin by using PowerShell to create the new MSA in Active Directory. You can run this command on Windows Server 2008 R2 or Windows 7 computer that has the RSAT feature "Active Directory Module for Windows PowerShell" enabled. Perform all commands as an administrator.

1. Start **PowerShell**.

2. Import the AD module with:

```
Import-Module ActiveDirectory
```

3. Create an MSA with:

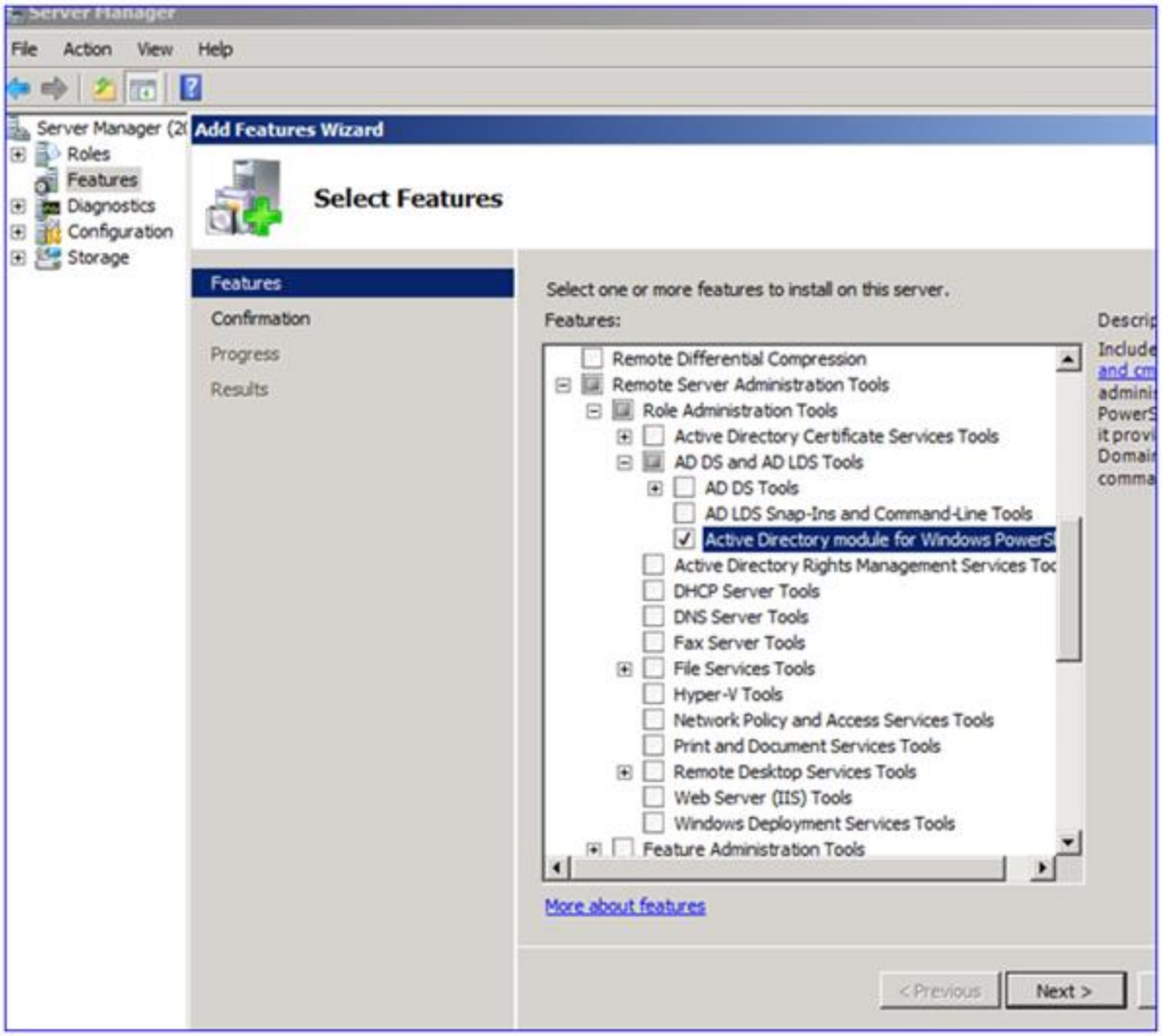
```
New-ADServiceAccount -Name <some new unique MSA account name> -Enabled $true
```

4. Associate the new MSA with a target computer in Active Directory:

```
Add-ADComputerServiceAccount -Identity <the target computer that needs an MSA> -
ServiceAccount <the new MSA you created in step 3>
```

5. Now logon to the target computer where the MSA is going to be running. Ensure the following features are enabled:

- Active Directory Module for Windows PowerShell
- .NET Framework 3.5.1 Feature


Server Manager
File Action View Help
Server Manager (2
Roles
Features
Diagnostics
Configuration
Storage
Add Features Wizard
Select Features
Features
Confirmation
Progress
Results
Select one or more features to install on this server.
Features:
Remote Differential Compression
Remote Server Administration Tools
Role Administration Tools
Active Directory Certificate Services Tools
AD DS and AD LDS Tools
AD DS Tools
AD LDS Snap-Ins and Command-Line Tools
Active Directory module for Windows PowerS
Active Directory Rights Management Services Too
DHCP Server Tools
DNS Server Tools
Fax Server Tools
File Services Tools
Hyper-V Tools
Network Policy and Access Services Tools
Print and Document Services Tools
Remote Desktop Services Tools
Web Server (IIS) Tools
Windows Deployment Services Tools
Feature Administration Tools
More about features
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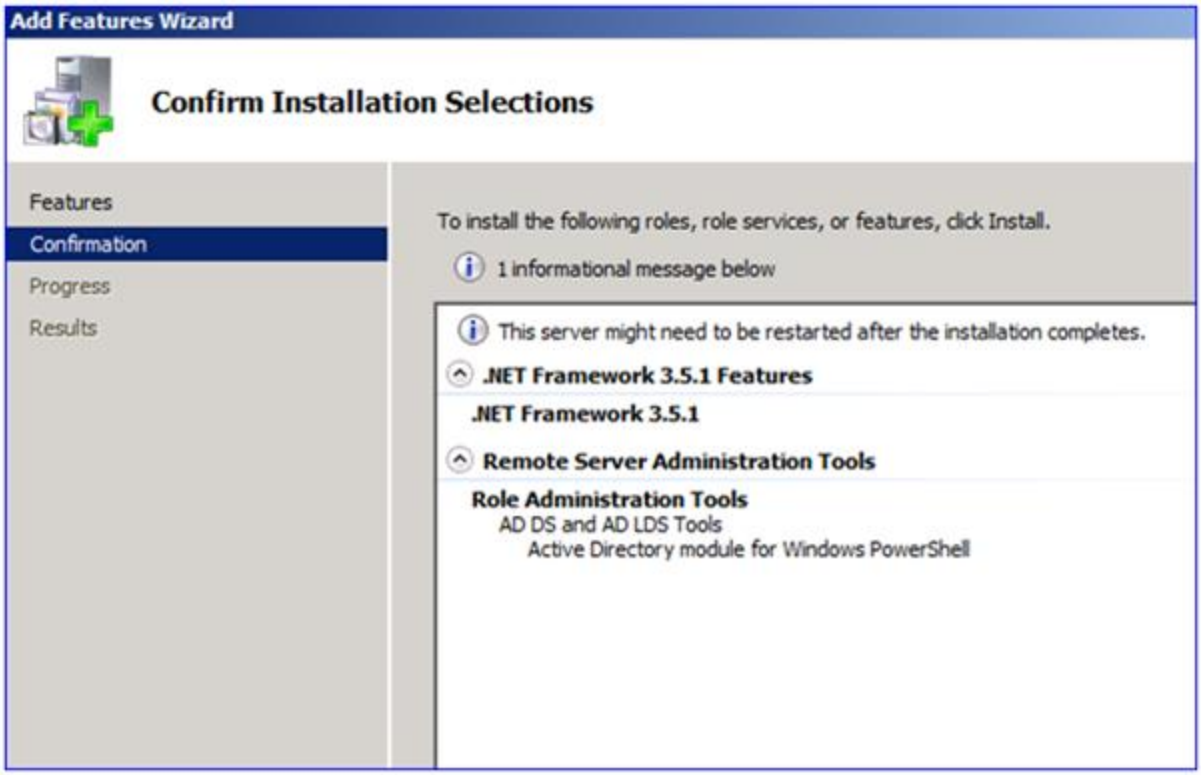
Next >



6. Start **PowerShell**.

7. Import the AD module with:

```
Import-Module ActiveDirectory
```

8. Install the MSA with:

```
Install-ADServiceAccount -Identity <the new MSA you created in step 3>
```

Note: Besides being a local administrator on the computer, the account installing the MSA needs to have permissions to modify the MSA in AD. If a domain admin this "just works"; otherwise, you would need to delegate modify permissions to the service account's AD object.

9. Now you can associate the new MSA with your service(s).

The GUI way:

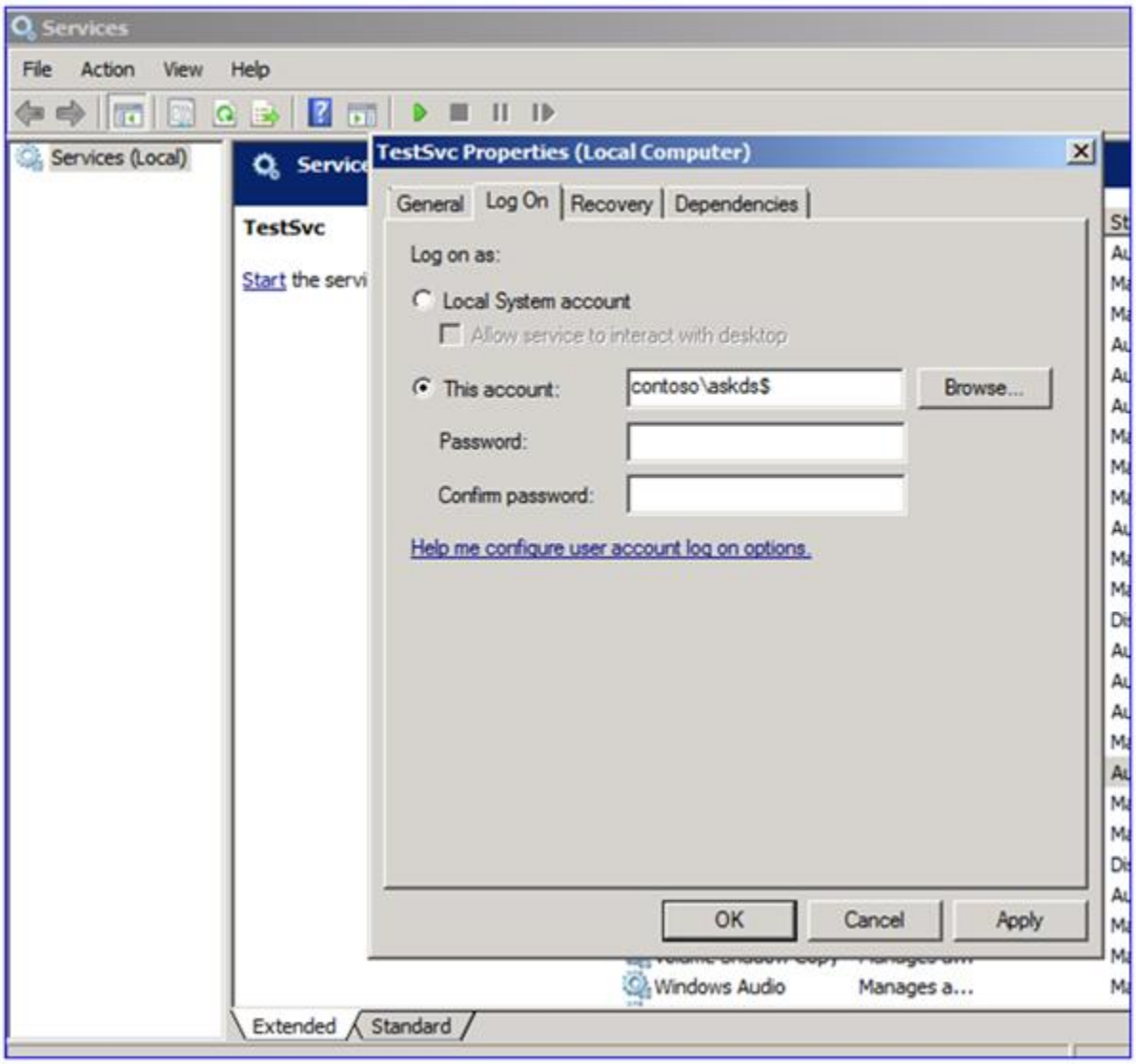
a. Start **services.msc**.

b. Edit your service properties.

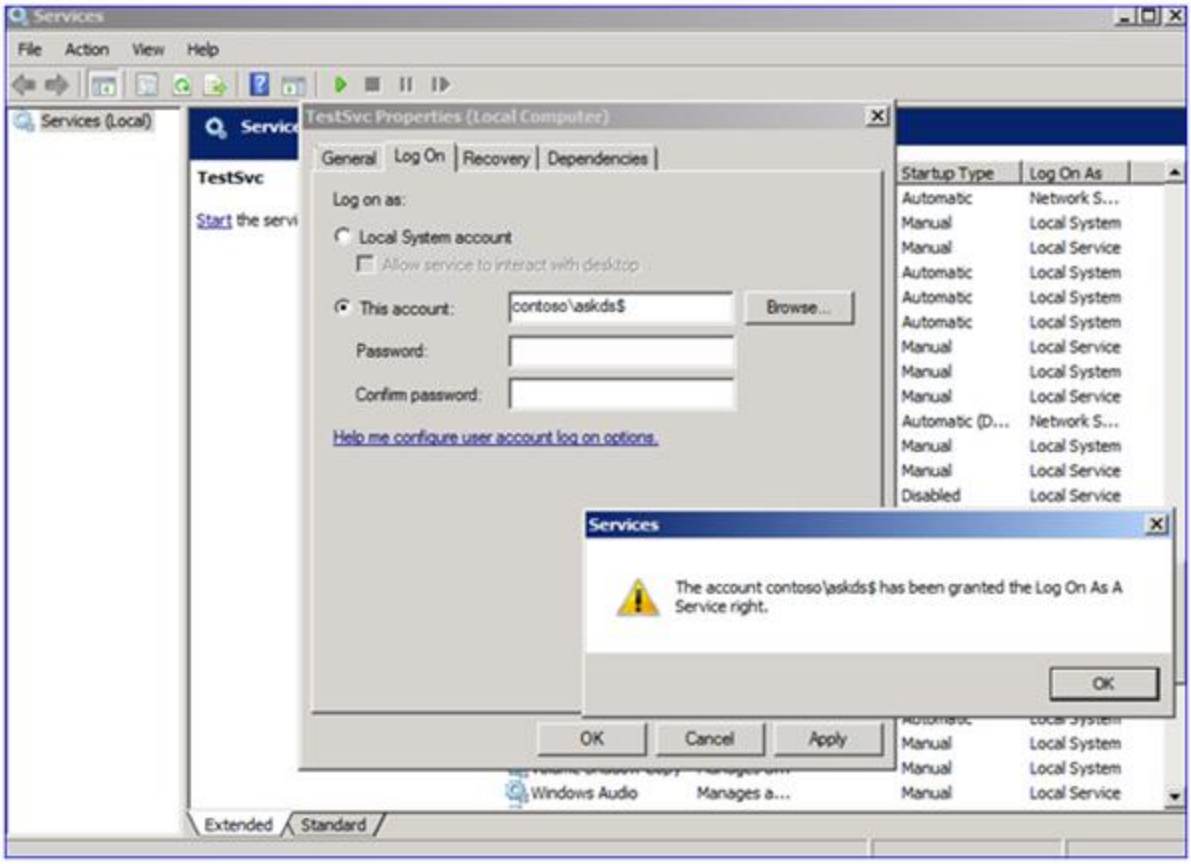
c. On the Log On tab, set “This Account” to the **domain\name$** of your MSA. So if your MSA was called “AskDS” in the “contoso.com” domain, it would be:

```
contoso\askds$
```

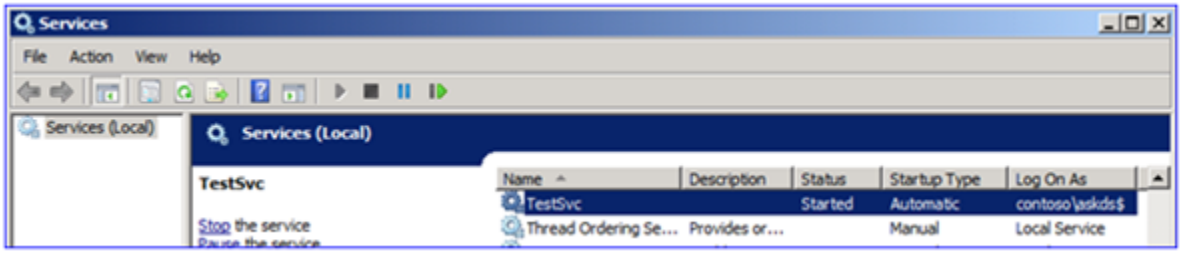
d. Remove all information from Password and Confirm password – they should not contain *any* data:

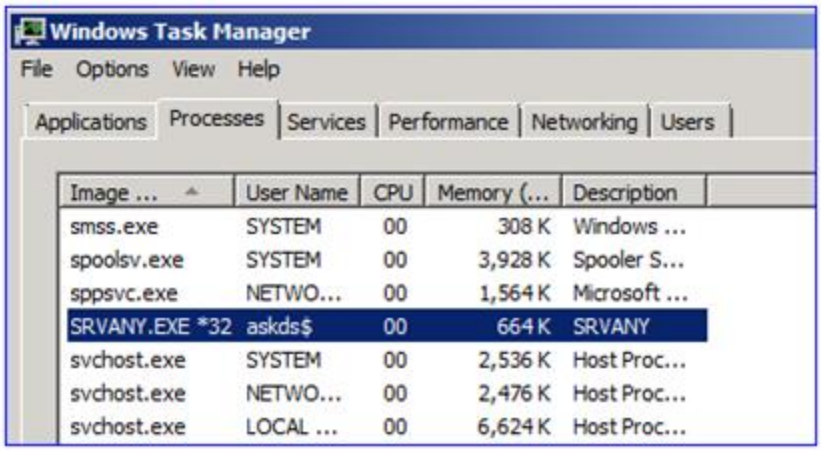


e. Click Apply and Ok to the usual “Logon as a Service Right granted” message:



f. Start the service. It should run without errors.





The PowerShell way:

a. Start **PowerShell**.

b. Paste this sample script into a text file:

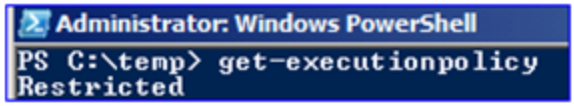
```
# Sample script for setting the MSA password through PowerShell
# Provided "AS IS" with no warranties, and confers no rights.
# See http://www.microsoft.com/info/cpyright.mspx

# Edit this section:

$MSA="contoso\askds$"
$ServiceName="'testsvc'"

# Don't edit this section:

$Password=$null
$Service=Get-Wmiobject win32_service -filter "name=$ServiceName"
$InParams = $Service.psbase.getMethodParameters("Change")
$InParams["StartName"] = $MSA
$InParams["StartPassword"] = $Password
$Service.invokeMethod("Change",$InParams,$null)
```

c. Modify the highlighted red sections to correctly configure your MSA and service name.

d. Save the text file as **MSA.ps1**.

e. In your PowerShell console, get your script policy with:

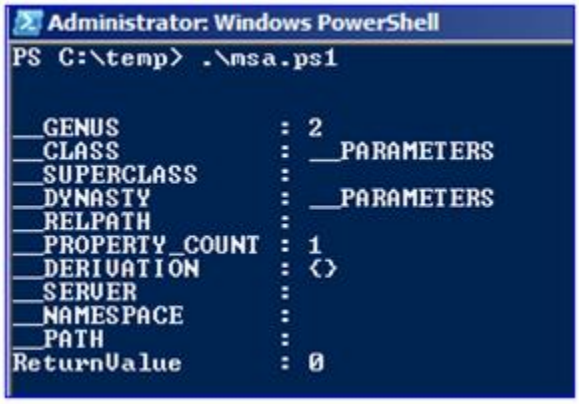
```
Get-ExecutionPolicy
```



f. Set your execution policy to remote signing only:

```
Set-ExecutionPolicy remotesigned
```

g. Run the script:



h. Set your execution policy back to whatever you had returned in step E:

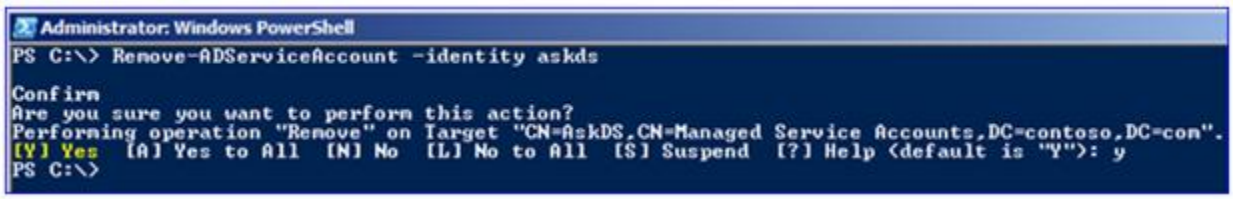
Note: Obviously, I made this example very manual; it could easily be automated completely. That's the whole point of PowerShell after all. Also, it is ok to shake your fist at us for not having the User and Password capabilities in the V2 PowerShell cmdlet **Set-Service**. Grrr.

Removal

Removing an MSA is a simple two-part process. Now that you know all the PowerShell rigmarole, here are the two things you do:

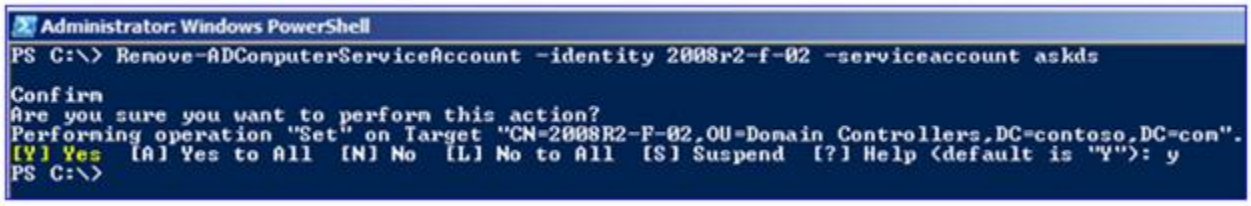
1. Use the following PowerShell cmdlet to remove the MSA from a local computer:

```
Remove-ADServiceAccount -identity <your MSA name>
```



2. Optionally, remove the service account from Active Directory. You can skip this step if you just want to reassign an existing MSA from one computer to another.

```
Remove-ADComputerServiceAccount -Identity <the computer the MSA was assigned to previously> -ServiceAccount <the MSA>
```



Group Memberships

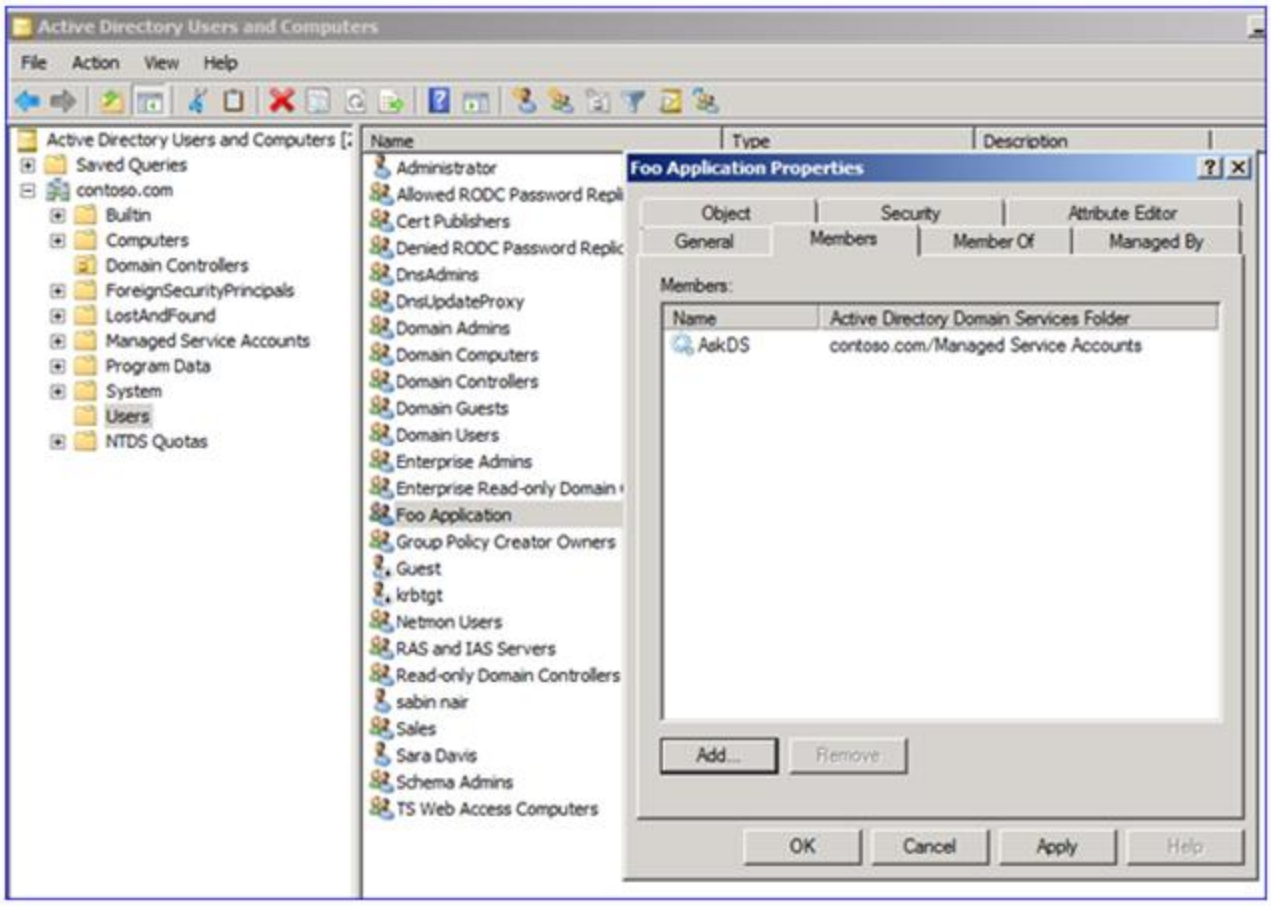
The **Set-ADServiceAccount** and **New-ADServiceAccount** cmdlets do not allow you to make MSA's members of groups. To do this you will instead use **DSA.MSC** or **Add-ADGroupMember**.

AD Users and Computers method:

1. Start **DSA.MSC**.

2. Select the group (*not* the MSA).

3. Add the MSA through the Members tab:



PowerShell method:

1. Start **PowerShell**.

2. Run:

```
Add-ADGroupMember "<your group>" "<DN of the MSA>"
```

So for example:

Note: Use the distinguished name of the MSA; otherwise **Add-ADGroupMember** will return "cannot find object with identity". Don't try to use **NET GROUP** as it doesn't know how to find MSA's.

Limitations

Managed Service Accounts are useful in most service scenarios. There are limits though, and understanding these up front will save you planning time later.

- **MSA's cannot span multiple computers** – An MSA is tied to a specific computer. It cannot be installed on more than one computer at once. In practical terms, this means MSAs cannot be used for:
    - Cluster nodes
    - Authenticated load-balancing using Kerberos for a group of web servers

The MSA can only exist on one computer at a time; therefore, MSAs are not compatible with cluster fail-over scenarios. And authentication through a load balancer would require you to provide a Kerberos SPN of the MSA account-- that won't work either. Load balancing scenarios include Microsoft software-based and third-party hardware and software-based load balancing solutions. If you're clustering or NLB'ing, then you are still going to need to use old fashioned service accounts.

A key clarification: You *can* have multiple MSAs installed on a single computer. So if you have an application that uses 5 services, it's perfectly alright to use one MSA on all five services or five different MSA's at once.

- **The supportability of an MSA is determined by the component, not Windows** – Just because you can configure an MSA on a service doesn't mean that the folks who make that service support the configuration. So, if the SQL team here says "we don't support MSA's on version X", that's it. You have to convince *them* to support their products, not *me* :-). Some good places to start asking, as we get closer to the general availability of Windows Server 2008 R2 in October: