Migrating from NetWare to Active Directory

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INTRODUCTION

Novell officially set March 2010 as the end of life for its NetWare network server and management software, and discontinued standard support at that time. While Novell is offering extended support through March 2012, many enterprises have to consider migration solutions now in order to be able to execute them by the time the support ends. This document describes the alternatives organizations have in migrating from NetWare, and details important considerations in crafting a successful migration strategy.

NetWare: Then and Now

NetWare was a fixture in many organizations throughout the 1990s, commanding almost 40 percent of the network operating system market in the early 1990s. However, its popularity began to wane with the rise of easier and more seamless networking solutions from Microsoft, and today NetWare's market share is less than 10 percent, according to an IDC network study. Today, Windows Server and Active Directory comprise the primary enterprise networking solution, but NetWare still has a significant installed base. In addition to the network operating system kernel, NetWare offers many other services; probably the most popular are file access and printing. Many enterprises still depend on these services and network features to run their businesses efficiently.

Novell NetWare provided enterprises with a network operating system with services that included organization, file storage and access, domain administration, client access, storage services, and network printing. The final NetWare kernel, version 6.5, was released in 2006. The latest—and last—Service Pack for NetWare 6.5 is SP8, which was released in October 2008. Regular support for NetWare ended in March 2010, with extended support expected to be available until March 2012. With NetWare currently in extended support, hardware vendors will no longer certify it on new server hardware. That doesn't mean that it won't work properly, but it does mean that enterprises will have to do their own hardware testing.

Also, third-party software solutions providers, such as anti-virus and backup software vendors, will stop developing for the NetWare platform. From a practical standpoint, the lack of availability of these essential tools precludes wide-scale use of NetWare indefinitely. It may still be used as a stopgap for applications not able to run on an alternative, but replacing it should be of high priority for those who have not yet done so.

Alternatives to NetWare

There are two primary alternatives to supplant Novell NetWare:

- Novell is recommending its Open Enterprise Server, which is based on SUSE Linux. One important advantage to choosing Open Enterprise Server is that it is from Novell, and therefore has the full support of that vendor, with the accompanying utilities and documentation to perform a migration.

- However, a second alternative is Windows Server 2008 and Active Directory. In the 1990s, during the height of NetWare's popularity, Microsoft shipped the first version of Windows Server, following it up quickly with Windows Server 3.51 and 4.0. Because of the ease of setting up networks using Windows Server, it rapidly became the choice of new installations.

There are advantages and limitations to each alternative, and every enterprise has to make a decision based on business needs, as well as technical and resource factors.

Migration Considerations

Good support should be a key consideration when choosing a migration path. Without good support, enterprises may not be able to get difficult technical issues addressed, or have confidence that maintenance releases will be forthcoming. Lack of support could leave an organization with a non-functioning network that requires an expensive and time-consuming fix, if it can be fixed at all.

Another consideration is skill base. Tens of thousands of certified NetWare engineers still actively maintain NetWare installations and services, and these resources will be essential during the migration and administration of the replacement infrastructure.

One mitigating circumstance is the lack of third-party NetWare network-enabled applications. Without third-party applications that support the network or make use of their services, enterprises may not be able to adapt their network infrastructure to changing needs.
business circumstances. The loss of this ability can make business more difficult and the enterprise less competitive. At its extreme, it could prevent the organization from pursuing business or adopting new and important technologies.

No matter which migration path is chosen, enterprises have to build a network infrastructure that meets their business needs and can be maintained and enhanced for the future. This document will help you select the best migration alternative for your organization, and then plan and execute a successful migration.

**THE ALTERNATIVES TO NETWARE**

**Novell Open Enterprise Server**

Novell’s upgrade path for network services and administration is to its Open Enterprise Server. At a high level, Open Enterprise Server can be defined as the collection of NetWare services running not on the NetWare kernel, but rather on SUSE Linux Enterprise Server.

(Although possible to run the legacy NetWare kernel and its associated services in a virtual machine under SUSE Linux Server, which may be necessary to support some specific legacy applications. However, this choice does not address the need to migrate to a supported network environment and operating system with future growth potential.)

Open Enterprise Server provides a Linux operating system environment coupled with traditional NetWare services. The operating system provides a host for the services, much as the NetWare kernel did for the same services.

**Migration Considerations for Open Enterprise Server**

Migrating to Novell Open Enterprise Server offers certain advantages. Because Open Enterprise Server provides the same network services as NetWare, the migration can be fairly seamless. In addition, Novell provides extensive documentation, including an extensive best practices guide for planning and executing a migration to Open Enterprise Server. This guide incorporates plans, information, checklists, and recommendations for migration of data storage, files services, print services, backup services, and more.

Furthermore, because the services provided by Open Enterprise Server are equivalent to the legacy NetWare services, existing NetWare skills can be transferred directly to the new platform with little additional training. Organizations will be able to leverage existing technical networking skills before, during, and after migration.

However, what Novell cannot easily do is provide the IT team with enterprise Linux server skills right out of the box. Novell itself recommends that at least some of the technical staff be certified Linux administrators and systems managers. It is certainly possible to hire people with Linux server skills, but that separates the server operating system from the hosted network services on that operating system. In addition, staff will require training in installation, day-to-day management and support, interoperability, and troubleshooting.

**Windows Server 2008 and Active Directory**

The other alternative is Microsoft Windows Server 2008 and Active Directory. Windows Server has been available as a network operating system since 1994, and today Windows Server 2008 is one of the most popular choices for a server operating system, as well as hosting a network.

![Figure 2. Microsoft’s Active Directory software represents the mainstream in network management today.](image-url)
Windows Server 2008 supports 18 different roles in an enterprise, most of which have to do with networking in some form. These include DHCP, file, print, AD, virtualization, Media Services, DNS, and Internet Information Services (IIS). Server Core, the basic configuration, also has other options, including WINS, failover clustering, subsystem for Unix-based applications, backup, multipath I/O, removable storage management, Bitlocker drive encryption, SNMP, Telnet client, and QoS (quality of service).

Windows Server 2008 also has a read-only domain controller (RODC) configuration. An RODC holds all the Active Directory objects and atttributes that a writable domain controller holds, except for account passwords. However, you can't make changes to the database stored on the RODC. You make changes on a writable domain controller and then replicate them back to the RODC.

The Server Manager helps with initial server setup and operation, including adding and removing server roles and features securely. It displays server status, exposes key management tasks and provides access to advanced features. IT staff can run tasks from the command line, allowing for easy automation through scripts.

Active Directory (AD) is Microsoft's network management software that works in conjunction with Windows Server. AD provides domain services, directory services utilizing LDAP, rights management, federation management, and certificate services. It runs on a Windows Server and its services are controlled through a console on that server.

**Migration Considerations for Windows Server and Active Directory**

Novell does not provide a ready-made solution for migrating from NetWare to Windows Server and NetWare to AD, as it does for migrating to Open Enterprise Server. However, such solutions are available from third-party vendors.

**NetWare**

Like Open Enterprise Server, Windows Server and AD offers network services that are mature and reliable. And both operating systems have been used extensively as enterprise server platforms, especially Windows Server.

Many organizations already run Windows Server as a part of their infrastructure because a number of enterprise-quality applications require or support its use. Therefore, to at least some extent, the skills are in place, and technical professionals are highly interested in remaining current on Microsoft networking technologies.

Furthermore, enterprises can be confident of a future growth and expansion path with Windows Server and Active Directory. Windows Server is in its seventh major release, and is both a mature product and more popular than ever. There is no question that Microsoft will continue to devote significant development resources to its flagship computing product.

**COMPARING THE ALTERNATIVES**

Which migration path is “better” for your organization depends on a number of factors, including costs, resource requirements and availability, long-term reliability of the solution, and technical and business requirements.

If continuation of NetWare services is required or highly desired in your organization, and sufficient Linux server skills are readily available within the existing technical staff, migration to Open Enterprise Server might be the better choice.

On the other hand, your organization might already have substantial Windows Server experience, including Windows domains, because of application requirements or perhaps due to an acquisition. If the Windows Server and Active Directory services meet the present and projected future requirements of the enterprise, the clear migration path might be to the Microsoft platform.

One strategy is to adopt both alternatives—run both Open Office Server and the Microsoft solution side-by-side, using the transport or service that makes sense for a particular application. For example, you might use Windows Server and Active Directory for authentication and authorization, and for application services, and use NetWare on the same physical network for file and print services.

However, we do not recommend this strategy, for two fundamental reasons. First, using both network platforms means acquiring and maintaining two distinct skill sets, and doubling the administrative workload. Second, network faults and other issues may be difficult to trace to the appropriate network operating system, perhaps doubling the amount of time required for diagnosis and repair. In fact, each network operating system vendor would likely blame the problem on the other product, making it challenging to get an objective diagnosis.

**A STRATEGY FOR MIGRATION**

A migration project can take anywhere from a few weeks to over a year, depending on the complexity of the network and external factors that may be driving the migration. To ensure business continuity, organizations usually must run both the legacy NetWare network and its replacement side by side until the organization has complete confidence in the replacement and the overall success of the migration.

For either migration alternative, it’s critical to have a clear understanding of the reason for the migration and its resulting objectives. You need a project plan that includes all tasks, a timeline, dependencies, and resources required for the migration from start to finish. It should also list objectives and criteria for determining if and when those objectives are met.

The first step is to understand and visualize your existing NetWare network. Certainly a physical inventory of network
objects is required, but it is also necessary to understand the connectivity between these objects, as well as the overall structure of the trees in the network. If you already have such diagrams and inventories, make sure they are up to date. Take the time to do a last physical inventory, and get the enterprise network specifications completely up to date.

Next you should analyze that NetWare structure to determine if it meets your current and projected future business needs. That is not required as a part of the migration process, but the changes involved in migration provide a good opportunity to look at other short- and long-term needs of the network.

Once you have established the scope of the project, look at ways to automate the project and make it as seamless and accurate as possible. Whichever migration path you choose, having the right tools to help is essential.

Novell offers one primary migration tool for migration to Open Enterprise Server 2 SP2: the OES 2 SP2 Migration Tool. This tool includes a consolidated GUI interface that lets you drag and drop the volumes and services to be migrated. It runs exclusively on the destination OES server and pulls service configuration information and data from the NetWare source server.

Neither Novell nor Microsoft offers tools to migrate from NetWare to Windows Server and Active Directory. However, third-party migration tools are available. Quest Migration Suite for Active Directory, for example, supports thorough migration planning, including identifying accounts and groups for migration and creating a schedule. It also supports domain tree pruning and grafting. Perhaps most importantly, the Quest solution performs the migration while the network is in use, which ensures there is no downtime for activities that might otherwise have to be accomplished after hours.

**CONCLUSION**

Enterprises seeking to migrate from Novell NetWare to a more modern and supported network operating system and services have to identify their business communications and networking requirements, as well as their technical and resource constraints, in order to choose a migration path.

For many of these organizations, Windows Server and Active Directory will make sense. Many organizations already run Windows Server as a part of their infrastructure, and their IT staff already have—and want to expand—skills in Microsoft networking technologies. Organizations that choose to migrate to Open Enterprise Server services, on the other hand, will find that many current NetWare skills will transfer to the new platform, but many of the operating system-specific activities will have to be relearned.

Furthermore, enterprises can be confident of a future growth and expansion path with Windows Server and Active Directory, while questions remain concerning the resources Novell will be willing and able to put into Open Enterprise Server. Novell's total business is down significantly from its heyday in the 1990s, and its merger in 2001 with Cambridge Technology Partners shifted its focus from a network leader to a systems integrator and solutions provider.

No matter which migration path you choose, proper planning and rapid execution are the keys to success. Migration tools can assist with planning and automate execution, not only accelerating completion of tasks but also ensuring accuracy. With the right tools, you can enjoy the successful completion of your migration project, even with an aggressive project schedule.