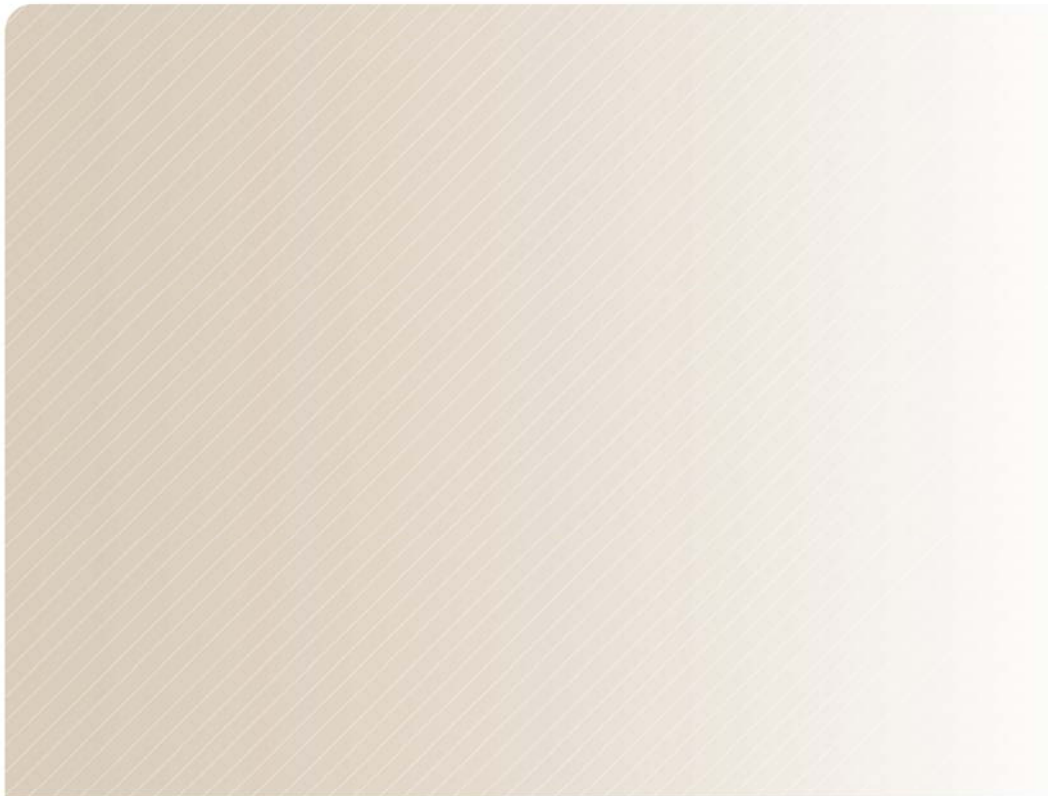


## DHCP Management module



This white paper discusses the challenges involved in managing a complex DHCP infrastructure.

The purpose of this paper is to introduce the **Men & Mice DHCP Management module** as natural solution for dealing with the challenges discussed. The DHCP Management module is one of four application modules that comprise the **Men & Mice Suite**. The Men & Mice Suite allows centralized management of DNS, DHCP and IP configuration in general by integrating all IP address management functionality into a single unified management interface.



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## 1. Introduction

DHCP servers automate the assignment of IP addresses and other IP parameters, necessary for devices to connect to computer networks. This means that properly configured DHCP servers are critical for all networks offering dynamic connection services. On the other hand, as networks grow in scope and services, it becomes increasingly more difficult to provide this basic service in a reliable and professional way. There are a couple of reasons for this. First, network growth usually results in increased number of DHCP servers connected to the network, and/or larger DHCP lease pools (i.e. set of IP addresses) served by each server. This entails more servers and resources that must be managed. Secondly, and more importantly, standard DHCP servers, such as Microsoft's or ISC's, don't provide adequate management interfaces for dealing with multiple DHCP servers. While the standard interfaces may be good for controlling individual servers, they offer administrators very little help when it comes to the management of multiple servers.

In this paper we will discuss the main challenges network administrators face when managing multiple DHCP servers, and we will see how these challenges are met, and dealt with, by the Men & Mice DHCP Management module. True to the Men & Mice approach, the DHCP Management module addresses the problem in a direct and non-intrusive manner, by providing the missing management layer for the existing servers. This allows organizations to deploy a sophisticated management system on top of their DHCP infrastructure, and thus hold onto their existing investments.

The Men & Mice DHCP Management module is one of four application modules which comprise the Men & Mice Suite. The other three modules are:

- DNS Management Module
- IP Address Management Module
- Analyzing and Monitoring

By integrating all IP address management functionality into a sophisticated, unified interface, the Men & Mice Suite allows centralized management of DNS, DHCP and IP configuration in general. It is possible to license the Suite with one or more of the modules, but the real value of the Men & Mice Suite is realized when they come together in a powerful integrated application for DNS, DHCP and IP Address Management. Working together, the modules provide a unique solution enabling organizations to keep track of their IP address space, individual hosts on the network, and their associations in DNS and DHCP.

## 2. The challenge of managing multiple DHCP servers

Managing multiple scopes on multiple DHCP servers, using only the default tools, entails all sorts of management problems for network administrators. The most serious problems facing administrators are the following:

- **Problems with access rights.** Users which have access rights to a given DHCP server can change all its scope information. In large distributed enterprises this is usually not acceptable. What is needed is a way to restrict access to scope level, and even down to individual IP addresses and ranges. This is impossible when using only default DHCP server functionality.
- **No unified interface.** Administrator can only view data from one DHCP server at a time. Of course, there are some workarounds like having multiple terminal sessions, or multiple snap-ins. But in the end, the administrator is always viewing one DHCP server at a time and has no means of getting a unified cross server view of the DHCP data.
- **Utilization reports.** Getting a good overview of the DHCP scopes and their utilization can be very difficult, using only the default tools.
- **No audit trail.** Who did what, when and why? While standard DHCP servers provide audit log for standard DHCP events, like DHCP Request and DHCP Release, there is no audit trail kept for user activity. Thus administrators are often left in the dark as to who did what, when and why.
- **Impossible to search and do mass editing across servers and scopes.** The default tools only allow operation on one DHCP server at a time. Doing mass changes across servers and scopes is both a tedious and error prone task.
- **Failover.** The DHCP standard doesn't define any failover mechanism. ISC's implementation of DHCP does provide such mechanism, but most standard implementations, most notably Microsoft's, don't provide any such features. A common approach to implement failover, when using servers which don't provide native support for such functionality, is to use a *Split scope* configuration. The drawback is that the default tools don't provide any error or consistency checks for split scope configurations. In particular, there is nothing which enforces/checks that reservations are identical on all instances of a given split scope.

Of course, it is possible to name other challenges, but ask anyone involved with the administration of DHCP servers on larger networks, and he or she is likely to mention most, if not all, of the problems enumerated above.

## 3. Managing DHCP servers with the Men & Mice DHCP Management module

### 3.1 Introduction

The management problems associated with complex DHCP infrastructures have, with few exceptions, little to do with the DHCP servers themselves. In fact, there is little wrong with the standard implementations as such. These implementations are industry hardened, provide robust DHCP services, and offer good management interfaces for controlling basic DHCP functionality. The management challenges arise because administrators lack a unified, integrated interface, and are consequently managing each server individually. This is the gist of the problem.

The Men & Mice approach is to deal with the problem head-on and provide the missing management layer. In other words, there is no need to engage in grand scale network redesign or replace existing DHCP servers with new server boxes or appliances. The Men & Mice DHCP Management module provides a unified management interface on top of existing servers, allowing organizations to preserve their investment and continue to operate, using standard and proven DHCP technology.

Being part of the Men & Mice Suite, the DHCP Management module builds on the Suite's application infrastructure. In essence, this consists of a central server, called Men & Mice Central, and a sophisticated Windows application, the Men & Mice Management Console (footer: For full description of the technical architecture of the Men & Mice Suite consult the white paper, *Managing the IP address space with the Men & Mice Suite*). The Management console provides the user interface for managing the DHCP servers connected to the system, and offers powerful functions, such as searching and mass editing. All operations performed in the user interfaces are relayed through Men & Mice Central, which takes care of updating the relevant DHCP servers.

Central uses standard (Microsoft) APIs to communicate with and control the managed DHCP servers. The connected DHCP servers are always treated as the authoritative source of DHCP scope and lease data. DHCP configurations made through the Men & Mice Management Console are visible in the standard Microsoft interface and vice versa. Updates can also be performed simultaneously through both interfaces without causing any problems.

Managing DHCP servers the Men & Mice way, i.e. by using a separate management interface and relay all traffic through a central server, allows for great flexibility in defining user access rights and makes it easy to deal with the management problems enumerated in the last section.

## 3.2 Features

Some of the main features of the DHCP Management module include:

- **Non-intrusive, easy deployment.** No migration or redesign required - works with the existing DHCP servers and data.
- **Multiple concurrent users and role-based access control.** Administrators can create user profiles and grant individual users different access privileges on server, scope and IP address level.
- **Global overview.** The DHCP module provides an instant access to all of the connected DHCP servers. Servers and scopes can be sorted and filtered. The global listing of scopes makes it possible to select multiple scopes on various servers and update certain scope options across all servers in one operation.
- **Mass updates.** The Search & Update process can be used to make multiple updates across servers and scopes in one operation.
- **Intuitive user interface.** The user interface is designed to automate and ease DHCP management. It supports all common DHCP management tasks, such as: Configuration of server and scope options, managing scope lists and updating scopes.
- **Complete audit trail.** All changes done to DHCP configuration are logged.
- **Powerful reporting tool.** Using the DHCP Management console's reporting capabilities, it is easy to get a good overview of scope utilizations.
- **Integration with IP Address Management.** When the Men & Mice IP Address Management module is enabled, the creation, deletion and configuration of DHCP scopes is automatically synchronized with other IP address related data.
- **Integration with DNS Management.** Enabling the Men & Mice DNS Management module further results in added benefits. Administrators can easily view device associations, both in DNS and DHCP. Changing information in DHCP view (e.g. IP address) will automatically change the corresponding information in DNS, and vice versa.

### 3.3 Powerful integration capabilities

As already discussed, the DHCP Management module is one of four application modules comprising the **Men & Mice Suite**. Two of the most powerful features listed above have to do with this fact. The Men & Mice Suite integrates all IP address management functions into a centralized unified interface, allowing for intuitive management of DNS, DHCP and IP configuration in general. It provides a scalable and adaptable platform that can accommodate any IP address management requirements.

The integrated, unified approach of the Men & Mice Suite makes it easy to work with multiple DNS and DHCP servers. Administrators have a unique overview of the network and can handle their responsibilities in complete harmony with other roles of network management. For example, someone responsible for a part of the IP address space can see each host's association both in DNS and DHCP. Similarly, someone viewing and updating DNS or DHCP data, can easily see the association of DNS and DHCP entries with other IP address data.

Powerful reporting capabilities allow administrators, at any time, to get a good overview of the IP address space, its sub-ranges, DNS zones and DHCP scopes down to individual devices. The Men & Mice Management console also provides powerful integrated filtering capabilities. Users can filter the view by several means:

- By using the Quick Filter. This allows administrators to do quick as-you-type searches/filtering into the IP address space, across DNS and DHCP servers, according to any property value
- By choosing if unused IP addresses should be displayed or not
- By DHCP reservations (only show reservations)
- By DNS (only show hosts that exist in DNS)
- By choosing if hosts belonging to sub-ranges should be displayed or not.

## 4. Conclusion

Managing complex DHCP infrastructures on large dynamic networks is a difficult, error prone task, when administrators lack adequate management interfaces and are forced to manage each server individually. In such scenarios, the Men & Mice DHCP Management module provides the perfect remedy.

The Men & Mice DHCP Management module provides a unified management interface on top of existing DHCP servers. It is a sophisticated, feature rich management solution, which also carries a lot of potential through its seamless integration with other modules of the Men & Mice Suite. Deploying the DHCP Management module costs no downtime, requires no network redesign, nor new DHCP server boxes or appliances. Organizations can hold on to their existing investment and know-how, and continue to operate, using standard and proven DHCP technology.