

INFOBLOX STRATEGIC MARKET OPPORTUNITY

NIC INTERNAL WHITE PAPER

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graphics version

Executive Summary

This paper evaluates the causes and effects of widespread network trends driving unprecedented network growth and rapid network change. Increased provisioning episodes are directly proportional with increased financial risks due to inherent down-time risks. Infoblox introduces a strategic, novel plan, designed to address high risk factors and also integrates easily with those networks burdened by rapid updates.

Overview

Under these new requirements of scale, the natural tension between enabling network change and ensuring network reliability is reaching a breaking point. The time and place of the tipping point may take many organizations by surprise—new solutions are required to mitigate the shifting business model effects.^{i,ii} Infoblox can take advantage of this strategic market opportunity by expanding its current network services appliances into a real-time network configuration change solution called Infoblox Network Infrastructure Control (NIC).

NIC focuses on the emerging problems in virtual networking and cloud. NIC is a suite of products and uses real time distributed database technology. The NIC application suite is part of the next version of intelligent Grid™ and can be delivered on an appliance or virtually through software. NIC provides continuity and cost control by integrating into the current network. Implementing NIC in legacy IT infrastructures keeps the current network investment current and fully utilized. A key assurance in our customer support has been always fitting with a diversity of vendors. NIC will continue to adhere to that Infoblox ideology.

NIC is a strategic, scalable solution that tracks and securely manages the network infrastructure for this new market. Infoblox is known for focusing on heterogeneous and multi-vendor solutions and needs to keep this strategy to maintain market expectations.ⁱⁱⁱ

Critical Business Trends Affecting Development Trends

Network growth rate has always surprised people. Being able to identify an under-optimized trend is an opportunity for a strategic business move.

Growth of the Internet 1969 - 1997

In 24 years, TCP/IP networks grew from four hosting computers dedicated to research into 2.1 million nodes encompassing every networkable device you can imagine. No one saw this coming.

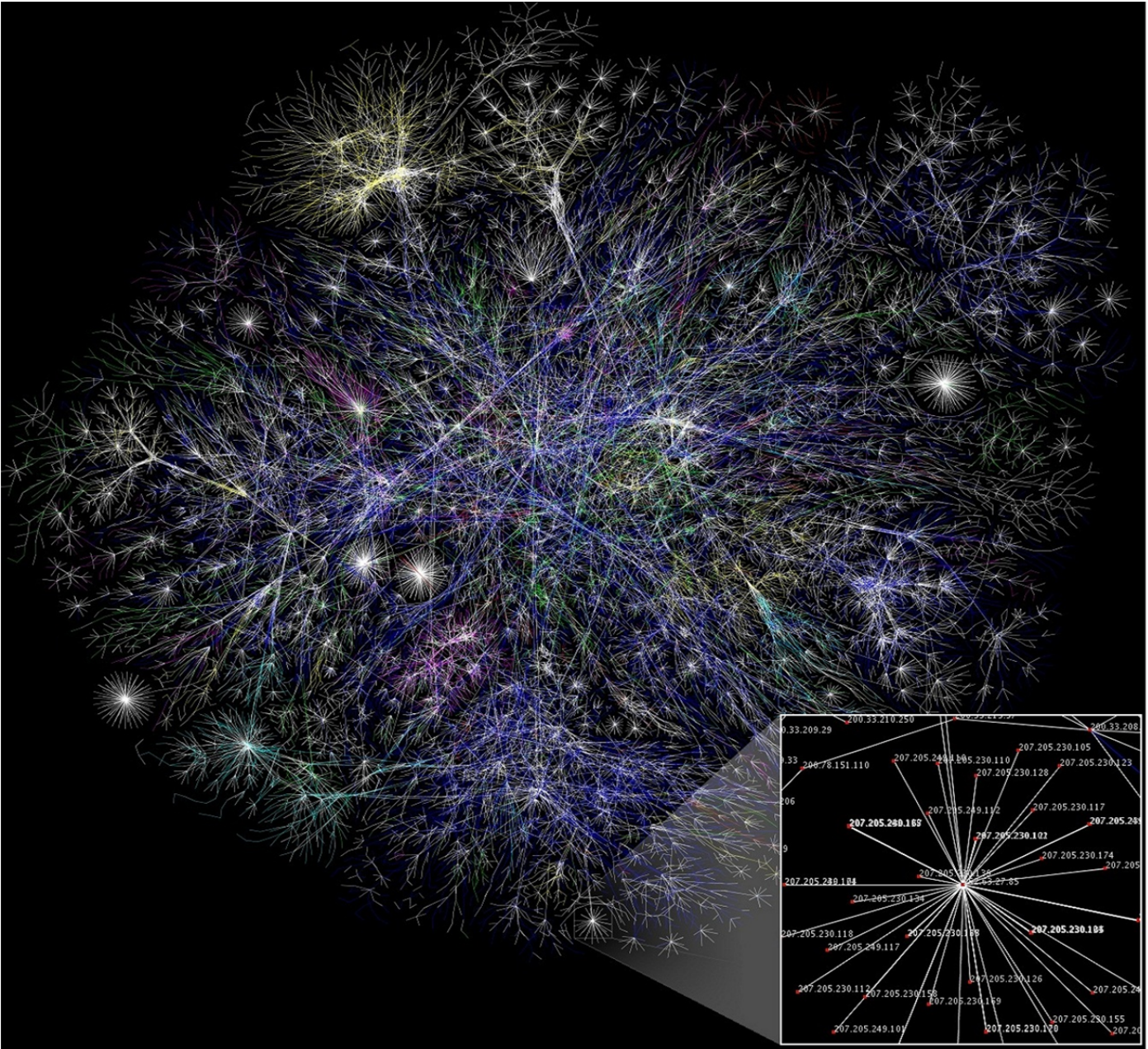
In 1999, Scientific America published, what was then, a shocking predication that by 2005, the Internet would be larger than the traditional telephone network -- hind sight is 20/20. Even as recent as this year, Tech World published IPv4 address depletion is predicted to be as early as December, 2010.^{iv} Even though the fact that we are running out of IP addresses has been public for years, 99% of internet-enabled hosts, world-wide are not incorporating this knowledge into their business models^v.

This paper focuses on foresight, so the business opportunity for NIC does not fall prey to other sharp-eyed vendors and leave Infoblox in the company of the “not incorporating” percentage ranks.

Growth of Very Large Networks

Today we have over 600 million servers on the public Internet, almost 2 billion users, and the Internet encompasses more than 10,000 networks.¹ Figure 2 shows a portion of the class C network addresses, representing very large public networks. This is an impressive image to see, for its size and complexity. The multifarious image of all private networks combined, estimated to be at *least* one order of magnitude larger than the public network, is not feasible for this paper. It's much too complex and massive to present visually. Imagine each node show in Figure 2, as the starting point of a private intranet, with dozens to thousands of end-points. The enterprise market is still growing^{vi} and that makes the enterprise market a target for cost effective solutions to emerging problems in the market.^{vii, viii, ix}

¹ Historical data gathered from betterwhois.com, PBS (1998) History of the Internet, and 2009 Vinton Cerf lectures



Each node represents an IP address. Each line between the IP addresses represents a traffic connection between the nodes. The lengths of the lines indicate the delay between those two nodes. This graph represents less than 30% of the Class C networks reachable by the data collection program in early 2005. Lines are color-coded according to their corresponding RFC 1918 allocation as follows:
Blue: net, ca, us **Green: com, org** **Red: mil, gov, edu** **Yellow: jp, cn, tw, au, de** **Magenta: uk, it, pl, fr** **Gold: br, kr, nl**
White: unknown

Figure 1 Partial map of the Class C networks Internet^x

Growth of the Internet Traffic

Figure 2 shows internet traffic grew exponentially over the last 20 years.^{xi} Enterprise network traffic, with a well-developed electronic communications infrastructure, are also growing at about an exponential rate.^{xii}

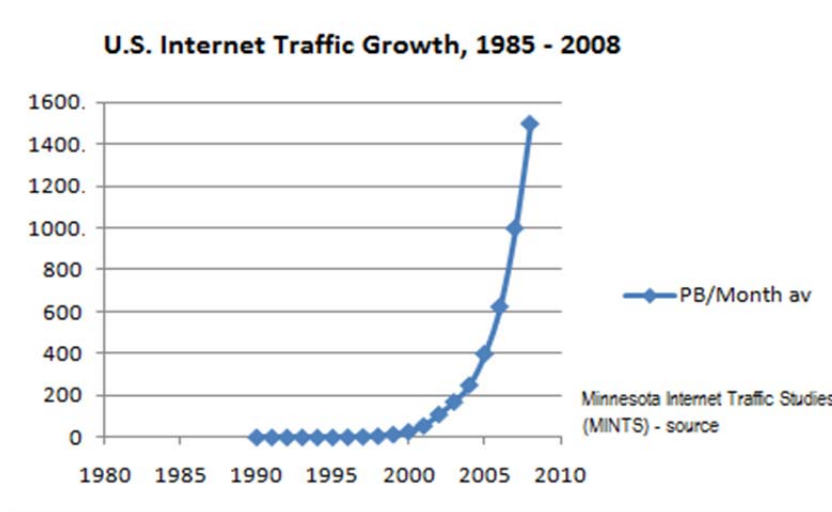


Figure 2: Internet traffic estimates 1985 to 2010

You can infer from Figure 2, that regardless of transmission technical advances, our exponentially growing world population^{xiv} is somehow coupled to the growing internet usage. At times during the internet growth, the demand causes network traffic bottlenecks. Eventually, a paradigm shift occurs; the Internet community embraces new technology and moves on with new developments at a faster rate of change, until the growth rate exceeds capacity again, and another shift occurs allowing traffic to speed up. Appreciating the exponential functions is important because time runs out in a hurry towards the end of any exponential growth system, forcing hurried decisions and limited options.^{xv}

Components of Change in the Market

There are three components of change driving market growth and business decisions:

- Increasing rate of configuration
- (Virtual) network size
- Amount of mission critical network traffic

The concern is not so much that networks are growing fast and the rate of growth is also increasing, it is that today we are moving massive amounts of data and that data on-line increases business risks and cost. A great cause of concern is the changing networks themselves – this change is driven by an explosion of devices and form factors, virtualization and cloud computing. We propose NIC addresses the networks affected by this growth phenomenon. See Figure 3 for market segments relative to rate of configuration change.

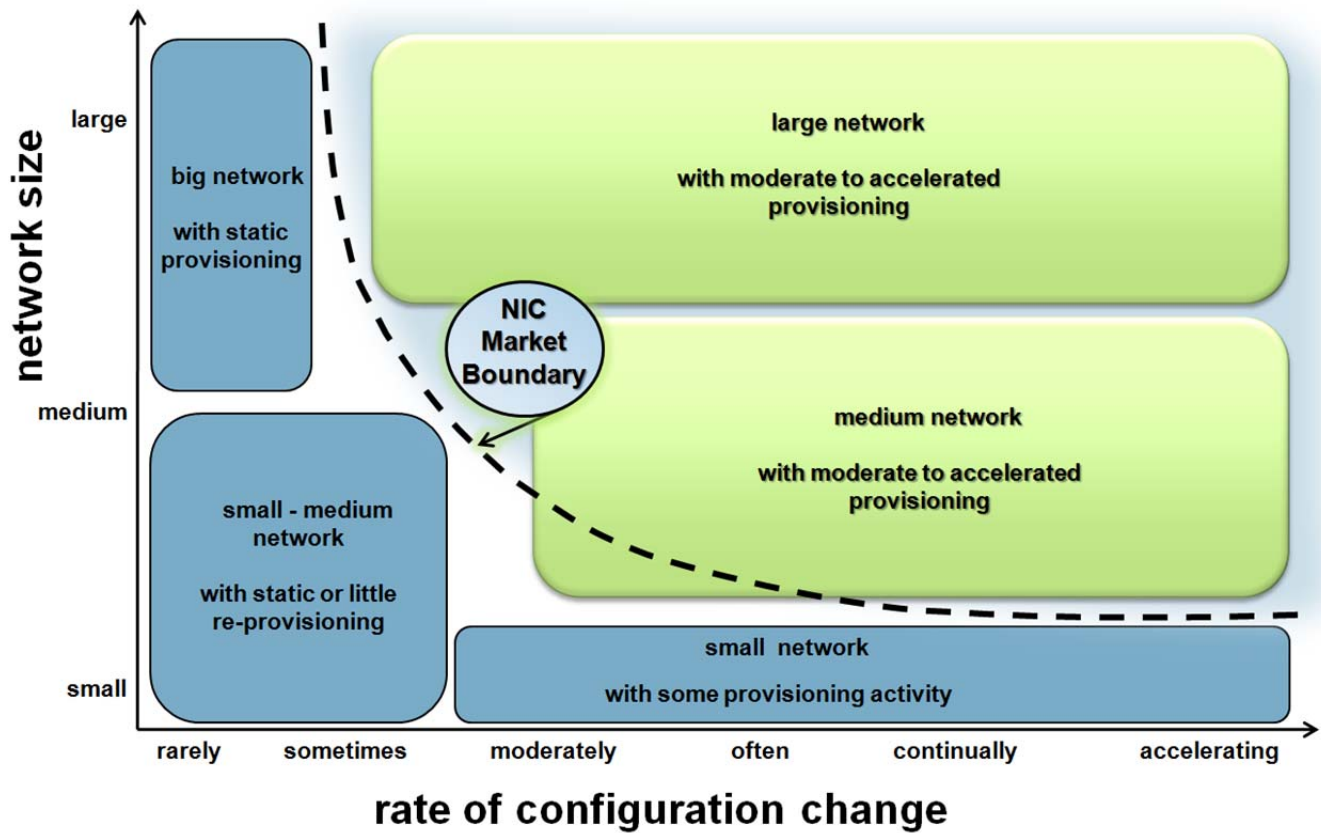


Figure 3: NIC market defined by rate of configuration change in all network sizes

Changes in networks, up until Infoblox solutions, were all done manually. Today, network downtime, with petabytes of data online, is an enormously costly risk factor. This is one of the top potential network management problems to minimize. Even small networks have to change a lot. Our way of life today is all about gaining more mobility, more data, and more massive data transfers, all the while being mobile. As a result, if networks are not managed carefully there is a much higher risk of downtime. As a result, if networks are not managed carefully there is a much higher risk of downtime.

Datacenter Virtualization

Data center virtualization makes computing resources more flexible and efficient. At the same time, this also reduces costs and accelerates IT processes. Yet, the automation eventually runs into troubling networking issues when a critical mass of high-speed bandwidth servers is reached, due to multiple processes, multi-media content, and increased data. To capitalize on the benefits of virtualization, most datacenters make fundamental changes. “The physical network must adapt to the requirements and advantages created by virtualization, specifically higher utilization and higher bandwidth. To do this, forward-thinking network professionals have implemented the End-of-Row or Top-of-Rack topologies in their datacenter networks.”^{xvi} A virtualization strategy is more likely to succeed if the datacenter network is also flexible and dynamic.

Cloud Computing

Virtual network are the underlying technology in cloud infrastructures.^{xvii} Cloud computing shifts functionality from desktop motherboards to Internet-based computing service networks. It encompasses Software-as-a-Service applications, such as Salesforce.com™, as well as online storage and operating systems platforms, such as Amazon™.

Gartner proclaimed public and private cloud computing heralds an evolution of business that is no less influential than was e-business. “During the past 15 years, a continuing trend toward IT industrialization has grown in popularity as IT

services delivered via hardware, software and people are becoming repeatable and usable by a wide range of customers and service providers,” said Daryl Plummer, managing vice president and Gartner Fellow.^{xviii}

Infoblox Market Position

Gartner puts Infoblox as a market leader in real-time network information services (see Figure 4). Infoblox has over sold over 40,000 appliances to more than 4,100 clients across all vertical markets of which 200+ are in the top Fortune 500. Generally speaking, anywhere Cisco Systems® can sell a router or a switch, Infoblox can sell Infoblox gear. The market differentiator of Infoblox is a core competency of real-time distributed information management.

DNS, DHCP, IP Address Management (DDI)

	RATING				
	Strong Negative	Caution	Promising	Positive	Strong Positive
Alcatel-Lucent			X		
Blue Cat				X	
BT Diamond				X	
Efficient IP		X			
Infoblox					X
Men & Mice		X			

Source: Gartner DDI Market Scope (November 2009)

Figure 4: A Gartner market comparison chart showing Infoblox as a clear DDI market leader, with Infoblox network service platform

Now, more than ever, the mission-critical nature of DNS and DHCP services remains prominent due to network scalability and reliability demands. Downtimes and latency issues, such as secondary DNS resolution or DHCP latency, are incompatible with networks requiring high availability solutions. In 2009, Gartner named Infoblox as the market leader due to Infoblox’s pioneering integrated DDI appliances. With the purchase of NetMRI, Infoblox became a challenger in the network configuration and change management (NCCM) market.

Network Configuration Change Management (NCCM)

	RATING				
	Strong Negative	Caution	Promising	Positive	Strong Positive
AlterPoint			x		
BMC Software				x	
Cisco		x			
Dorado Software			x		
EMC					x
HP					x
Intelliden, an IBM company				x	
LogLogic			x		
ManageEngine			x		
Infoblox (formerly Netcordia)				x	
Pari Networks		x			
SolarWinds				x	
Uplogix		x			

As of 29 March 2010

Source: Gartner (March 2010)

Figure 5: A Gartner market comparison chart showing Infoblox as a strong contender in the NCCM market, with NetMRI

The commercial DDI market is expected to increase due to large scale adoption of DNS Security Extensions (DNSSEC) by multiple government mandates and major domain name registries. By extrapolation, in 2014, 30% of all DNS lookups will be signed with DNSSEC. As more enterprises sign their zones, they will move away from BIND and adopt commercial DNS solutions that offer tools that ease the key management and zone signing processes.^{xix}

Increased network complexity from virtualized and cloud computing environments will force network managers to embrace more automation, which should put the Infoblox NIC solution in a strong market position.^{xix}

NIC Framework

What makes real-time, virtualized database relevant for Infoblox is that the Grid can distribute instances of virtual switches during provisioning and configuration since, in the end, they are just files. Network management configuration changes are made at machine speeds – it is no longer an overlay. By using Grid technology, NIC delivers real-time network services that can never fail.

In order to create an end-to-end connectivity for the new application, these tasks need to be done in an end-to-end way across multiple physical network devices. Network config tools today, such as NetMRI, can help execute the steps in isolation. What is needed is a meaningful way to orchestrate that process across a complex network topology for an end-to-end solution.

The head-end from VMware is vSphere which interfaces with Infoblox Grid Master. ESX (a block of servers) is the v-machine layer on potentially hundreds of big servers. On top of that is any number of virtual machines. NIOS is the network infrastructure operating system. On top of NIOS are DNS and DHCP, virtual services, network configuration change management, and possibly load balancing, WAN optimization, and firewall security. When using NIC, you can define the management plane so that even thousands of components are automatically configured in the Virtual Network control plane (see Figure 6).

The NIC management solution couples the virtual network control plane and the virtual network management plane. NIC users can define high-level abstraction management, automatically configure at the control plane level and have rapidly re-provision end-points.

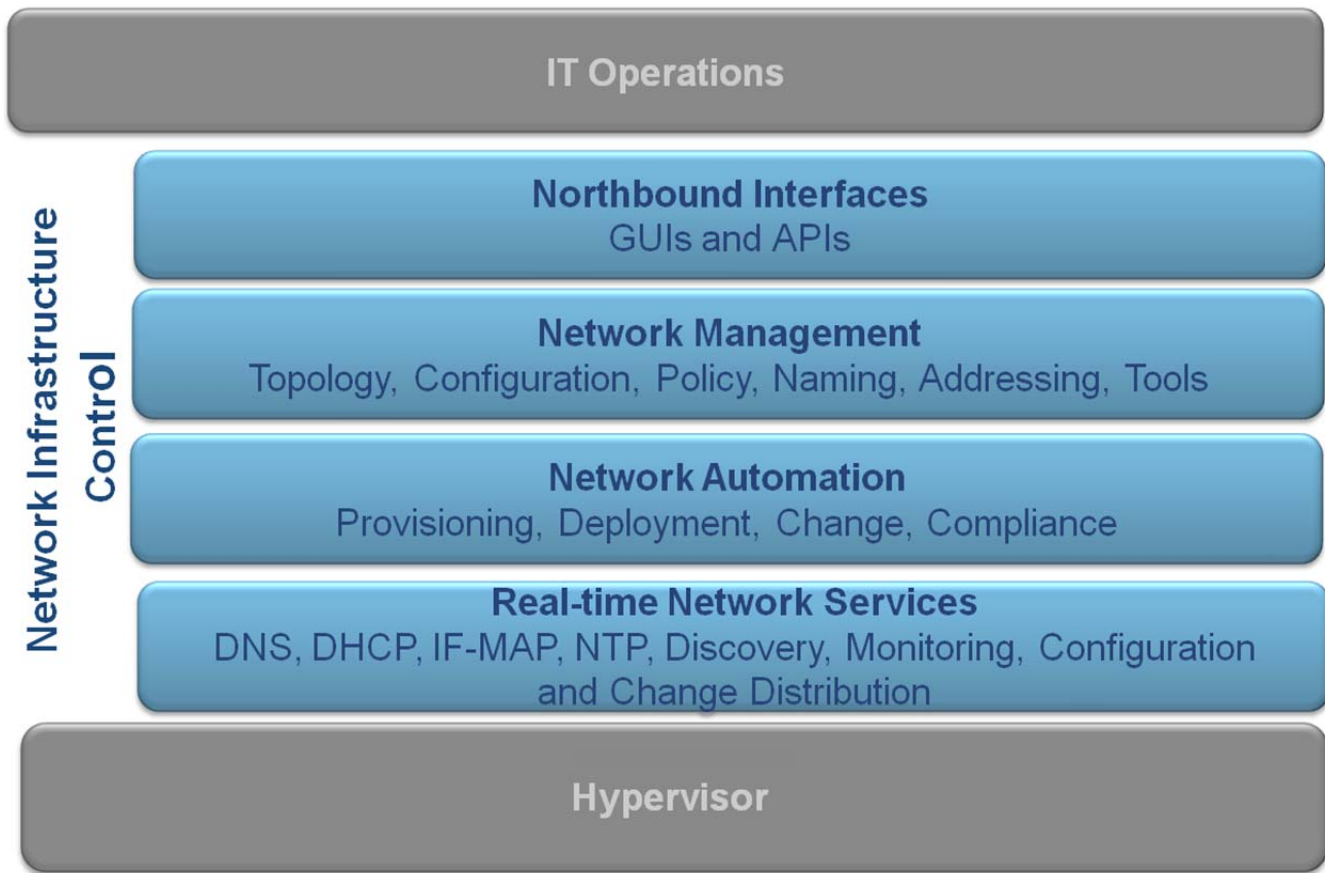


Figure 6: NIC in the virtual network

Summary

Today’s networks grow due to mergers, on-line business applications, mobile devices, and stationary office machines. Company employees anywhere in the world regularly telecommute and join in live voice and video conference meetings. The bottom line is that efficient networks mean additional revenue.

There are three imminent network issues:

- The fast increasing rate of provisioning and de-provisioning
- The tremendous growth of the internet and intranets
- The exponential growth curve of data transmission

Solutions can be developed to address these changes, but they are going to involve a dramatic leap, both in thought and in action, beyond our current methods. Key decision makers must recognize changes in their environment. They must choose to adjust their focus and corporate movements to keep current with market shifts to stay viable in the market.ⁱⁱ

This paper proposes to address these critical issues is to have real-time capabilities by designing and implementing a real-time database for network infrastructure data information. The company to develop a cost effective solution such as this, is a company with real-time data management experience. That company is the number one Gartner-rated company, Infoblox.ⁱⁱⁱ Infoblox NIC solution begins with intelligent Grid and NCCM.

See also: "NIC Internal Reference Paper"

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^{iv} Carolyn Duffy (2010), TechWorld, "Last IPv4 Addresses Could Run Out by December"

^v S.H. Gunderson, et al.,(2008), Google, "Global IPv6 Statistics - Measuring the current state of IPv6 for ordinary users"

^{vi} Trefis.com (2009), "Growing Enterprise Router Market Yields Small Upside for Cisco"

^{vii} Valerie Valentine (2010), information-management.com, "SaaS Keeps Growing in the Enterprise Application Market"

^{viii} Kenneth Corbin (2010), CIOupdate.com, "Security Software Market Still Flying High"

^{ix} Matt Hamblen, (2010), Computer World, "Carrier Ethernet market still growing, study shows: Video traffic is a big driver"

^x based on the January 15, 2005 data found on opte.org

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Available at <http://www.research.att.com/~amo/doc/complete.html>

^{xii} (2009) Minnesota Internet Traffic Studies (MINTS), University of Minnesota

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Available at <http://www.research.att.com/~amo>

^{xiv} United Nations Department of Economic and Social Affairs' Population Division, 2004, "World Population To 2300"

^{xv} Albert Bartlett (multiple references) University of Colorado, Boulder

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^{xix} Debra Curtis, et al., (2010), Gartner, "Infoblox Expands Network Automation With Netcordia Buy"