

Papers on UNIVERGE Software

MA4000: An Agile Approach to Maintenance and Administration

By Rod JOHNSON*

ABSTRACT The MA4000 Management System is NEC's newest "Maintenance and Administration" application that is built upon the Microsoft NET framework providing secure web-based access for performing simple moves, adds and changes. The highlighted features of MA4000 are: 1) Reduce TCO (Total Cost of Ownership), 2) Anywhere, anytime access, 3) Event notification for proactive action, 4) Audit trails for security & troubleshooting, 5) Meets IT expectations such as security, wizard based moves, adds and changes that are schedulable.

KEYWORDS Maintenance, Administration, Agile, LDAP (Lightweight Directory Access Protocol), Centralized, Notification, Scheduling, Security, Authentication

1. INTRODUCTION

The trend in the IP telephony market is for the customer to maintain their own communications systems, from anywhere and anytime through secure web-based transactions.

The UNIVERGE MA4000 management system is an agile, web-based product designed to manage and configure NEC communications systems using a unified central methodology. The MA4000 management system expands its feature set using additional applications that allow an IT Administrator to integrate his/her NEC Enterprise Communications Platform (ECP) into the corporate business environment.

Such an application is the MA4000 LDAP (Lightweight Directory Access Protocol) Auto Provisioning Service module. It allows integration into any LDAP version-3 enabled application. This integration can be used to keep information related to MA4000 users up to date and can automatically add new users and phones to the IP Telephony system.

2. MA4000 IS SECURE AND FLEXIBLE

The MA4000 Management System is secure and flexible. It supports operation within an encrypted mode, secure socket layer (HTTPS) and allows man-

ager and desktop user access rights to be granularly and flexibly assigned by the allocation of "roles" defined by the manager.

The MA4000 Management System is modular in nature so that users can order and configure it to meet their business and communication needs. Its primary modules, at first release are:

- MA4000 Manager module.
- MA4000 Assistant module.
- LDAP Auto Provisioning module.

Each module is licensed on the basis of the number of extensions in the network to be managed. At first release, the MA4000 supports the UNIVERGE SV7000. Later releases will support other NEC telephony systems, as well as other applications.

3. NEC CENTRALIZED AUTHENTICATION SERVICE

The NEC Centralized Authentication Service (NEC CAS) is a method of central authentication that uses "Login Redirection" to authenticate users. This particular method that is used by MA4000 and that may be used by other NEC applications was developed at Yale University. It is freely licensable as long as those using it mention that it was designed at Yale University.

The MA4000 has made some enhancements to it to allow it to support the following login capabilities:

*NEC Unified Solutions, Inc.

- Active Directory (Windows authentication).
- LDAP authentication.
- Internal database password storage that is fully encrypted.

NEC partners and customers who purchase the MA4000 Management System and are interested in using its NEC CAS, will be able to do so.

The NEC CAS is a single sign on method that can be used with any browser and application that can accept cookies and communicate with SOAP (NEC has enhanced it to support Windows applications as well).

The NEC CAS can reside anywhere on the customer network. The MA4000, during its install process asks the installer if they already have the NEC CAS in operation on their network. If they do, they specify where it is located on the network. If they do not, the MA4000 Installation will install it. Other NEC applications that choose to use the NEC CAS will follow the same procedure during their installation.

4. MA4000's THREE PRIMARY MODULES

(1) MA4000 Manager

The MA4000 Manager is the main interface for performing moves, adds, changes, reviewing events, setting up general characteristics of operation and defining connections to NEC communication systems. All functions are accessible via a menu. The homepage displays two “grids” that allow the manager to see “at-a-glance” any events or scheduled tasks. Whenever “grids” or “tables” present information or data within the MA4000, they can be sorted by any column by clicking on the column heading (**Fig. 1**).

(2) MA4000 Assistant

The MA4000 Assistant allows organizations to perform “decentralized” management by providing a “desktop” interface for individual phone users. The Assistant interface allows phone users to control and program the functions of their phones according to the role (access rights) assigned to them by the manager (**Fig. 2**). Some of these functions are as follows:

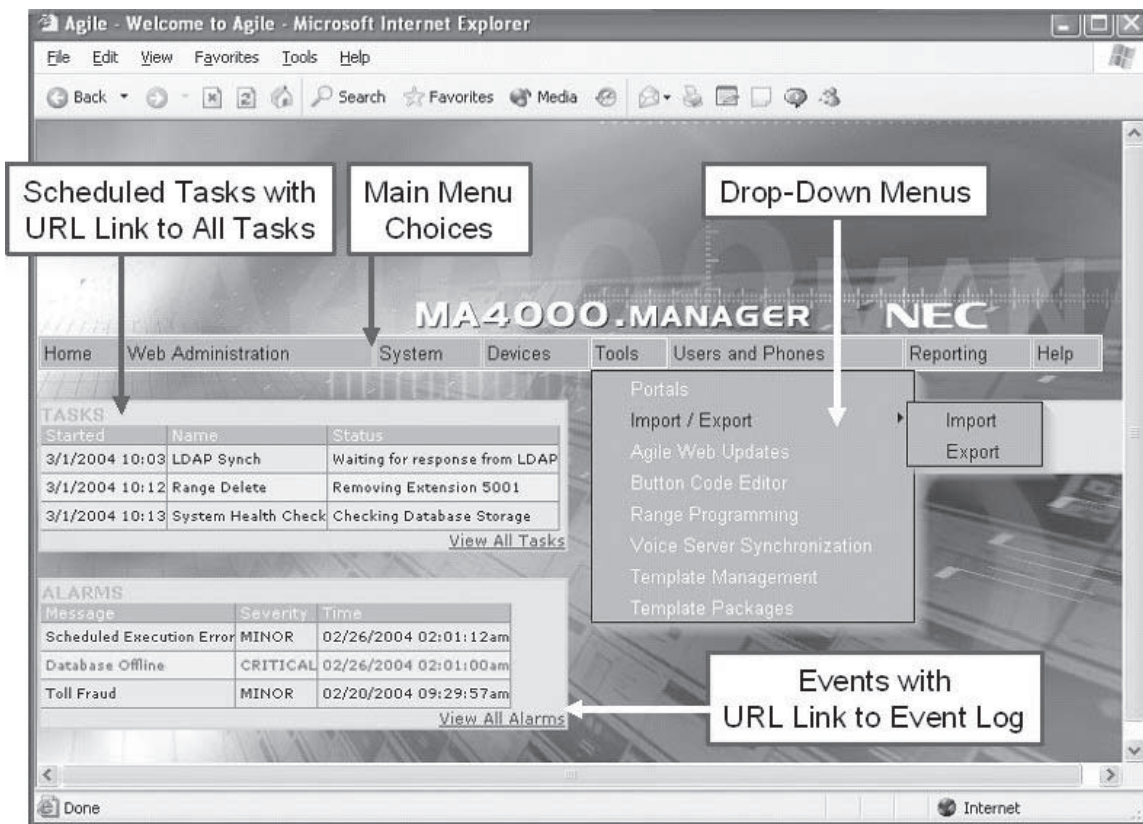


Fig. 1 MA4000 Manager. All functions are accessible via menu.

- Update personal information.
- Update their phone name display.
- Update buttons on their phone for which they have rights.
- Set or change call forwarding.
- Set or change station speed dial.

(3) LDAP Auto Provisioning Module

The LDAP Auto Provisioning module is an optional module to automate moves, adds and changes throughout an organization by allowing a Directory Server or other LDAP version-3 or above application to control the addition of new users.

This module provides the following capabilities, which allows organizations to reduce total cost of ownership by eliminating unnecessary labor charges normally associated with moves, adds and changes:

- It allows IT Administrators to automate moves, adds and changes from an LDAP source to the MA4000 database and to the SV7000 system.
- Administrators can select to have new users added or merely updated based upon a single checkbox and based upon an individual LDAP definition that is defined based upon Base DN, Scope of

Search and any additional filters that might be desired.

- It utilizes a unidirectional synchronization process where the LDAP server is always the source and the MA4000 is the receiver.
- Multiple LDAP sources are supported and multiple definitions can be defined to each individual source.
- Based upon individual LDAP definitions specific templates can be specified that will automatically add specific types of phones with specific attributes (buttons, class of service, call forwarding, etc.)
- Later releases of MA4000 will allow other provisioning to be specified, such as voice mail box, account/authorization codes, location information and more.

This application has been tested with:

- Microsoft's Active Directory
- Microsoft's Exchange Server
- Novell Directory Server eDirectory
- Lotus Domino
- OpenLDAP

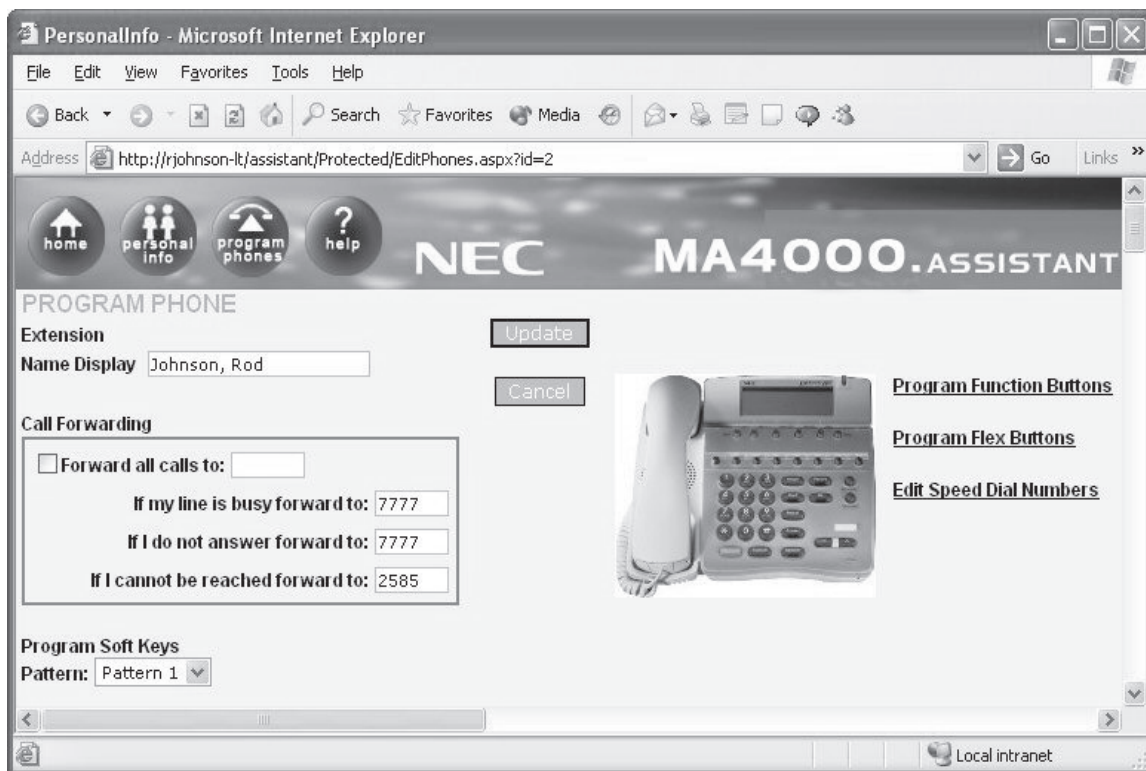


Fig. 2 MA4000 Assistant. Phone users are able to control and program the functions of their phones.

5. LDAP AUTO PROVISIONING OPERATIONAL CONFIGURATION

When setting up the LDAP Auto Provisioning the user will specify connection information that includes:

- URL or IP address of the LDAP server.
- Port number to connect to (normally port 389).
- The User DN. This is the user ID used to login to the LDAP server.
- Password.
- Synchronization time. This is how often the MA4000 will query the LDAP server to check for updates. It can be set in five minutes increments.
- The Base DSN to be searched.
- The Search Scope.
- Any filters that are desired to specify certain types of users such as “Department = Administration.”

Once the LDAP connection information has been defined, the MA4000 will automatically learn the schema of the LDAP server. The user then selects the appropriate fields within the schema that they are interested in mapping to the MA4000 and SV7000 systems.

The fields selected from the LDAP server are then placed within a simple drop-down selection boxes for easy association to the MA4000 fields. This is referred to as “Simple” mapping. “Advanced” mapping is also supported that allows the user to specify mapping criteria by use of VB Scripting.

Once the mapping has been defined, the user will specify the Voice System to make additions/changes to, the appropriate Template Package to utilize when making additions/changes and whether or not new users should be automatically added to the Voice System. If the user selects to not add users automatically to the Voice System then the LDAP Auto Provisioning module will merely update information for existing users.

Figure 3 and **Figure 4** show a few selected screen shots regarding the LDAP Auto Provisioning Operational Configuration.

6. SUMMARY OF MA4000 BENEFITS

The MA4000 Management System provides many benefits to organizations large and small. Among these benefits are the following:

- Increased Security.
- Reduced Total Cost of Ownership.

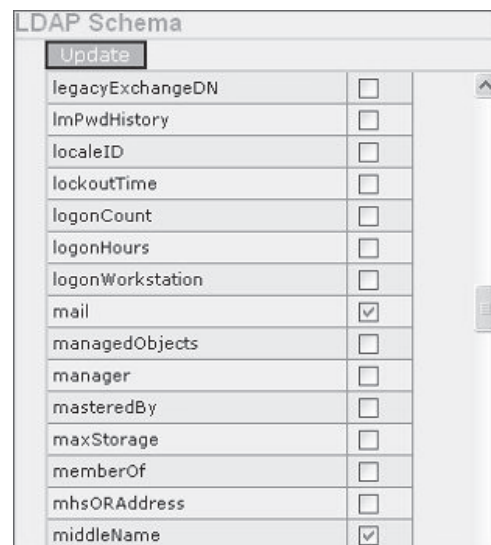
(1) Increased Security

The MA4000 (Nicknamed Agile) provides a secure framework within which management of your UNIVERGE system is simplified.

Security is a critical aspect of any web-based application. MA4000 has several levels of security to prevent hostile intrusions and tampering.

The first level of security is the network infrastructure itself. The MA4000 is designed to be an intranet application protected by your enterprise firewall; therefore only authorized network users on the internal network should have access to the Web Server. If the IT Manager wishes to allow off-site access they are responsible for providing the necessary security.

The second level of security is Authentication using the NEC Centralized Authentication Service (NEC CAS). Every Manager that logs into MA4000 is given an Authentication browser ticket that they carry with them throughout the application. This ticket can be thought of as an Employee ID badge. As the Manager moves through the website this ticket identifies the Manager automatically and MA4000 allows access. Another way to think of it is as a key that opens all doors that the Manager walks up to. This is also known as Single Sign On capability and is discussed further in the section on Authentication.



Selecting Fields within the LDAP Schema to Map to the MA4000 Fields

Fig. 3 Selecting fields within the LDAP schema to map to the MA4000 fields.

The third level of security is the Access Rights assigned to the Manager. The Access Rights associated with a Manager determine the information presented. Access Rights determine which web pages and which fields on the MA4000 web pages are available to the Manager.

In the MA4000 system there are several other forms of security. These forms of security are:

- Data checking to prevent malicious activity such as in java scripts.
- Encryption to keep passwords and sensitive data private and secure.
- Data access limited by using stored procedures.
- Ability to operate via SSL (Secure Socket Layer) encryption using https URLs.
- Security alarms that trigger after a set number of failed login attempts.
- Configurable database usernames and passwords that are not hard coded.
- Support for the latest Microsoft critical updates and security patches.

(2) Reduced TCO (Total Cost of Ownership)

The MA4000 reduces TCO and Total Cost of UNIVERGE System Management in several ways.

To name a few:

- Fast, easy and convenient moves, adds and changes.
- Fast, easy and consistent moves, adds and changes.
- Automatic moves, adds and changes.
- Automatic monitoring of SV7000 health as well as other associated events.
- Scheduled tasks that reduce after-hour expenses.

1) Fast, Easy and Convenient: Moves, Adds & Changes

The MA4000 Management System provides a simple to use, wizard-based interface for performing daily moves, adds and changes that makes the UNIVERGE SV7000 "Fast, Easy and Convenient" to manage.

The MA4000's Range Programming wizard makes it easy to perform adds, changes, copies, deletes, moves, renumbering of extensions and swaps of phones by utilizing a sophisticated search engine that takes the guesswork out of management.

The MA4000 search utility works across multiple systems and allows searches to be conducted on more than ten different user/phone attributes. These

| Agile Field | Copied From | Directory Field or Text |
|----------------|---------------------|-------------------------------------|
| Extension | Macro | =RIGHT(Directory.TelephoneNumber,4) |
| Email | Directory.Email | |
| First Name | Directory.Firstname | |
| Middle Initial | [none] | |
| Last Name | Directory.Lastname | |
| Switch Name | [Text] | IPX |
| Org Level | Parent.Department | |

Template: SV7000 Default Template Package [Edit Template] Is User Created

Switch ID: SV 7000 Tenant: 1

Simple Mapping, Template Selection, User creation & Voice System Selection

Fig. 4 Simple mapping, template selection, user creation & voice system selection.

attributes include any additional manager defined attributes that might have been added to the system (the MA4000 Manager is able to create custom fields within several areas of the system to allow organizational management to conform to the specific business needs of an enterprise).

2) Fast, Easy and Consistent: Moves, Adds & Changes

The MA4000's extensive use of individual Templates and Template Packages not only makes management and administration fast and easy but it also makes it consistent. Such consistency reduces the TCO and operation by:

- Reducing the training of managers who are to perform moves, adds and changes.
- Reducing the training of users who utilize the phones.
- Reducing helpdesk calls related to some feature that should never have been available to the user.
- Reducing the time to install or change a phone or a group of phones because button assignments, call forwarding assignments, class of service assignments, specific user attributes and speed dial memory allocation can be setup once and used repeatedly.
- Reducing the guesswork on how to setup a phone because this was done already when the templates were initially created.

3) Automatic Moves, Adds & Changes

The LDAP Auto Provisioning module can be utilized to perform automatic moves, adds and changes, thus drastically reducing the cost of ownership.

4) Automatic Monitoring of SV7000 system Health

The MA4000 monitors the SV7000 for any events that might create a degradation in service and then immediately notifies those concerned via e-mail or PC

*Microsoft, Windows, Active Directory, and Exchange are registered trademarks or trademarks of Microsoft Corporation in the United States and other countries.

†Novell, and eDirectory are trademarks or registered trademarks of Novell, Inc.

‡Lotus is a registered trademark and Domino is a trademark of Lotus Development Corporation.

§Other names of companies and products in this paper are trademarks or registered trademarks of each company.

Screen Pop to MA4000 Alarm Clients (Alarm Clients are freely distributable). The MA4000 utilizes a highly sophisticated notification procedure that is simple to set up and provides cascading priority of notifications. Cascading prioritization is the ability to require acknowledgement of notification receipt and specify a wait period within which "acknowledgment of receipt" must be received or notifications will proceed to the next level. Multiple notifications may be provided with many different wait periods.

With such automated monitoring and notification capabilities, managers can devote themselves to more productive efforts.

5) Scheduled Tasks that Reduce After-Hour Expenses

NEC understands that there is a time for everything and sometimes you have to take that time whenever you can. That is why the MA4000 supports scheduling of many different functions. Whereas at noon you might have 15 minutes to move those 50 users and phones, it just might not be the most appropriate time to disrupt business operations. So, you can schedule the move to take place after-hours, unattended. Not only did you avoid operational disruption but you also avoided after-hour expenses.

Some of the tasks that can be scheduled are:

- Adds, Moves, Changes.
- Swaps, Renumbering, Deletions, Copies.
- SV7000 Synchronizations.
- SV7000 Time Synchronization.
- LDAP Server Synchronization.

Tasks can be scheduled for one-time operation or for recurring operation.

7. CONCLUSION

Using the MA4000s fast, easy, convenient and schedulable processes helps reduce operational expenses.

With NEC's cost reducing capabilities and track record of providing one of the best meantime between failures in regards to its communication equipment, an organization cannot go wrong with a solution from NEC.

Received September 17, 2004

* * * * *



Rod JOHNSON began his career with NEC in 1995, as a Field Service Engineer for the NEAX 2000 IPS system. He has worked as an Applications Engineer, both for the NEAX 2400 and the NEAX 2000 and is now currently working as a Product Manager managing

NEC's maintenance programs. He has been in the telecommunications industry for more than 25 years and has a variety of experience from outside cable plant to Local Area Networking. He graduated from Northstate University in California with a Bachelor's of Science in Philosophy and Religion.

* * * * *