

Market Guide for DNS, DHCP and IP Address Management

25 April 2014 ID:G00262756

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VIEW SUMMARY

Infrastructure and operations personnel can use DNS, DHCP and IP address management solutions to improve network availability, reduce operational expenditure, and simplify and streamline administration of critical infrastructure.

Overview

Key Findings

DDI consists of DNS, DHCP and IP address management (IPAM) solutions that help organizations manage their IP addressing, DNS and DHCP services to improve overall availability and reduce operational expenditure, thus facilitating scalability to support business growth.

There are several different types of vendors that provide DDI, ranging from large IT vendors (Microsoft, Cisco, Alcatel-Lucent and BT) to midsize DDI-centric vendors (Infoblox and BlueCat), as well as smaller and/or regionalized players (EfficientIP, Nixu Software and Men & Mice).

When deploying a commercialized DDI solution, organizations with more than 5,000 employees and/or 25,000 IP addresses in use typically achieve substantial operational expenditure (opex) savings.

Organizations don't often switch vendors due to the criticality of DNS and operational expenditure associated with vendor migration; therefore, DDI solutions tend to be sticky.

The DDI market is relatively mature, and many DDI vendors provide functionality in adjacent markets, such as network security and network management.

Recommendations

If instability of DNS/DHCP services or inadequate IP address management is leading to reduced availability in your environment, invest in DDI solutions.

Deploy DDI solutions to improve availability and reduce opex when 25,000-plus active IP addresses are in use.

Due to the stickiness of DDI products, use a five- to 10-year time horizon when planning investments in DDI.

Vendors' deployment and migration approaches should be used as key evaluation criteria when making DDI investments.

Include DDI as a prerequisite to any large IPv6 deployment or centralized Internet of Things (IoT) initiative.

Market Definition

DDI solutions improve overall IT infrastructure availability while reducing operational expenditure. These solutions specifically address the needs of server, network and other infrastructure and operations (I&O) personnel responsible for DNS, DHCP services and allocation of IP addresses within their organizations. I&O administrators use DDI products for the daily management of DNS and DHCP services, and to provide a structured workflow for basic network operations (for example, adding printers or servers, allocating IP ranges for new branches, etc.).

Companies adopt DDI solutions when they are looking to step up from using rudimentary tools (i.e., spreadsheets) to manage IP addresses, and when they seek improved control and policies for managing network changes. Gartner estimates that usage of a commercial DDI solution can reduce opex by 50% or more, which can lead to savings of full-time equivalents (FTEs) in larger organizations (see Note 1). As a result, Gartner has observed that a majority of organizations with more than 15,000 employees (or 50,000 IP addresses in use) use a commercial DDI solution.^{1,4}

DDI solutions are typically priced like a networking device, including a one-time initial hardware/software price and a yearly recurring maintenance fee. Price can vary significantly based on several factors, including deal size and volume (i.e., number of IP addresses managed), overall topology/architecture, vendor, and negotiated discount rate. Vendors' list pricing typically ranges from \$1 to \$3 per IP address for the initial hardware/software purchase, plus an additional yearly maintenance fee in the range of 15% to 20% of the original hardware/software price.

Market Direction

I&O organizations typically make investments in DDI to:

Improve existing IP address management capability and processes.

Improve the stability of DNS and/or DHCP infrastructure, in order to increase overall availability for the applications and users that rely on this infrastructure.

Upgrade or replace a previous DDI solution that is coming to end of life.

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EVIDENCE

¹ This is based on 1,000-plus interactions with clients regarding networking over the past year.

² This is based on interactions with the nine leading DDI vendors referenced in this document.

³ Gartner analyzed survey responses from 56 organizations utilizing DDI solutions in their environment. These organizations were provided as reference customers by the vendors participating in this research.

⁴ This is based on over 130 client interactions regarding DDI over the past 15 months.

⁵ Y. Gu, "Google Public DNS Now Supports DNSSEC Validation," Google Public DNS, 19 March 2013.

NOTE 1 TYPICAL OPEX SAVINGS DERIVED FROM DDI

This is based on typical usage and administration of DNS, DHCP and IPAM at large global organizations, and has been validated with clients that have implemented DDI solutions. Assumptions for this model include:

Rate of change (per month) in the environment: 5% for DNS, 4% for DHCP and 2% for IP subnets/VLANs.

Typical organizations require three to five IP addresses per user.

Typical organizations utilize three application environments (development/test, quality assurance and production) with multiple data centers and distributed branches.

Manual DNS administration time can be reduced from two to 10 minutes to half a minute to five minutes per change.

Manual DHCP administration time can be reduced from four to 15 minutes to half a minute to five minutes per change.

Manual IP address management administration time can be reduced from 15 to 60 minutes to one to 20 minutes per change.

Delegate DNS and/or DHCP administration from senior to less experienced administrators.
Help support and control a proliferating number of devices, including your own device (BYOD), attaching to corporate networks.
Improve visibility and reporting for devices attached to the network.

Gartner estimates there are approximately 10,000 to 15,000 commercial DDI solutions implemented globally and that 85%-plus of the 500 largest global enterprises utilize commercial DDI solutions.^{1,2,4} There is a moderate degree of market fragmentation, as we estimate that no single vendor accounts for more than 45% of the worldwide DDI installed base, while four vendors account for roughly 4% to 12% each.² In addition, deployed DDI solutions are often difficult to displace as: (1) they are sticky, due to DNS criticality; and (2) organizations often wrap organizational process and technology around them (i.e., integration into ticketing systems and workflows). As a result, the planning and costs associated with migrating existing DNS/DHCP services are extremely important to consider when a new DDI solution is being proposed.

In the small or midsize business (SMB) market, the need for DDI is dramatically reduced due to the lack of scale in IP services. In addition, Microsoft's DDI solution (which is provided at no additional cost with Windows Server 2012 R2) satisfies many SMB DDI needs.

Additional DDI Drivers

There are several additional drivers impacting the DDI market, including automation, DNS Security Extensions (DNSSEC), IoT, IPv6, software-defined networking (SDN) and adjacent network services.

Advanced Automation to Enable Private Cloud

Several DDI vendors have integrated their solutions with leading hypervisor and cloud management platforms (CMPs) in the hopes of getting "baked into" private cloud initiatives. These integrations are aimed at automating the DDI processes (for example, changes to DNS zone files) that result from spinning up and spinning down virtual servers. Only the most advanced private cloud environments have implemented this level of automation. Gartner estimates less than a 5% adoption rate for these advanced automation features among DDI customers.

Bottom Line: Most enterprises are not quite ready to take advantage of the automation capabilities provided by DDI solutions, because their private cloud implementations don't require automating changes to DNS services. However, where these changes are required, DDI integration with the virtualization infrastructure (i.e., hypervisors, CMPs, etc.) is a valuable capability that can further automate private cloud implementations.

DNSSEC

In recent years, the U.S. and other governments have mandated the adoption of DNSSEC, which is aimed at preventing DNS cache poisoning attacks. Despite these mandates, DNSSEC has a low adoption rate. Statistics from Google indicate a low volume of DNSSEC transactions (only 7% of client-side queries are DNSSEC-enabled, and about 1% of server-side responses are signed).⁵

Bottom Line: All the vendors in this research have added features to help enterprises implement DNSSEC. However, due to its low adoption rate, DNSSEC has not been a driver for DDI adoption.

Internet of Things

Gartner estimates that the IoT will result in over 26 billion units by 2020. IoT initiatives require a massive number of devices (often millions), and centrally managing IP services at this degree of scale requires robust DDI solutions. The IoT drives increased interest in and additional need for commercial DDI solutions (see "The Impact of the Internet of Things on Data Centers"). However, many initial IoT initiatives will be deployed in a decentralized fashion, leveraging IP services from the local networks where devices reside — which reduces the need for robust DDI.

Bottom Line: Clients undertaking IoT initiatives that require centralized IP services will require DDI, and Gartner anticipates moderate growth in the DDI market as a result of IoT during the next 18 months.

IPv6

Worldwide adoption of IPv6 is limited and, by most estimations, global Internet IPv6 traffic is around or under 3% (but has doubled in the past six to 12 months; based on the percentage of [users who access Google via IPv6](#)). Organizations that are undertaking large IPv6 initiatives will likely require DDI due to:

Difficulty in notating IPv6 addresses versus IPv4

The massive number of IP addresses associated with any v6 implementation (best practices dictate that each network segment is assigned over 65,000-plus usable IP addresses)

However, most organizations plan to limit initial IPv6 deployments to public-facing Internet networks only.¹ This incremental approach limits the additional requirements for DDI in most organizations.

Bottom Line: All the vendors in this research have added IPv6 functionality, and DDI solutions simplify IPv6 rollouts. However, Gartner anticipates limited overall DDI market growth due to IPv6 adoption during the next 12 months (see "Create the Right IPv6 Road Map for Your Organization").

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Gartner defines SDN as a new approach to designing, building and operating networks that brings a similar degree of agility to networks as abstraction, virtualization and orchestration brought to server infrastructure (see "Ending the Confusion About Software-Defined Networking: A Taxonomy"). SDN provides a potentially new way to deliver peripheral network services — including DDI. However, to date, DDI vendors are not delivering their commercial DDI software via SDN architectures. In addition, while there has been a large degree of hype around the technology, there has been extremely limited mainstream adoption of SDN thus far. As of January 2014, Gartner estimated that there are less than 500 production implementations worldwide (see "Mainstream Organizations Should Prepare for SDN Now").

Bottom Line: Gartner anticipates that SDN will lead to new deployment approaches for DDI, but will not drive increased DDI adoption during the next 18 months.

Adjacent Network Services

Several DDI vendors offer adjacent network services that are either included or tightly integrated with their core DDI products. Examples of these services include:

- Limited or "lightweight" network access control (i.e., a captive portal for guest networks)
- Limited or lightweight network change control management (i.e., a device to switch port tracking)
- Device fingerprinting
- DNS firewalling

These peripheral features are typically basic or lightweight capabilities, versus a dedicated solution. However, they can provide a "good enough" solution if there are inadequate funds available for a more fully featured or enterprise-class product in these areas.

Bottom Line: DDI vendors will continue to promote and release adjacent features, but Gartner anticipates adoption of these features will remain limited.

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Market Analysis

DDI solutions are typically deployed via three general methods: management overlay, integrated services and managed services.

Management Overlay

DDI overlay-based deployments are meant to complement, not replace, existing DNS and DHCP services. They are simpler to deploy than bundled solutions, which require the integration and/or replacement of the existing DNS/DHCP infrastructure. Overlay solutions provide help in two areas:

- Adding enterprise management capabilities to DNS and DHCP
- Adding IP address management functions

The solutions are modular in nature, so enterprises can choose to deploy only IPAM, only DNS/DHCP management or an integrated DDI solution. Gartner estimates 10% to 20% of commercial DDI implementations fall into the management overlay category. Many clients deploy DDI in a phased approach, starting with the management overlay first (often just IPAM), before moving on to a full-blown bundled implementation.

Bundled Offerings

In a bundled DDI offering, DNS and DHCP services share an integrated database. Bundled solution vendors provide IPAM via two models — as an embedded function or an optional component. Integrating DNS, DHCP and IPAM functions improves workflow tasks and the manageability of the IP address space, and reduces the risk of human error in today's largely manual process. Some vendors have based their solutions on open-source DNS and DHCP, and others have developed their own services. Gartner estimates that the majority (80%+) of commercial DDI implementations are deployed as a bundled solution, which are available in the following form factors:

- Software-only — run on Windows and Unix/Linux systems.
- Hardware appliances — purpose-built appliances that run DNS/DHCP and IPAM functions. Several of the appliance solutions are based on open-source DNS/DHCP and have added high-availability and turnkey enhancements.
- Virtual appliances — software that runs on top of the leading hypervisors.

Managed Services

Managed DDI services are available for organizations that want to "hand off" the day-to-day operations and management of their DNS and DHCP infrastructure. DDI managed service vendors typically deploy appliances on their customers' premises and then manage DNS and DHCP services remotely. The managed service model appeals to organizations and midsize businesses that do not have DNS/DHCP expertise in-house, or simply do not have the resources for managing these critical services. Gartner does not see a large installed base for these managed DDI services. This deployment model is typically priced via a single monthly fee for hardware, software, maintenance and managed services.

Representative Vendors

The vendors listed in this Market Guide do not imply an exhaustive list. This section is intended to provide more understanding of the market and its offerings.

Alcatel-Lucent

Website: <http://enterprise.alcatel-lucent.com/?product=VitalQIP>

Founded: 1898

Alcatel-Lucent (ALU) is a large multinational telecommunications company with over \$19 billion in total revenue in FY13. The vendor's VitalQIP DDI product is one of longest-standing on the market, dating back to the mid-1990s. The VitalQIP product falls under Alcatel-Lucent's Enterprise business unit, which is in the process of being acquired by China Huaxin (see "Alcatel-Lucent's New Focus Prompts Enterprise Deal With China Huaxin"). The sale is pending government and regulatory approvals, and could lead to several possible outcomes for the DDI product, including:

On the positive side, a renewed focus and interest in enterprise DDI, leading to increased investments in R&D, sales/marketing and support

On the negative side, being sold off or possibly discontinued if investments are targeted elsewhere

Alcatel-Lucent has traditionally targeted very large enterprise and service providers with its DDI product, and it has been deployed in a number of large-scale environments. VitalQIP customers often cite overall product flexibility (enabled by a full-featured API) as a key strength.

However, some VitalQIP customers report a lower level of satisfaction versus leading competitors, including concerns over pricing.^{3,4} In addition, VitalQIP does not support network switch port identification, which several of the leading DDI competitors do.

Use Case: Very large enterprise and service providers should consider VitalQIP after vetting the updated DDI product road map per the China Huaxin acquisition.

BT

Website: <http://www.btdiamondip.com>

Founded: 2001

BT Group (BT) is a global communications service company with over \$27 billion in total revenue in FY13. Diamond IP is the vendor's DDI offering, and it is available as software, an appliance and in a virtual environment on VMware ESX. Diamond IP is aimed primarily at the enterprise market, and the vendor sells the product directly and through its value-added reseller (VAR) partners. BT's Global Services division has developed IPv4/IPv6 migration planning and other service offerings around Diamond IP. Diamond IP is a very scalable solution, which enables BT to sell it to service providers (as disclosed by BT, approximately 15% of Diamond IP revenue comes from the service provider market). Diamond IP addresses all three market categories: overlay, bundled and managed services (through parent company BT). The overlay solution manages BIND and Microsoft DNS, and can also manage ISC DHCP and Microsoft DHCP, as well as its own DNS/DHCP services.

Diamond IP's strengths are in features that appeal to large enterprises, including templates for automating the deployment of remote locations, tiered administration and a reconciliation capability that can automate the recovery of unused address records. Network discovery and the ability to map endpoints to network switch ports are included as core IPAM features.

As a multibillion dollar service company, BT does not invest a lot of marketing resources in the Diamond IP product, which has resulted in weak name recognition and a smaller installed base for Diamond IP versus leading competitors.

Use Case: Large enterprises should consider Diamond IP, but the focus on large enterprise requirements makes it a less attractive option for midmarket and smaller organizations.

BlueCat

Website: www.bluecatnetworks.com

Founded: 2001

BlueCat is a private company and pure-play DDI vendor based in Toronto, and Gartner estimates it accounts for roughly 10% of the global DDI installed base. BlueCat supports integrated deployment of DNS and DHCP services, as well as overlay support for Microsoft DNS/DHCP services via its Address Manager appliances. BlueCat's products are available via virtual or physical appliance, and can also be run on existing network infrastructure, including the Citrix NetScaler SDX application delivery platform, and routers from Cisco and HP.

BlueCat targets larger organizations that require significant scale and flexibility. In addition, it offers a high degree of customization that allows organizations to tailor user interfaces and self-service portals for specific requirements. Customers often cite support and customizability as key product differentiators versus leading competitors. In addition, BlueCat supports captive portals for guest networks and improved management of mobile devices via fingerprint functionality and partnerships with leading MDM vendors.

Compared with leading DDI companies, BlueCat does not aggressively target midmarket enterprises with their solutions. In addition, some customers indicate that the ease of use of certain functions lags the leading competitors.

Use Case: Large organizations should consider BlueCat, particularly in environments with significant scale requirements (100,000-plus IP addresses) or that desire significant customization.

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Cisco

Website: www.cisco.com

Founded: 1984

Cisco (CSCO) is one of the largest worldwide IT companies with over \$48 billion in total revenue in FY13. In the DDI space, Cisco has traditionally targeted large global network operators, including service providers and cable network operators, and provides DNS and DHCP services that can run as hardware or virtual appliances.

Cisco's Prime Network Registrar DDI offering provides leading DHCP performance at scale and is used in some of the most demanding of DHCP environments (such as residential cable broadband providers). Cisco provides IPAM capability via an OEM partnership with BT for its BT Diamond IPcontrol software. However, not owning the IPAM function puts Cisco at a disadvantage with its competitors, which can react more quickly to market trends. Due to these limitations, and Cisco's lack of marketing focus on DDI, the solution has limited brand awareness in mainstream enterprises.

Note: In March 2014, Cisco released a new product aimed at mainstream enterprises called Prime IP Express. Due to the timing of the announcement, Gartner was unable to include IP Express in the scope of this research.

Use Case: Service providers and organizations that require the highest level of DHCP performance should consider Cisco.

EfficientIP

Website: www.efficientip.com

Founded: 1997

EfficientIP is an emerging privately held, pure-play DDI vendor based in France that has recently expanded into the North American market. Its SOLIDserver delivers DDI capability via software or hardware, supporting both overlay and integrated deployment of DNS and DHCP services (DNS support is provided for Microsoft, BIND, NSD and Unbound).

Customers typically cite the EfficientIP product as being cost-effective, easy to use and flexible/customizable. In addition to core DDI functionality, EfficientIP supports lightweight network access control (NAC) and network configuration and change management (NCCM) capabilities. Although the vendor is aggressively targeting expansion into the North American market, the majority of its current installed base is located in Europe, and there is limited brand awareness outside that region. Some EfficientIP customers have cited a need for improved postsales support, particularly around documentation.

Use Case: Enterprises in Europe or the U.S. should consider EfficientIP, particularly if lightweight NAC or NCCM is a priority. Organizations outside these regions should determine whether EfficientIP can provide appropriate local support.

Infoblox

Website: www.infoblox.com

Founded: 1999

Infoblox (BLOX) is a publicly traded company based in California and is focused primarily on DDI, with over \$225 million in revenue in FY13. The vendor targets midsize and large organizations with its Infoblox Grid architecture. DDI capability is delivered via hardware or virtual appliance (including support to run on Cisco Integrated Services Routers (ISR) and Riverbed Steelhead appliances). The solution supports both overlay and integrated deployment for DNS and DHCP services, including leading services from Microsoft, BIND, Unbound and F5's Global Traffic Manager.

Infoblox is the DDI market leader in terms of mainstream brand awareness and Gartner estimates that it represents 45% of the global DDI installed base. Mainstream Gartner clients often cite very good usability and strong support within Infoblox products. In addition, the vendor's partnership with VMware allows customers the option to manage Infoblox solutions via the VMware console. In addition to core DDI functionality, Infoblox provides solid NCCM capability via the NetMRI appliance-based product, acquired from Netcordia in 2010.

However, some Infoblox customers report frustration with Infoblox licensing costs and proposed migration plans (particularly when switching DDI vendors). In addition, Infoblox does not allow root-level access to its appliances, which a small percentage of DDI customers require.

Use Case: All organizations should consider Infoblox, unless root-level access is a requirement.

Men & Mice

Website: <https://www.menandmice.com/>

Founded: 1990

Men & Mice is a small privately held company based in Iceland. Its flagship product is a software-based DDI overlay solution that is designed to manage DNS and/or DHCP services from other vendors. In 2012, it introduced an integrated DNS/DHCP hardware appliance aimed at enterprises and a DNS caching appliance for the ISP market.

Men & Mice provides overlay support for DNS (BIND, Unbound and Microsoft) and DHCP (Microsoft, ISC and Cisco routers). The solution scales well and provides consistent administrative controls in

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heterogeneous environments. The vendor's customers cite simplified deployment as a key benefit to its solution, and the ability to integrate with Microsoft Active Directory eases some operational tasks, particularly site/subnet management.

Men & Mice is a small company with limited resources, and Gartner feels it will be challenging to serve two diverse markets — enterprises and service providers. Its enterprise focus may suffer if it shifts resources to support its strategy of selling DNS caching appliances to ISPs. In addition, some customers have cited a need for improvement of the GUI.

Use Case: Enterprises that prefer an overlay DDI deployment with strong administrative controls should consider Men & Mice.

Microsoft

Website: www.microsoft.com

Founded: 1975

With over \$77 billion in revenue in FY13, Microsoft (MSFT) has long been at the periphery of the DDI market by bundling DNS and DHCP services within Windows 2000 Server. With the release of Windows Server 2012, Microsoft added an IPAM application to its DNS and DHCP services. The vendor's DDI services are provided at no additional cost, and now include support for delegated DNS administration, DHCP failover and DNSSEC, and are tightly integrated into Microsoft System Center Virtual Machine Manager (VMM).

Given the zero-cost price, it is not surprising that Microsoft lacks a key feature in its DDI solution. Currently, the vendor does not provide native support for non-Microsoft DNS/DHCP services, which is an important requirement in most large enterprises. In addition, it does not offer native overlay management of non-Microsoft components (for example, BIND or DHCP on Cisco routers).

Use Case: SMBs using only Microsoft DNS/DHCP services should strongly consider Microsoft for DDI, especially since it is bundled (free of charge) with Windows Server 2012 R2. Larger enterprises with an all-Microsoft DNS/DHCP infrastructure should also consider the vendor.

Nixu Software

Website: <http://www.nixusoftware.com/>

Founded: 1988

Nixu Software is based in Finland and is a subsidiary of Nixu Group, an IT security consultancy. Since we last published the DDI MarketScope in 2012, the vendor has shifted its strategic focus away from the SMB market and toward the large enterprise market. It is also targeting cloud services providers and managed service providers with its IPAM solution, to enable self-service and automated private cloud capabilities for their customers.

Nixu's DDI components are available only as software appliances, which can be run on the leading hypervisors. NameSurfer, which includes DNS management and IPAM functionality, supports a broad multivendor environment. In addition to Nixu's DNS/DHCP servers, it also supports Microsoft DNS/DHCP, BIND, Unbound, Secure64 DNS, select Nominum products and the open-source Name Server Daemon. Nixu customers highlight ease of use as a strength for Nixu's solutions.

Nixu has not established a strong direct sales or VAR channel, and name recognition and branding are weak in the enterprise.

Use Case: Organizations that act as cloud services providers or management service providers should consider Nixu for its ability to enable self-service portals and automated virtualization functionality. Potential customers should verify that the vendor can provide adequate support outside of Nordic and Scandinavian regions.

IPAM-Only Solutions

Some organizations desire only IPAM, without the requirement for DNS and DHCP management and/or integration. All the vendors listed in this research support this IPAM-only use case. However, there are several additional commercial and open-source alternatives that provide IPAM-only functionality, including SolarWinds, ManageEngine, Apteriks and phpIPAM. These vendors and products are not included in the representative vendor list because they do not provide integrated DNS and DHCP services.

Market Recommendations

Organizations will benefit from investment in DDI if there are 10,000-plus IP addresses in use, or if DNS/DHCP instability or inadequate IPAM are pain points. DDI will also provide significant operational benefits for organizations that are deploying internally managed IoT initiatives, private clouds with automated DNS or widespread IPv6. In addition, there are now cost-effective DDI options on the market that serve smaller-scale I&O environments. When looking to invest in DDI, organizations should include deployment/migration strategy and costs as key criteria in the evaluation, due to the criticality and stickiness of DDI solutions. Organizations should plan on a five- to 10-year time horizon when making an investment and competitively bid solutions to keep pricing down.