

Windows Server Upgrade From 2012 R2 to 2019 Server

Sahana Yoganand, Prof. Geetha V
Department of Information Science,
R V College of Engineering Bengaluru, India

Abstract — Windows 2012 R2 server has been delivered as the operating system by Microsoft as part of the Windows family of the operating system. Windows 2019 Server is the newly delivered windows operating system by the Microsoft. The aim of this article is to compare and contrast the features of Windows 2019 Server and Windows 2012 R2. We use the terms such as In-place upgrade, Installation, Mitigation, Cluster OS rolling upgrade and License conversion to distinguish between different actions, which can be used in deploying the new OS deployment

Keywords—*In-place upgrade, Installation, Mitigation, Cluster OS rolling upgrade, License conversion.*

I. INTRODUCTION

Windows 2012 R2 was introduced by Microsoft in the year 2013 on June 3rd and it was also the successor of the original Windows 2012 Server and Windows 8.1 server. The Mainstream support ended on October 2018 but Microsoft has extended the end of life up to October 10 2023 for customers to align with the standard lifecycle transition timeline. A product is in mainstream for five years after it goes GA after that it goes to extended support, according to Microsoft's high-level support metric. This means the customer has to pay to have for additional support.

The extension of Windows 2012 R2 Server was to provide the support for Windows 2016 Server. The extended support date is a key one to note that Microsoft will no longer supports the windows security patches due to this server may become a potential security risk for the organization if not upgraded or replaced. Once the product is out of support there will be no further support will be provided which means that the customer cannot access to Security updates and non-security hotfixes, free or paid assisted support, Microsoft product development resources and updates to the articles from the Microsoft. Windows 2019 server is the most recently released operating system which was released simultaneously with OS 10 version 1809. On October 2nd, 2018, it was made available to customers for the first time. Microsoft introduced this version with few key changes such as hybrid cloud, better support for Linux, more security through virtual machines, storage system innovation and Windows center establishment.

II. WINDOWS 2012 R2 AND WINDOWS 2019 FEATURES DESCRIPTION

Windows 2012 R2 Server introduced dozens of latest features to the infrastructure, including File Services,

Storage, Networking, Clustering, Hyper-V, PowerShell, Windows Deployment Services, Directory Services, and Security. Features provided by Windows 2012 R2 are as follows:

- [1] File Services and Storage
 - a) Work Folder: Work folder helps in providing corporate data to the users because the device used by the user does not provide a joined domain which sync the data to any device allowing the work to be done on.
 - b) Data Deduplication: It tries to find and delete the duplication within the data on the volume while ensuring data remains accurate and complete.
 - c) iSCSI Target Server: Target server API's provides Windows Management Instrumentation providers for managing the iSCSI target server by creating virtual disks for the customers.
- [2] Storage spaces: Windows 2012 R2 extended this feature to get it up to speed with high-end Storage Area Networks in terms of features (SANs). Tiered Storage Areas, Write-Back Caching, and Flexible Resiliency Options were all included.
- [3] Networking
 - a) Windows Server Gateway: This is a software router for operating systems that enables network traffic to be routed between physical and the virtual networks, including the internet.
 - b) Hyper-V: Uses the role for most new significant or updated functionality.
- [4] Remote Desktop Services: There are many features included in RDS such as session shadowing, quick reconnect and There has been a significant amount of work put into enhancing compression and bandwidth utilization.
- [5] Windows PowerShell Task based on command line shell scripting, in Windows Server 2012 R2 this supports the desired state specification is a new Windows administration framework that allows you to install and maintain software service configuration data.

Windows 2019 Server, the latest generation takes the infrastructure to another level by providing and Security, Hybrid, Hyper-Convergence, Storage, and the Application Framework are all areas that are being improved. Windows 2019 server has new features that were not included in previous models.

Features which are newly introduced in 2019 servers are as follows:

- [1] Windows Admin Center: is a browser-based programmed that can be installed locally and used to manage servers, clusters, and hyper-converged infrastructure.
- [2] Hybrid Cloud: The server core application compatibility feature requires dramatically improving application compatibility of the OS installation by using a subset of binaries and components from the Desktop experience without adding graphical environment.
- [3] Storage: Storage migration service is a new feature in Windows 2019 server that simplifies server migration to updated windows versions. It also provides a graphical tool for inventorying server data as well as moving data and configuration to modern servers.
- [4] Application Platform: Linux on Windows, Built-in Support for Kubernetes and container improvements are the newly improved features in Windows 2019 servers
- [5] Security: Windows Defender Advanced threat protection and Security with Software Defined Networking are the important features. The ATP's platform sensors and response actions are subjected to memory and kernel level threats, which respond by suppressing exploitable vulnerabilities and terminating malicious processes. Many SDN features offer customers more confidence in running workloads on-premises or as a cloud infrastructure.
- [6] Desktop experience: The customer can change between Server core configurations and Server with Desktop Experience installations while installing Windows 2016 Server. This has been improved in Windows 2019 Server, which now contains the Desktop experiences and has a long-term maintenance network.
- [7]

III. DIFFERENCES IN WINDOWS 2012 R2 AND WINDOWS 2019 SERVERS

SL No	Hybrid Capabilities-Related Features	2012 R2	2019
1	Hybrid Cloud Option	No	Yes
2	Azure Backup integrated applications and infrastructure.	Yes	Yes
3	VM Protection	Yes	Yes
4	Azure Network Adapter	Yes	Yes
5	Storage Migration Service	No	Yes

Table 3.1 Hybrid Capabilities

SL No	Features That Contribute to Increased Security	2012 R2	2019
1	Expect Breach	No	Yes
2	Advanced Threat Protection	No	Yes
3	Virtual Machines for Operating system and Linux which are protected	No	Yes
4	Device Guard	No	Yes
5	Credential Guard	No	Yes

Table 3.2 Security

SL No	Characteristics with Enhancement	Associated Performance	2012 R2	2019
1	Linux containers		No	Yes
2	Windows Subsystem for hosting Linux		No	Yes
3	Server Core Features on Demand		No	Yes
4	Kubernetes platform support		No	Yes

Table 3.3 Performance

SL No	Infrastructure Management Characteristics	2012 R2	2019
1	Cluster wide monitoring	No	Yes
2	Precision Time Protocol (PTP)	No	Yes
3	Kernel soft reboot	No	Yes
4	Storage Health Monitoring	No	Yes
5	Data deduplication	Yes	Yes

Table 3.4 Infrastructure Management

SL No	Outdated featured in Windows 2019 Server	2012 R2	2019
1	Management of distributed scans	Yes	No
2	Service for Internal Database	Yes	No
3	Server core component for publishing	Yes	No
4	Check for Remote Desktop connection	Yes	No
5	Remote desktop virtualization host	Yes	No

Table 3.5 Outdated features in 2019

IV. OVERVIEW OF WINDOWS UPGRADE

The upgrading can vary differently in different operating system. The actions which can be involved in deploying Windows server are In-place upgrade, Installation, Mitigation, Cluster OS rolling upgrade and license conversion. Microsoft recommendation for upgrading Windows 2012 R2 to Windows 2019 is by In-place upgrade method.

Before starting Windows upgrade, some of the information must be collected because this information is intended for use of upgrade failure. These information's helps rolling back to the old state.

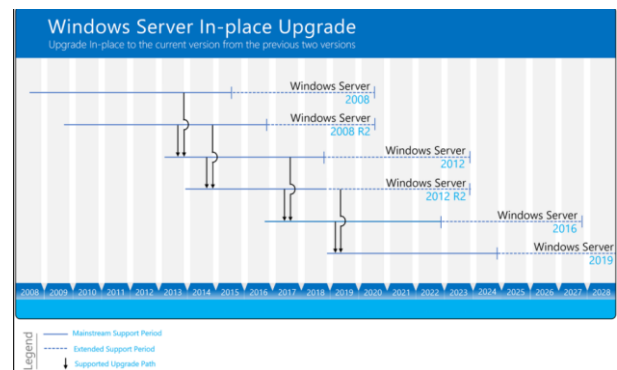


Figure 4.1 Windows Server In-place upgrade

At times, Server can be updated by at least one, if not two, versions. For instance, Windows 2012 R2 Server can be upgraded directly to 2019 server or first to 2016 server and then to 2019 server.

Direct installation means that we can remove an earlier version of the Windows operating system and replace it with a latest version. In this scenario, we will lose all of the older data in the method. This means the ISO issued by Microsoft should be installed.

Migration is a state where the by switching to a different set of hardware or virtual machine, an older version of the operating system is converted to a newer version of the operating system.

V. CONCLUSION

Windows 2012 R2 Server has been delivered as windows platform and is end of life has and is extended support until October 2023. All the Operating systems which are still working on 2012 R2 must be upgraded to the latest version of Windows version. The best way to upgrade to the latest way is through the In-place upgrade method as the data from the Windows 2012 server can transferred to the latest version of the operating system. Windows 2019 has enhanced features which makes the operating system more secured and more efficient platforms to work on.

VI. REFERENCES

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