Integrating FusionLayer Infinity with Microsoft AD

A White Paper by FusionLayer Inc.

FUSIONLAYER

Annankatu 27
00100 Helsinki
Finland

info(at)fusionlayer.com
+358 75 325 2992
www.fusionlayer.com

1.   DDI in Microsoft AD Environments

Organizations running Microsoft DNS and DHCP services as part of their enterprise networks have traditionally relied on Excel spreadsheets for managing the subnet, VLAN and IP assignments, as well as qualitative and policy aspects of their enterprise networks. This results in inefficiencies that increase the Operating Expense (OPEX) associated with managing these mission-critical network resources. By automating the manual management processes, enterprises can streamline the day-to-day network management routines, minimizing the chance of network downtime and reducing the Operating Expenses (OPEX) considerably.

The larger the network, the more inefficient this approach becomes, because Microsoft–based solutions offer no process automation to help network administrators in keeping their spreadsheets in synch with the live production data. The problem is especially dire in mid-sized and large geographically distributed network environments where the management of DNS and DHCP services is delegated to several network and/or systems administrators.

This White Paper describes how organizations can implement FusionLayer Infinity as a Software-Defined IPAM layer on top of their existing Microsoft DNS and DHCP architecture, without having to install any agents and/or other software on the existing Microsoft AD servers. Once the management of traditional on-premise enterprise networks have been consolidated into FusionLayer's patented Network Source of Truth (NSOT), the solution can be extended into a single pane of glass that provides visibility and audit trails also into network segments in the public and edge clouds.

With the growth of hybrid cloud and edge cloud environments, the need for organizations to maintain full network visibility grows. With FusionLayer's patented Network Source of Truth, the solution can be extended into a single pane of glass that provides full visibility and audit trails.

2. Business Case for FusionLayer Infinity Software-Defined IPAM in Microsoft AD Environments

When organizations started deploying Microsoft AD in their enterprise networks more than 20 years ago, clients relying on IP consisted mostly of traditional workstations, laptops and servers. In these environments, Microsoft AD was often the most pragmatic choice for DNS and DHCP, as these services were included in Windows Server by default.

Since the early 2000s, enterprise networks have evolved significantly. Over the last few years, both the variety and the number of network clients utilizing IP addresses have increased substantially. Enterprise networks have grown in scope and complexity, while at the same time, the digital transformation of industries and verticals has made these networks a critical element of business operations. Technologies such as virtualization and VoIP place increasing importance on efficient and transparent management of the network and the IP resources. Not only are there more IPs to manage than ever before, but the clients have also become more mobile, making it more difficult and time-consuming for the administrators to keep up with the network environment in constant change.

Benefits of Running FusionLayer Infinity as the NSOT for Microsoft AD Environments

1. FusionLayerInfinity has been designed for efficient management of organizations name and address space, replacing Excel spreadsheets and allowing delegated management with configurable access rights and audit trail via web-based GUI. As organizations expand to the edge and cloud, VLANs are providing the levels of security, flexibility and connectivity for dispersed devices that they need -- and for these spaces, FusionLayer Infinity provides efficient and cost-effective management. This management capability also extends to the network policies governing the security, automation, and rapid response now so critical to business success.

2. Automated synchronization of all static and dynamic hosts in AD Zone(s) to the appropriate subnets managed in FusionLayer Infinity, without any manual intervention, complemented with IP Sweeptools for network discovery.

3. Bindings between MS DHCP servers and subnets as well as configuration of DHCP scopes can be carried out centrally from Infinity IPAM for each subnet.

4. Support for making static DNS entries to AD Zone(s) from FusionLayer

FUSIONLAYER

Annankatu 27
00100 Helsinki
Finland

info(at)fusionlayer.com
+358 75 325 2992
www.fusionlayer.com

5.   Support for centralized user authentication via LDAP / Microsoft AD.

6.   Can be run as virtual machine in existing Citrix or VMware environment, eliminating the need for operating platform investment.

The major shortcoming of many network environments relying on Microsoft DNS and DHCP services is that there are no interactive tools that could be used for efficient real-time management of IP address space and related resources. Organizations utilizing spreadsheets in their IP Address Management typically lack the following features that automate and centralize IPAM processes, and introduce the transparency required by various compliance settings:

- Delegated management process via web-based GUI with granular user management, user authentication via LDAP, and audit trail of changes (who, what, when)
- Automated synchronization of dynamic & static clients in Microsoft AD networks to subnets defined and managed in centralized IPAM
  - Centralized management of bindings between subnets and scopes configured to MS DHCP servers.
  - Purpose-built tools used to distribute and allocate subnets
  - Tracking the use of dynamic IP addresses issued by Microsoft DHCP server
    Tracking the use of static IP entries made to Microsoft

By implementing FusionLayer Infinity SD IPAM on top of the existing Microsoft AD architecture, organizations can introduce the above listed features to their network environment in a matter of days, without having to install any software on the Windows Server 2008/2012/2016 or make any changes to the existing architecture.

According to figures released by Gartner in 2014, the average cost of network downtime is around $5,600 per minute -- which equates to around $300,000 per hour. Research from the Aberdeen Group in 2019 suggests that IT downtime costs businesses an average of $163,674 per hour. Whichever way you look at it, network downtime is an expensive proposition: employees lose access to the web, software programs, data files, and email, and the organization as a whole suffers.

If something goes wrong when network changes are made and the network experiences problems as result, how long is the average outage and what would be the direct and the opportunity cost of downtime?

To quantify the annual OPEX of the existing IP address management process utilizing Excel spreadsheets, organizations should estimate the number of hours each network and/or systems administrator spends on the tasks listed below and multiply the result by the number of administrators and their average hourly salary. The OPEX calculation can be carried out by estimating the time spent on the following tasks:

- How long does it take to add a static host to DNS?
- How long does it take to add dynamic hosts to DHCP service:
  - With fixed IP address?
  - Using MAC authentication?
- How long does it take to find out which IPs the DHCP servers have assigned from dynamic range at any one time?
- After making changes to DNS and DHCP, how long does it take to make related changes to the Excel spreadsheet?´

By implementing FusionLayer Infinity on top of their existing Microsoft AD architecture, organizations can automate and centralize the management of their IP.
The impact of downtime extends beyond the walls of the corporate HQs. FusionLayer's Network Source of Truth provides the enterprise-wide visibility, and with the single pane of glass oversight they need to identify issues and prevent downtime.

- Before adding hosts or configuring scopes:

    o How long does it take to find a free IP?

    o How long does it take to locate correct subnets and calculate bitmasks?

    o How long does it take to verify that the calculations were correct?

    o How long does it take to make sure there are no double IP entries and to make sure that the source is up to date?

- How long does it take to find the location or other information pertaining to a specific client in the network and how often are searches performed?

- How long does it take to locate correct subnets and calculate bitmasks?

- How long does it take to verify that the calculations were correct?

- How long does it take to make sure there are no double IP entries and to make sure that the source is up to date?

How long does it take to find the location or other information pertaining to a specific client in the network and how often are searches performed?

The more IPAM administrators there are in an organization and the more business critical the network is, the higher the cost of a manual IP address management process utilizing Excel spreadsheets. By automating and streamlining the process with FusionLayer Infinity, organizations can earn a Return on Investment (ROI) that significantly exceeds 100% per annum, especially in cases where the manual process has already led to costly downtime. And the reduction in downtime costs can represent savings of hundreds of thousands or even millions of dollars each year.

FUSIONLAYER   Annankatu 27   info(at)fusionlayer.com
                   00100 Helsinki   +358 75 325 2992
                   Finland   www.fusionlayer.com

3. Integrating FusionLayer Infinity with Microsoft AD Environment

To integrate FusionLayer Infinity SD IPAM with Microsoft AD Environment as described in this document, the following steps should be taken:

1. Download FusionLayer Infinity for trial and install it as virtual machine or on native x86-based server. Further installation instructions can be found from FusionLayer Infinity Reference Manual.

2. Once FusionLayer Infinity has been installed, configure FusionLayer Infinity as secondary to AD master zone(s) in Microsoft AD. After taking this step, all changes taking place in the AD zone(s) are automatically pushed to FusionLayer Infinity. Once AD zone(s) has been configured as secondary in FusionLayer Infinity, it will also be possible to add static hosts to AD zone(s) from FusionLayer Infinity. Further instructions can be found in the FusionLayer Infinity Reference Manual.

3. Once the AD zone(s) has been added as secondary in FusionLayer Infinity, configure the subnets / blocks in your network as address blocks in FusionLayer Infinity. After an address block has been configured in Infinity, it will automatically retrieve all contents of the AD zone file & populate those IPs automatically to the corresponding address block / subnet configured in Infinity SD IPAM. Setting up blocks / subnets in Infinity has been described in further detail in the FusionLayer Infinity Reference Manual.

4. Once the subnets / address blocks have been configured in FusionLayer Infinity SD IPAM, integrate Microsoft DHCP servers using the Remote Servers module included in FusionLayer Infinity. This process has been described under "Setting up Microsoft DHCP Integration" in the FusionLayer Infinity Reference Manual. Once you have integrated Microsoft DHCP Server with FusionLayer Infinity, you can manage the relationship between subnets / address blocks and subnets managed in Infinity using the DHCP integrated service page.

5   As the last step, configure the groups authorized to access the centralized FusionLayer Infinity SD IPAM and defined their user privileges. Once the groups have been configured, they can be attributed to new user accounts generated in FusionLayer Infinity. When accessing the system, users can either be configured locally or centrally via LDAP. The User Groups functionality and centralized authentication via LDAP have been described in further detail in the FusionLayer Infinity Reference Manual.
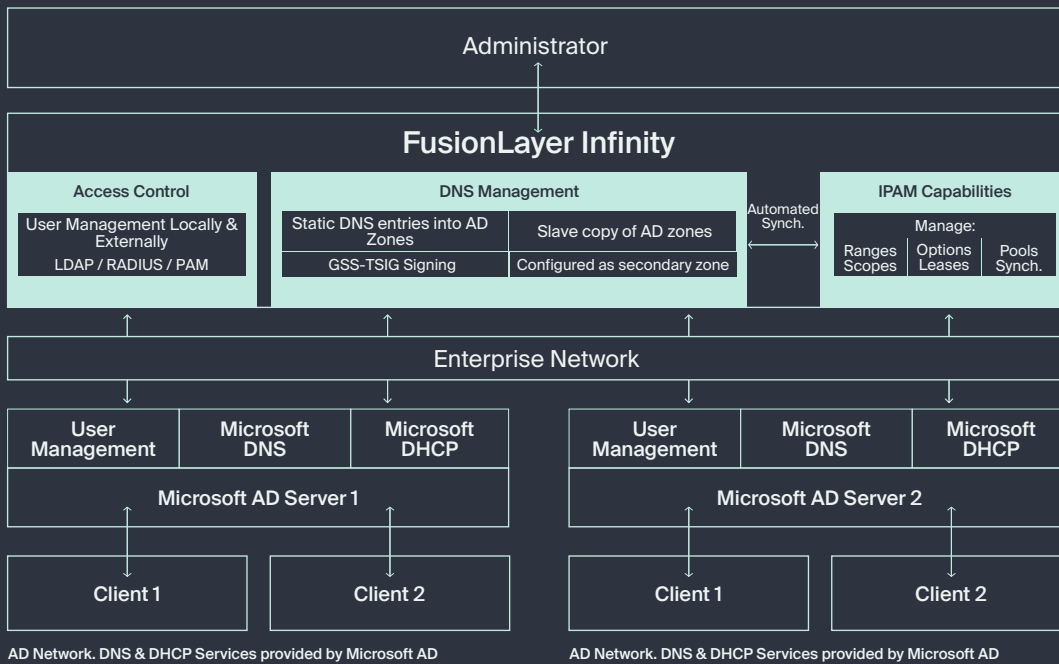

Figure 1:

Nonintrusive Infinity IPAM layer on top of existing Microsoft AD architecture.

FUSIONLAYER

Annankatu 27
00100 Helsinki
Finland

info(at)fusionlayer.com
+358 75 325 2992
www.fusionlayer.com

About FusionLayer Products

Managing complex corporate and telecom networks is a challenge where the cost of failure is enormous. FusionLayer collates all network information into a single Network Source of Truth, accessed securely by both engineers and automation to eliminate the chance of network downtime – on-premise, at the edge, and in the public cloud. This provides our customers with reassuring realtime information, so their digitalized operations can connect 24x7x365.