

Solution Paper

SOLIDserver IPAM for Microsoft

The volume of hardware and virtual devices connecting to the internet and to corporate networks has led to exponential growth in the number of IP addresses required, leading to significant operational challenges. In addition, DNS and DHCP services have become vital for application and network access. Many strategic business tools directly rely upon those services such as VoIP and email. As a result, the performance, reliability, scalability and ease of deployment and administration of these services have become key strategic assets.

SOLIDserverTM IP Address Management solution (IPAM) integrates seamlessly with Microsoft[®] DNS and DHCP servers enabling a unified, automated and policy-driven management for higher security, reliability and scalability of the network infrastructure.

Based on an intuitive and efficient Web-based interface, SOLIDserverTM DDI appliance allows you to streamline resource qualifications and consumption, while maintaining full control of data consistency across the complete IP addressing plans, VLAN organizations and DNS/DHCP architectures. SOLIDserver's high level of automation capacity increases process administration efficiencies, allowing you to simplify the delegation of administrative tasks.

The following is an overview of the primary benefits of EfficientIP solutions in the Microsoft[®] environment.

Agentless IPAM solution for Microsoft[®]

SOLIDserver IPAM for Microsoft is an agentless solution that requires no additional software to be installed on any Microsoft DNS and DHCP servers. EfficientIP's solution can handle all DNS and DHCP records and secure protocols used by Microsoft[®] in order to remotely configure and monitor Microsoft[®] DNS-DHCP services. These protocols, based on strong authentication, integrate the components of the Active Directory architecture and Name Controllers.

Global Visibility for Global Management

SOLIDserver™ stores all information concerning the overall IP address and VLAN plans (IP addresses, IP pools, subnets) as well as Microsoft® DNS and DHCP server configurations in a centralized repository. It provides a single, comprehensive and real-time view of the entire address space deployed over multiple networks, and with address pools and DNS information deployed on multiple DHCP and DNS servers throughout the network.

SOLIDserver™ enables comprehensive access to data across an overall network at a glance, based on user-defined or standard search criteria. Several powerful search engines enable simple or complex searches based on multiple criteria, not only within a server or a subnet but across all data networks. For example, it is possible to identify in just a few seconds all IP addresses allocated to Hewlett Packard servers for which the names start with "sr.x". All assets can be tracked down by IP, hostname, MAC address or user-defined criteria (Ex: vendor, serial number, OS, location, etc.).

This unique approach allows us to drill into the embedded database using customized criteria in order to select specifically requested information, ensuring efficient management aligned with operational needs.

There are no more hierarchical arborescence constraints which limit the user's browsing abilities to a branch-by-branch or server-by-server basis. For example, SOLIDserver™ can display all IP addresses of all subnets or all zones of all DNS servers. Advanced search capabilities associated with these cross-browsing features allow powerful access to appropriate information.

DDI Data Consistency, Integrity and Uniqueness Control

SOLIDserver™ ensures the consistency of user-established configurations by verifying the entered data and its coherence in your network.

SOLIDserver™ eliminates IP address conflicts such as duplicate IP addresses, subnet overlapping, naming errors or overlaps between DHCP services. Thus, SOLIDserver™ helps to prevent configuration errors and guarantees the integrity and the reliability of DNS and DHCP servers.

Unified Management of IP-VLAN Plans with DHCP-DNS Services

SOLIDserver™ is a unified management solution that enables you to manage and deploy IP addressing plans and VLANs with DNS and DHCP services from a single tool and in one operation.

It is possible to create, in one operation, a /24 subnet with a range of IP addresses allocated through DHCP service. All configurations will be automatically carried out by SOLIDserver™ on remote defined DNS and DHCP servers and will configure DNS and DHCP services according to specified options. The SOLIDserver™ GUI displays all information in a single view for immediate access. DNS, DHCP, VLAN and IP plan data are easily consolidated.

Similarly, the manual allocation or deletion of an IP address in the subnet will automatically update DNS service configurations by creating or deleting A, PTR and CNAME records on the appropriate DNS server(s).

SOLIDserver™ ensures dynamic and integrated management of IPAM with DNS and DHCP services in a single process, ensuring the highest level of quality and efficiency.

Mass Updates Across All Networks and Servers

The Microsoft® management tool, MMC, enables server-by-server management of DNS and DHCP services. This means that the ability to make modifications on several servers at the same time is very limited.

Based on a centralized repository and cross-browsing capability to access data across the entire infrastructure, EfficientIP has eliminated hierarchical arborescence dependencies which limit the management of a network to a branch-by-branch and server-by-server basis. It is possible to simultaneously browse, select and manage all subnets dedicated to VoIP on several networks and DHCP servers and change their options in one operation. It is now one easy step to identify all resource records of all DNS zones of all DNS servers for which a TTL must be changed. For example, in a matter of a few seconds, all IP addresses allocated to HP printers can be identified and selected to modify their names.

Full Support of GSS-TSIG for Secure DNS Management

The access control to process the Microsoft® DNS updates is based upon Microsoft's® mechanisms. SOLIDserver™ uses the DDNS (RFC2136) protocol with the GSS-TSIG algorithm to secure it.

To initiate a secure dynamic update, SOLIDserver™ first initiates the TKEY negotiation process with the DNS server in order to establish a security context (SOLIDserver™ and the DNS server verify their respective identities). Next, SOLIDserver™ sends the dynamic update request containing the resource records to add, delete, or modify to the Microsoft® DNS server, using the security context and signed with the TSIG key. The DNS server checks the origin of the dynamic update using the security context and the TSIG key. Finally, the Microsoft® DNS server attempts to update Active Directory on behalf of SOLIDserver and will send a reply (signed with TSIG) to SOLIDserver stating if it was able to make the update.

SOLIDserver™ integration requires only creation of a user account in Active Directory, in order for SOLIDserver™ to perform a secure update.

Smart Architecture™: Managing Network Services Architecture

SmartArchitecture™ is a new approach to IPAM and DNS-DHCP services management designed to drastically simplify deployment and administration of your network services. Thanks to SmartArchitecture™, EfficientIP offers the capability to deploy and manage your DNS-DHCP services at the architecture level.

SmartArchitecture™ is a library of state-of-the-art templates of DNS-DHCP architectures, applied on a group of Multi-Vendor servers (Microsoft®, Open source, SOLIDserver) to automatically deploy and manage the architecture as a single entity.

Based on the selected SmartArchitecture, the SOLIDserver centralized management platform will automatically configure all DNS-DHCP servers belonging to the SmartArchitecture™ according to their individual role within the selected template. It is no longer necessary to manually configure each server in order to build the DNS-DHCP architecture; the entire process is now carried out automatically.

SmartArchitecture™ Key Benefits:

- Increase reliability and security of your network services by automating enforcement of DNS and DHCP best practices.
- Eliminate deployment complexity: Automate deployment of DNS and DHCP architectures.
- Ease of Management: Simplify the management of network services by directly managing the architecture and automating all server configurations of SmartArchitecture™
- SmartArchitecture™ Motion: Easy architecture migration and reorganization with “Drag and Drop” functionality.

SmartArchitecture™ is a breakthrough in network services management efficiency, bringing unmatched levels of reliability, scalability and flexibility. SmartArchitecture™ enables you to perform complex administration tasks very easily and in just a few minutes. Migration of Master/Slave to Stealth or multi-Master is automatically done by selecting the ad hoc SmartArchitecture™ to apply on the DNS servers. It is now easy to add or remove DNS servers from the architecture; the centralized management appliance will automatically manage all configuration file modifications.

Update Microsoft Multi-Masters DNS Architecture in Real Time

SOLIDserver automatically updates your multi-masters Microsoft® DNS servers by an authentication in the Domain Controller. These modifications are instantaneously taken into account and are ready to use on your servers without having to wait for synchronization with the Active Directory.

Resolution of Search List Issue with Multiple Domains

It is difficult to locate a device based on its Hostname when several domains are defined. Each domain needs to be requested in order to establish which domain is associated with which device.

SOLIDserver resolves this issue by automatically creating a record of all domains for each one, and a CNAME record in one specific domain. For instance, a DHCP client with the host name pc1 registered in the newyork domain (FQDN: pc1.newyork) will automatically have a CNAME

«pc1.admin» created. Similarly, pc2.houston will have a CNAME «pc2.admin» created. It is thus very easy to find the information by searching only in one domain.

Naming Protection

SOLIDserver can control whether or not a DHCP client is authorized to update a DNS server according to user-defined rules:

- Hostname uniqueness control
- FQDN uniqueness analysis
- FQDN filtering: i.e. DHCP leases are authorized to be registered in DNS if they are compliant with some specific name structures (ex: pcxxx.lan01)
- Ensures that a dynamic address may not overwrite a name of a static IP address, such as an application server or printer.

Microsoft Disaster Recovery Process

SOLIDserver™ enables simple, fast and secure disaster recovery processes. SOLIDserver™ stores all required information for multi-vendor DNS and DHCP services recovery in its embedded database.

For example, in case of a Microsoft® DHCP server crash SOLIDserver™ can push the complete configuration of the crashed server onto a new server, with the exact configuration it had just before the crash. In a short period of time the DHCP service will be up without painful administration tasks. All risks of conflicting IP address allocation are eliminated.

Multiple IP Addressing Plan Management-Overlapping Address Spaces Management

SOLIDserver™ enables you to manage an unlimited number of overlapping identical IP addressing plans. Each IP plan can be seen and managed independently from the others in a dedicated IP Space. The coherency, integrity and uniqueness of IP resources are ensured within an IP Space. It is also possible to create links among IP Spaces to simplify NAT management among networks.

DNS and DHCP servers are associated with one specific IP Space and are thus managed with a comprehensive consistency control with the IP plan.

This is an important functionality especially following an acquisition or merger of companies with identical IP addressing plans. In that situation it is mandatory to manage all IP spaces of the global network from the same centralized point. This is possible with SOLIDserver™ IP Spaces.

Flexible and Scalable IP Plan Modeling

The IP addressing plan is the foundation of the network upon which network services are organized and deployed. The IP addressing structure can be defined according to one or several criteria which can be technical, administrative or organizational. As a consequence, one of the fundamental requirements for an efficient IPAM solution is to ensure the possibility to model existing and future IP plan organizations according to your needs and criteria.

Flexibility and Scalability: SOLIDserver™ enables you to model an IP addressing plan precisely and easily, according to multiple criteria. It is possible to mix and match models to construct a tailor-made address structure for your company. There is no limitation on the number of levels and depth that can be defined in the IP plan. All branches of this tailor-made tree structure can be independent if needed. This makes it fast and easy to design and manage VLSM subnets (Variable length Subnet Masking). The flexibility of hierarchical tree structures certifies the ease of modifications. It is possible to reorganize, extend, and migrate IP addressing plans according to the evolution of your enterprise.

Engineering Rules applied on the IP Addressing Plan: Hierarchical IP structures enable you to define specific properties, attributes and constraints to be applied to resources and objects, such as name and size, for each level of the IP addressing plan. Properties of the resources can be inherited from a level to a sub-level, to be included in a hierarchical organization of engineering rules mapped on the hierarchical IP plan structure. This unique and unequalled approach allows you to adapt your IPAM tool not only to your specific IP plan structure but also to your engineering rules of resource deployment, applied to each level of your IP plan.

IPAM Web Portal «On Demand» to Match with Relevant Operational Criteria

Efficiency of administration relies upon the capability to browse, list and select resources across the entire database. As a consequence this efficiency is directly linked with the flexibility of the interface of administration tools in order to display appropriate information. The SOLIDserver™ web interface can be fully adapted to customized needs in order to list relevant information from IP resources.

Each user defined attribute of a resource, such as phone number, serial number or location, can be displayed with the listing of IP data. An administrator can add or remove displayed attributes for each type of object: subnets, zones, scopes, addresses etc... For example, it is possible to list administrative information associated with a list of IP addresses such as the building and floor number or support phone number of a network for each subnet of the subnets list. Each attribute has an autonomous search engine. The search criteria can be refined by using functions such as “match strictly”, “different from”, or “strictly over”. It is possible to easily identify all IP addresses allocated to printer objects with a name that starts with “pr-us-ny” across all networks.

The unrestricted browsing capabilities across the entire server architecture associated with the user-defined web portal are fundamental and necessary features which bring flexibility and simplicity to services deployment according to operational needs. The IPAM Web portal builder warrants the adaptability and scalability of our solution and therefore ensures the durability of your investments.

Resource Qualification Is Under Control Thanks to Object Templates

Daily network operations require deployments of IPAM resources with both speed and coherency. One of the most important issues of collaborative tools is to ensure that everybody respects defined methods.

Customizable Forms for Resource Qualification: SOLIDserver™ delivers a unique solution enabling you to graphically create unlimited numbers of partially or fully customized templates of forms for network objects. Each template, known as «Class», can have a specific

list of fields such as a MAC address, phone number or whatever has to be qualified by the user according to your company's needs.

For example, it is possible to create an Object Class for printers with only a few fields to be qualified, MAC address, vendor and host name. A field can be for instance a free text, a menu list, or a constrained structure such as MAC address structure or naming convention for the naming of an IP address. For example all IP addresses allocated to printers will be automatically named «pr-dept-xxx».

Templates of forms in SOLIDserver™ can formalize qualification processes of IPAM resources in order to:

- Streamline resource qualification
- Streamline resource consumption
- Guide users and mask process complexity to simplify delegation

Object templates («Class») can be created and applied to all resources: Subnets, Pools, server or Zones. The potential for the creation of different fields or menus is endless.

GUI Studio: User-defined Templates of Resources

The GUI Studio™ module is powerful Drag and Drop tool to allow you to create specific templates of forms for your IP resources in only few minutes (Printer, server, VoIP scopes, External DNS zone etc...). SOLIDserver™ streamlines your IP addressing & naming plan by controlling the qualification of the registered data according to tailored rules. Each partition of the addressing plan can have its own rules of documentation and its own methods of organization. It is then possible to ensure a uniform working method with all administrative teams.

Network Organization with Templates

SOLIDserver™ enables you to create templates of networks for automating and streamlining subnet creations. The administrator can select a template to apply and all specific properties of the template will be applied to the subnet and objects inside the subnet (ex: IP ranges for server, printer, DHCP). It is possible to restrict access to only authorized IP address templates for each IP range

of the subnet. For instance, authorize only the use of a Printer template for IP addresses within a Printer range.

Similarly, it is possible to create dedicated templates for VoIP subnets with specific predefined options, size, naming conventions or DNS templates for internal or external zones.

Active IP Address and Port Tracking for IPAM Reconciliation

The integrity of your IT data is of great value to your company. EfficientIP's solutions supply powerful network discovery tools to automatically document IP address attributes and provides precise and comprehensive views of network connections (Switch/Port/VLAN/Name/MAC). NetChange-IPLocator™ discovers the physical and logical topology of the network infrastructure, bringing a real capacity to watch over, follow and control the location of your IP addresses' devices.

Dynamic Devices Self Documenting: For all IP and MAC addresses discovered, NetChange-IPLocator™ will identify the following key information: switch name, switch slot, switch port, switch description, switch OS version, VLAN number, switch status, port speed, link status, first seen and last seen.

History of IP/MAC Addresses Mobility: NetChange-IPLocator™ identifies and archives any changes in IP or MAC address location on the network. It brings a global view of the mobility of the company's stations by address offset -switch, slot, port and VLAN offset of an IP and/or a MAC address. The displayed, archived information shows when, where and who was connected and remains connected so that IP and MAC mobility can easily be tracked.

IPAM Reconciliation: NetChange-IPLocator™ enables you to compare the theoretical IP address locations defined in SOLIDserver's™ IPAM repository with the discovered information. At a glance, it is easy to identify inconsistencies and receive alerts by email. Advanced reports supply a simple, comprehensive and summarized view.

Remove Infected Devices: Based on discovery results, it is easy to locate and remove an infected station in order to provide optimal reactivity to security alerts.

Reclaim Unused IP and MAC Addresses: EfficientIP's discovery process can identify IP and MAC addresses that have been unused during a given laps of time. Based on this information it is easy to determine whether IP addresses can be released or reallocated.

Control IP Port Occupancy Rate: EfficientIP's discovery process can identify any switch ports which have been unused during a defined period of time as available for release or reallocation. This is particularly important in the context of datacenters helping to avoid overconsumption of Giga Ethernet ports to unused servers.

Discover Unauthorized Devices: Discoveries made by NetChange-IPLocator™ can send alerts when an unknown device is detected on the network.

Control Who Can Do What, How and When

Bring Users' Responsibilities in Line with Right Delegation: SOLIDserver™ structures the delegation of administration in a precise and methodic way, according to your organizational context. SOLIDserver™ adapts to all management policies, allowing you to create unlimited user profiles. Granular or very specific delegation rights enable you to implement a hierarchical and/or matrix organization. There are no more hierarchical arborescence dependences forcing you to delegate the administration network branch by branch and server by server. Thanks to this approach, the company's organization is implemented transparently and independently according to the specific requirements of each SOLIDserver user.

For example it is possible to create a group of administrators which have a restricted access to IP pools dedicated to printer objects across all subnets.

Control Deployment of Authorized Objects: SOLIDserver™ enables you to control the templates that can be applied by users on IP addresses, subnets and all IP resources. For instance a printer group will not have the possibility to deploy other object templates than the printer template. In this case, SOLIDserver™ will enforce the use of dedicated templates for printer objects. Users are easily guided and administration processes are streamlined.

Adapt Product Interface according to Level of Privileges: In compliance with to the user's rights, the user interface will be automatically profiled in order to simplify the navigation, the reading of the information, and

the user's interactions. A group of users which only have reading rights will not be able to see menus that allow the creation or deletion of resources.

Historical of Administration Tasks: SOLIDserver™ logs all administration tasks carried out, both manually operated by users and automated by SOLIDserver™, enabling advanced searches by user, object type and date.

Secured Users Authentication: User authentication can be carried out locally by SOLIDserver™ or remotely on an external authentication server such as LDAP, Active Directory, and RADIUS.

Work Flow Management

Unify Collaborative Processes: SOLIDserver™'s Work Flow offers a unique methodology for streamlining request management processes. SOLIDserver™ enables several groups of administrators to work around the same IPAM repository and share mutual work methods.

Requests are defined in forms. The content of each form depends on the type of request and can be fully customized with graphic tools to fit with your company's requirements. Basically a request is identified by a serial number, requestor, addressee, requested object type, request status, creation date, and last modification date. The request life cycle can be easily managed and followed-up by users thanks to the request status -"accepted", "refused", "cancelled", "in progress".

For example a user group can submit a request to a Super user team for subnet extension. The Super user team will check the request and can validate or refuse it. After the approval step, the new subnet is allocated to the request either automatically or manually. Requestor is informed of the request approval and can use this new resource.

Store Request and Assignment History: All information related to IP resources attributions is stored and available in the SOLIDserver™ database. Users can query this knowledge database to obtain a record of the cumulated requests. The database can be searched according to multiple criteria: by user, by references, or by type of actions.

Reports and Services Monitoring

Reports on Demand: EfficientIP's solutions supply a variety of reports on IPAM, DNS, and DHCP services, enabling you to have a pro-active analysis of service consumption and trends. Reports are a powerful tool in order to control capacity planning and get a real understanding of how network resources are used. Reports are also important information to help deal with and anticipate problems such as an unusual number of DNS queries revealing a DNS attack. The catalogue of reports can be extended with customization. SOLIDserver™ delivers all required information and tools to create customized reports matching exactly administrator-defined needs.

Service Monitoring: EfficientIP's solution enables you to precisely monitor services and system parameters, such as DNS query reports, DHCP request reports, or CPU load.

Threshold Alerts: Thresholds can be configured on services and systems such as DHCP scopes occupancy rate. Alerts are given by an automated email or SNMP traps for preventive or corrective actions.

ABOUT EFFICIENTIP

EfficientIP solutions address organizations' needs to drive business efficiency through the innovative use of IT. Its unified management framework for DNS-DHCP-IPAM, devices and network configurations enhances security, availability and agility of the IT infrastructure. EfficientIP's solutions have been chosen by hundreds of the most demanding organizations across all industries.

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