Altiris as an Implementation of Dell’s Scalable Enterprise Reference Architecture

A White Paper Jointly Authored by Altiris Product Strategy and Dell’s Office of the CTO

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Altiris Inc. is a pioneer of IT lifecycle management software that allows IT organizations to easily manage desktops, notebooks, thin clients, handhelds, industry-standard servers, and heterogeneous software including Windows, Linux, and UNIX. Altiris automates and simplifies IT projects throughout the life of an asset to reduce the cost and complexity of management. Altiris client and mobile, server, and asset, network, and security management solutions natively integrate via a common Web-based console and repository. For more information, visit www.altiris.com.

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This white paper is jointly authored by Altiris Product Strategy and Dell's Office of the CTO in an effort to demonstrate alignment between Dell's Scaleable Enterprise vision and Altiris architecture. Dell's position as a major hardware vendor dramatically influences manageability standards and hardware design while Altiris’ position as a leading ISV directly addresses lowering overall Dell hardware total cost of ownership (TCO) as part of a larger automated, remote management framework.

Dell and Altiris first formed a strategic relationship in 2002 to provide optimized client system lifecycle management for Dell customers with the launch of OpenManage™ Client Administrator (OMCA). OMCA is built on the Altiris Infrastructure and has an expanded set of hardware capabilities designed to help our customers reduce the cost of owning and managing Dell client systems. We extended our collaboration to server management in 2004 through 2005 with the introduction of Altiris® Server Management Suite™ for Dell Servers and its associated Dell specific components. We continue to collaborate closely, as partners and mutual customers, on products that deliver value today and standards that preserve alignment with long-term considerations. Our common goal is to help simplify IT management.

As the market moves toward ever-increasing levels of data center automation, customers are faced with the challenge of evaluating the maturity and “fit” of evolving management solutions. In an effort to provide some guidance for these customers, Dell has developed its Scalable Enterprise Reference Architecture (hereafter referred to as the Dell architecture). This model describes the components, workflow, and capabilities that Dell recommends as key considerations for those customers striving to balance short-term management needs with long-term business goals.

This white paper validates the Altiris solution as an implementation of Dell’s reference architecture and explains how Altiris is aligned with what Dell foresees.
This section briefly reviews the key components and concepts of Dell’s reference architecture so that later comparisons to the Altiris solution set are more readily understood.

**Architecture Drivers**

The four key drivers of the Dell architecture align closely with the Altiris model. These are:

- Standardization
- Flexibility
- Interoperability
- Scalability

**Standardization**

This is the primary driver in Dell’s vision of data center evolution. Dell defines standardization to include both de facto and engineering standards, but tends to place greater emphasis on de facto standards; that is, those technologies proven effective by market adoption.

In addition, Dell defines “standardized” servers to be ia-32/x-86 instruction set machines with one to four CPU sockets.

The Altiris service-oriented architecture (SOA) is similarly rooted in standards, both engineering and de facto. Altiris incorporates HTTP/S and XML as the primary transport mechanism for client/server and inter-server communication. Altiris also offers Altiris® Connector Solution™, which provides a two-way data exchange with the Altiris Database and third-party systems via common data formats.

Altiris also recognizes the usability gains and lower TCO benefits of de facto standards such as Microsoft’s .NET Framework technologies as implemented by backend server components and the Altiris Web-based user interface. Additionally, Altiris utilizes Microsoft SQL 2000 as its database format and leverages Windows-based authentication along with an NTFS-like permissions hierarchy in its role-and-scope-based security model.

Altiris uses other standards, including DCOM and SOAP, and is a member of the Distributed Management Task Force (DMTF). DMTF standards provide common management infrastructure components for instrumentation, control, and communication in a platform-independent and technology neutral way.

Altiris provides a leading heterogeneous management platform, which its customers value because it allows them to centrally manage environments of mixed hardware, operating systems, and devices from the consolidated Altiris Console. And while Altiris offers support for
Windows, Linux and UNIX data center environments, Altiris recognizes the dominance of the x86 servers and therefore dedicates a majority of development resources and roadmap focus to this market segment.

The Dell architecture proposes that standards-based solutions are largely “future proofed” because they offer the highest and most enduring degree of flexibility, interoperability, and scalability—the other key drivers in Dell’s model.

**Flexibility**

Dell suggests a management model comprised of basic building blocks that can work autonomously or snap together for an integrated end-to-end configuration. Flexibility also requires adaptability to new standards and technologies as they emerge over time. Dell’s model is extremely pragmatic in that it readily identifies data center management as a rapidly maturing market. While significant automation opportunities exist today, Dell recognizes that the market is rapidly evolving to address existing gaps.

Similarly, Altiris solutions are delivered as individual building blocks that can function independently or as a part of a larger Altiris framework where data and functions are leveraged across solution modules. Altiris solutions can be purchased as standalone tools or deployed as integrated suites to address comprehensive IT processes and workflows.

The Altiris SOA allows all Altiris solutions to utilize a common backend that manages and optimizes client/server communication, agent management, data processing, policy execution, role-and-scope-based security, database connectivity, and third-party integration. The flexibility of starting with a single solution with the option to move to a seamless, integrated platform in the future is a compelling Altiris value proposition. Because individual solutions map to the larger Altiris framework, customers who purchase an individual Altiris solution targeted at solving immediate problems are also building a foundation for the future. The customer has the option of adopting the larger solution set as needs, infrastructure, and budgets evolve.

Altiris’ flexibility as a solution is further realized in the Altiris Console design philosophy. For example, every page (report, policy, and view) in the Web-based Altiris Console is directly URL-addressable. Customers can easily build custom Web-based views that include just those tasks or reports that are meaningful to them for quick access from a customer intranet set or a list of browser favorites. Altiris’ role-and-scope-based security continues to govern access to each page, even if it is accessed directly by a URL. This design feature provides the ability to mix and match presentation layer access with far greater flexibility than competing technologies such as a MMC or standalone Win32 console.
The use of aforementioned technologies such as XML, SQL, and SOAP increase the flexibility of Altiris solutions.

**Interoperability**

Dell defines any model that is standardized as “open.” This assures customer choice across all aspects of data center management.

Similarly, Altiris realizes that customers will often need to integrate the Altiris Console and data with third-party systems. To facilitate this integration, Altiris offers multiple connectors that provide needed integration out-of-the-box. For example, customers may choose to maintain a Remedy help desk instead of using Altiris® Helpdesk Solution™, or they may choose to integrate with HP OpenView instead of using Altiris® Monitor Solution™. In these cases, Altiris connectors can provide user interface and data integration across multi-vendor environments.

For those cases where Altiris does not offer a pre-built connector, Altiris Connector Solution allows customers to build their own policies for exporting any Altiris data classes to and from the system either scheduled or on-demand using one of several standard formats, including XML, CSV, and ODBC.

Whenever possible, Altiris avoids a proprietary and/or agent-based implementation. For example, Altiris personality packages that contain custom user data and settings are stored as self-extracting executables with a rich command-line interface. These packages can be applied entirely outside the Altiris management infrastructure if need be. They can be delivered and scripted by a variety of Altiris or non-Altiris tools. Furthermore, Altiris software delivery packages do not utilize any kind of proprietary wrapper. Instead, Altiris leverages its award-winning Wise software packaging technologies to create standard *.msi packages and leverage the many advanced installation and self-healing characteristics of this package format.

As another example, Altiris® Deployment Solution™ provides extensive bare-metal server provisioning features and includes as part of its workflow the ability to insert any “Run Script” task as part of an Altiris job. Customers can use these tasks to insert any DOS command language (batch file), VBscript, or Linux shell at any point in a customer-defined workflow. This capability allows users to wire together Altiris and non-Altiris management functions into a comprehensive solution designed to offer customers the ultimate in flexibility and ease-of-use.

**Scalability**

Dell’s architecture insists that solutions not only be able to scale as infrastructure expands, but that they deliver at the point of customer need—without pushing beyond it or falling short. To demonstrate this
concept, Dell proposes “Five Degrees of Automation” and suggests that not every customer will benefit from the highest level of automation. Solutions must be capable of delivering subsets of automation across solution sets, perhaps in combination with more manual controls, tailored to precise customer needs. This functionality allows customers to take delivery of needed management functions as they grow and in exact proportion to needs without enormous initial investments in management software.

As previously discussed, Altiris solutions support this model. Customers can purchase the one or two solutions they need today while maintaining the option to add more solutions in the future. With each additional Altiris solution installed, the customer realizes new functionality as solutions extend across each other to expose new levels of manageability. For example, when both Altiris® Inventory Solution® and Altiris® Application Metering Solution™ are installed, additional data correlations can be viewed that are not possible with either product independently. These reports can quickly and easily provide administrators with “installed vs. used” data. Altiris can identify what software is installed via Altiris Inventory Solution and what software is actually being used via Altiris Application Metering Solution. With both solutions installed, the Altiris Console can correlate the data from each solution in a new series of reports that extend the value of the system beyond that of its individual solutions.

The common Altiris data model does not limit this concept just to reports but supports it across collections, policies, notification alerts, etc. Customers can create their own increasingly customized and automated scenarios by pulling from data sets that simultaneously span many different Altiris modules.

**Dell’s Five Degrees of Automation**

As a corollary to its primary architecture drivers, Dell’s Five Degrees of Automation suggest a maturing evolution toward data center management. In some cases, a higher order degree may be dependent on a lower order degree, but not necessarily. Barriers remain in the market that challenge management providers in delivering on the higher automation degrees Dell identifies. Foremost among these is the lack of standards and/or standards implementation. Figure 2 shows the five levels with a brief description of each.
Degree 1: Solution-based Automation

Examples of solution-based automation include Oracle, SAP, and Microsoft Exchange. At present, these applications do not adhere to a common interface that allows external processes to manage them with similar calls and functions. These applications are highly unique and require application-specific knowledge and tools to automate their configuration.

Custom scripts can be created and called from external processes, but no common object model can be leveraged across all of them until new standards are created and then implemented by the various vendors. Any prepackaged automation remains application-specific and requires unique maintenance and configuration.

Degree 2: Resource Cooperation

Automated common infrastructure supports cooperation between groups of discrete solutions. Server virtualization can help enhance equipment utilization, and a reduction in the number of physical servers can reduce operational costs and staffing. A common infrastructure provides the means to automatically manage systems and operations at a common resource level.

Degree 3: Dynamic Automation

Dynamic automation begins to enable end-to-end, service-oriented automation by establishing enterprise management and orchestration among groups. Specifically, this degree introduces tools that allow the data center to automatically allocate or reallocate resources based on a set of operational criteria defined by service needs.
Degree 4: Business Policy Computing

Business-based computing represents a model in which business goals and motivations become the key IT driver. This degree represents a highly flexible, standardized infrastructure in which technical services become the commodity.

Degree 5: Virtual Data Center

The connection between an application and the underlying physical assets on which it is executed will have little relevance. The goal of the virtual data center is to automate every aspect of an organization’s business operations and enable such operations to be configured or reconfigured as needed to achieve maximum business effectiveness. Much of the actual construction and operation of a fifth-stage virtual data center remains to be determined.

Scalable Enterprise Resource Directory (SERD)

Dell anticipates growth in the formulation of its Scalable Enterprise Resource Directory or SERD, which Dell sees as the natural evolution of the Change Management Database (CMDB) and a precursor to data center automation ideals. The fundamental value of the SERD is interface standardization.
Today, APIs are the fundamental interface to drive system integration. APIs between vendors can implement different object models and require extensive education and development efforts to leverage. Because each vendor considers their offering to be the source of truth, APIs exist to bridge these sources without appealing significantly to the need for a recognized, centralized source of truth that vendors take direction from.

The SERD is essentially a standardized catalog of data—a common object set based on XML and CIM standards. The value of the SERD data model is that it serves as the source of truth and fundamental interface for integration and management tasks. As objects are created and relationships are defined in the SERD, all downstream layers in the model adjust to physically instantiate what exists in the directory. All management systems look to the central SERD as the source of truth and actuate what exists there (or notify administrators of existing gaps).

The SMASH standard is simply an intermediate step toward the SERD. First vendors will align programmatic interfaces (SMASH) with the eventual realization that a common data model (the SERD) is the ideal, unifying approach.

**Summarizing Dell’s Components**

The next chapter discusses how the Altiris SOA maps into the Dell architecture. However, it is important to briefly review the key components of the Dell model:

- Orchestration
- Monitoring
- Element management
- Mapping and control (MAP)
- Resource managers
- Support system
- Application and OS

**Orchestration Components**

This component layer understands what relationships should exist in SERD and initiates actions to instantiate those relationships. Orchestration bridges monitoring data with operational processes. Today, custom scripts serve much of this function. However, though they address the problem, they are not flexible and can be difficult to precisely define.
**Monitoring Components**

Dell suggests monitoring components perform two primary functions:

- Targeting non-compliant behavior in the system; operations align with policies (can be agent or agentless). Exception processing begins here and is passed to the orchestration layer and resource manager for resolution.

- Implementing relationship modifications as directed by the orchestration layer and reconciling them with SERD. Ensures that what is in SERD is congruent with what orchestration requested. Any differences in comparing actual with expected notes is an exception.

**Element Management Components**

Dell defines element management as the layer of intelligence that operates specific standard platform types (server, storage and fabric). Ideally, Dell encourages standardization of configuration interfaces via such initiatives as SWMG’s SMASH proposal. For the time being, however, Dell recognizes that more proprietary interface implementations are required. This elemental layer includes such tools as Dell’s OpenManage Server Administrator (OMSA) for server management or Dell’s OpenManage Switch Administrator for network fabric management.

**Mapping and Control (MAP) Components**

MAP components manage the current relationships of all components in the Dell architecture; that is, the "as is" state of each relationship. This layer is tightly associated with physical data center operations and contains three primary functions:

*Operational management*

This component directly interfaces to each element component and is responsible for groupings, bindings, and provisioning. Operational management translates global operational directives into operational directives.

*Provisioning*

This component allows for a flexible, efficient, and extensible server management environment. For example, bare metal to OS to application provisioning, be they physical or virtual machines.
Virtualization

VLANs and SANs are popular examples in today’s data centers; all state information is abstracted from the physical resource.

- Virtualization layer placed between hardware and OS (GSX or virtual server)
- Virtualization embedded into the host OS (ESX)

Resource Manager Components

Resource manager components interpret how to operate and utilize a specific type of managed resource (server, storage, and fabric).

Support System Components

Support system components are self-contained entities that help orchestration and resource managers control system-wide behavior. For example, an isolated function leveraged by a higher order component in the model.

Application and OS Components

Dell proposes that as the data center evolves, applications and operating systems will become increasingly intertwined. For example, in a VMware ESX server, the host OS aligns with the hardware while the guest operating systems are tuned more for the applications they support.
Now that we’ve reviewed key aspects of Dell’s reference model, we can begin to map Altiris conventions into it. This chapter provides an overview of the Altiris SOA and begins to position it as an implementation of Dell’s vision.

The Altiris SOA is fundamentally a management environment that provides a common set of services to all Altiris solutions, including processes such as:

- Client/server communications
- Data modeling and processing
- Web publishing
- Security
- Repository structure and maintenance

These shared components provide a number of advantages to both the customer and Altiris:

- Any updates to these core components benefit virtually all of the Altiris products, improving the efficiency of Altiris solutions’ development teams by allowing them to focus on solving customer pain points.
- Solutions developed on the Altiris SOA automatically integrate with other supported solutions.
- Customers buy only what is needed today with the confidence that management capabilities can easily be expanded as their company grows and business needs change. Altiris solutions are effectively “future-proofed” in this way.
- Due to a common architecture, Altiris products speed ROI and maximize TCO reduction in many ways, including the ability to target management functions when and how they are needed using a single, leveraged infrastructure.

**Industry Standards**

The Altiris SOA is built on the .NET Framework and uses industry-standard technologies for storing, processing, and presenting data across distributed networks and the Internet. For example, by leveraging the HTTP/S protocol for client/server/console communications, Altiris ensures efficient, secure transmission of data across network segments or through the firewall.

The Altiris SOA also supports XML and SQL, which ensures that the Altiris Database is consistent and extensible, making it easy to associate and correlate data between Altiris solutions or third-party management
tools. Other industry standards and initiatives leveraged in the Altiris SOA include:

- WBEM (Web-Based Enterprise Management)
- CIM (Common Information Model)
- WMI (Windows Management Instrumentation)
- DMI (Desktop Management Interface)
- SMBIOS (System Management BIOS)
- SNMP (Simple Network Management Protocol)
- WSDL (Web Services Descriptive Language)
- LDAP (Lightweight Directory Access Protocol)

Supporting these technologies enables Altiris to speed product development lifecycles, shorten product time to market, and better connect with customers.

**Plug-and-play Design**

Many vendors who claim to do lifecycle management are actually focused on one aspect of the IT lifecycle, such as software distribution, while providing a list of partners who offer tools for other phases of the lifecycle, leaving customers to the details, such as the implementation and integration of disparate technologies from multiple vendors. Conversely, the Altiris SOA allows additional solutions to be snapped in to extend functionality, simultaneously providing native integration and minimizing implementation efforts.

This plug-and-play design results in lower implementation and training costs, and because the new solutions operate efficiently on a shared platform, there is no need to dedicate resources to an integration project. In addition, a shared platform enables Altiris to provide a common security model, data model, agent management, and console integration that partnerships just cannot deliver.
Thanks to this flexible design, the Altiris SOA allows customers to buy only what they need today, but with the confidence that they can expand their management capabilities as their business grows and changes. This service-oriented architecture allows an Altiris solution to leverage any other Altiris solution’s data. This model allows Altiris to use policies to force actions. For example, BIOS revision data for a Dell server obtained by Altiris® Patch Management Solution™ for Dell servers can be used to define a collection for use by an Altiris® Application Management Solution™ policy. As more Altiris solutions are added to the framework, benefits of the integrated Altiris data model place more and more control in the hands of administrators to build policies that provide fine-grained targeting of management functions.

Cross-platform Support
The benefits of the Altiris SOA extend beyond the Windows platform. Because many Altiris customers manage a diverse environment that may include multiple hardware and OS platforms, Altiris is committed to
providing solutions for non-Windows systems. Specifically, Altiris has solutions for:

- UNIX
- Linux
- Macintosh
- Palm devices
- BlackBerry devices
- Network devices (for example, switches, routers, and printers)

This means that Altiris provides centralized control of all IT assets, consolidating an enterprise’s data to provide aggregate, cross-platform reporting from a single data repository. In addition, by managing these assets from within the Altiris SOA, total management costs will be reduced, because the customer doesn’t have to implement or maintain multiple management infrastructures. The customer can leverage existing hardware investments to provide secure, scalable management while minimizing training, support, and implementation costs.

**Figure 5**

*Altiris provides centralized control of all IT assets, consolidating an enterprise’s data to provide aggregate cross-platform reporting from a single data repository.*

**Customization**

IT operation’s core responsibility is to deliver services designed to increase operational efficiency and business agility. However, multiple layers of old and new technology, continuous business process
improvement, security threats, and pressure to comply with regulations have required IT operations organizations to become more agile in the delivery and management of IT services. What works for one organization may not necessarily work for another organization. Customized services that meet the specific needs of an organization help ensure increased IT infrastructure and application stability, which results in operational and business agility, helping IT operations successfully support business initiatives and reduce operational costs.

To develop, offer, and support IT services, IT organizations require complete visibility into and control over the IT infrastructure, resources, and support processes.

Altiris IT service management helps organizations manage IT infrastructure resources, create cost-effective service offerings, and manage towards defined service levels to support corporate business initiatives. Altiris IT service management solutions take the guesswork out of constructing attainable IT services based on industry standards and best practices such as ITIL and CobiT by building, maintaining, and evaluating the success of services supplied to the organization. The continuous management of the IT service lifecycle enables IT organizations to maximize their IT resources and ensure the highest service level while minimizing costs by leveraging an extensible architecture. This presents unprecedented integration of client and mobile, security and compliance, server and infrastructure, and service and asset management solutions.

In addition to solution integration, the Altiris SOA provides unmatched user customization options, thanks in part to the advancements of the .NET Framework in Web application development.

For example, the Altiris Console provides a Shortcuts tab, which allows customers to build their own unique console. This view allows customers to create links to their most frequently accessed pages in the console, creating a secure, customized view into their Altiris environment. For example, Altiris suites include hundreds of pre-built Web Reports™ out of the box. However, perhaps an administrator cares only about the status of software distribution tasks. Instead of having to access the Reports tab and drill through reports the administrator doesn’t care about each time to reach these status reports, he or she can create a shortcut to these reports in the Shortcuts tab. When the administrator selects the newly created shortcut, the page that the shortcut represents is loaded into the right-hand frame for seamless navigation. Administrators can create shortcuts for virtually any console page, including tasks, resources, and reports.

Does the customer have a support portal or help desk? What about a provider looking to provide tools for his or her customers? Altiris makes it easy for its customers and partners to access the Altiris Console from
other Web applications and pages and create their own look and feel. The .NET Framework has enabled Altiris to provide another technology innovation, which has been incorporated into the Altiris SOA, called GRAFT technology. Because each page in the Altiris Console is accessible via a unique URL, customers can create hyperlinks to these pages in other Web media to access the pages. The Altiris Console even supports its pages being loaded inside frames. Security is maintained for each page, and left-/right-click menu functionality is available, making each page self-contained and fully functional. Customers can create their own navigation menus, provide custom logos, and preserve their corporate look and feel.

Altiris is able to provide its customers with a broad range of IT lifecycle management solutions while maintaining best-of-breed depth in each solution by leveraging the Altiris SOA, which provides a common set of services to all Altiris solutions.
As discussed earlier in this white paper, the key components of the Dell model are element management, mapping and control, monitoring, orchestration, resource managers, support system, and application and OS. This chapter discusses how Altiris maps to these components of the Dell model. As mentioned in the “Architecture Overview: Dell” chapter, Dell anticipates growth in the formulation of SERD, whose fundamental value is interface standardization. Altiris continues to contribute to the growth of SERD with its consolidated asset repository (CMDB), an integral component of its solutions. This provides a solid foundation for managing all significant aspects of an element’s life. The Altiris SOA will be able to provide a complete solution for Dell’s service management needs.

Figure 6
The Altiris SOA is built on .NET and uses industry-standard technologies for storing, processing, and presenting data across distributed networks and the Internet.
Element Management Components

The Altiris SOA provides operational management of clients, servers, notebooks, or network devices—or any combination of these elements by interfacing with Dell’s instrumentation toolkits.

In addition, the Altiris SOA is responsible for managing the support system component of a resident on the local system, such as the Altiris provisioning agent, and handles other operational management provisioning components, including inventory, software distribution, and monitoring.

Mapping and Control (MAP) Components

For Dell clients, the Altiris SOA can leverage OpenManage Client Instrumentation (OMCI) if it exists and provide access to detailed hardware attributes that extend the content in the centralized CMDB. This gives customers access to more than 200 additional hardware and BIOS values, including thermals, asset tags, chassis intrusion, and more.

On the server side, the Altiris SOA maps to OpenManage Server Administrator (OMSA) via WMI, CLI, and SNMP and significantly extends monitoring capabilities beyond the applications and OS. By mapping to OMSA, the Altiris SOA provides information about thermals, voltage, ESM log details, and more.

Operational Management

The Altiris Agent is the foundation of the Altiris service-oriented architecture. Once an Altiris solution is installed, the agent is rolled out and enabled, as are any necessary packages. All critical information is automatically detected by a single agent. The result is powerful, flexible functionality. For example, administrators have the ability to reset a process from low priority to high priority based on a monitored metric, reorder priorities and stop processes on the fly, and more—all automatically and in response to monitored policies. Additionally, the single, SOA-enabled agent leverages tremendous efficiencies such as reduced overhead and less resource requirements. It practically eliminates agent incompatibilities common in environments that implement disparate tool sets. The Altiris agent also utilizes a common data transport mechanism across all Altiris solution sub-agents to efficiently report data back to the Altiris server. It also coordinates agent-side activities across different Altiris solutions so they work together to provide added value.

Provisioning

Altiris Deployment Solution provides simple, drag-and-drop deployment for Dell servers. Pre-built deployment jobs specific for Dell servers provide management of hardware and system settings from bare metal. Altiris® Management Suite for Dell Servers allows administrators to
deploy, manage, monitor, patch and update software on your Dell server infrastructure for Windows and Red Hat Linux environments. New integration with VMware Virtual Center and VMware integration tools provides unprecedented functions for provisioning physical and virtual environments from the single Altiris Console.

**Virtualization**

Altiris Deployment Solution 6.5 provides sample OS scripted install for VMware ESX servers, which allows quick and easy setup and configuration of Dell servers installed with VMware. Altiris Deployment Solution’s user interface controls provide granular management of virtual hosts and guests. The solution makes it easy to switch back and forth between the virtual and the managed computer (either host or guest) in the console.

Altiris® Software Virtualization Solution™, which is scheduled for release in Q4 2005, is a revolutionary approach to software management. By placing applications and data into managed units called Virtual Software Packages, Altiris Software Virtualization Solution will allow instant activation, deactivation or resetting of applications while avoiding conflicts between applications. All this without altering the base Windows installation.

**Monitoring Components**

Altiris provides both off-box and on-box monitoring capabilities to help determine health, performance, and availability of the elements in the system. Exception processing can occur either locally on the client to help eliminate network chatter and load on the server, or it can be processed on the server by performing the data and trends analysis as servers are monitored over time.

**Orchestration Components**

Orchestration components are handled by the Altiris configuration management and notification policies. Configuration management policies define how a system should look based on specific criteria, including organization membership and corresponding roles. Exception processing and orchestration are also handled by Altiris’ notification policy system, which allows administrators to monitor for exceptions to the system and tie in to other resource management components to correct exception situations.

**Resource Manager Components**

Altiris provides a wide variety of resource management capabilities. Depending on which Altiris solutions are installed, administrators can access detailed information about specific types of elements that need to
be managed, be they clients, servers, notebooks, or network devices. Altiris solutions provide specific functionality based on the configuration of the OS and applications.

**Support System Components**
Support system components are integral to the Altiris solution offering. Typically, the Altiris support system components are local to the client and perform activities as directed by the solution server-side components. Support types of activities include imaging, software distribution, and configuration, including security configuration, VLAN configuration, application configuration, and other configuration management activities.

**Application and OS Components**
Altiris provides robust capabilities for imaging, configuring, and deploying the OS as well as the applications that reside on the element. In Q4 2005, Altiris is scheduled to include its own software virtualization capabilities, which will give customers the ability to deploy applications to the system. These capabilities will allow administrators to bring applications up and down and maintain the state of those applications by resetting any undesired changes—all instantaneously. Dynamic provisioning of any application will be as simple as turning it on or off. Using Altiris technology, administrators will be able to change the role and affect the overall management of the system based on the application configuration.

**Standardizing: The Goal of Working Together**
Today, Altiris is well-positioned to implement the Dell architecture and is working to drive those standards and technologies that continue to redefine what best-of-breed management means to the industry, including the Scalable Enterprise Resource Directory. Altiris has a consolidated asset repository (CMDB) as well as an incident management repository that mesh with SERD to provide a solid foundation. The Altiris common data model provides comprehensive management to an element’s life, be it a desktop, notebook, server, or network device. In fact, Altiris is able to create a virtual repository based on a common data model, which allows the Altiris SOA to provide a complete solution for third-party IT service management needs.

**Dell OpenManage Client Administrator**—Dell and Altiris deliver a wide range of systems management solutions that include client, enterprise, and professional services offerings. Dell’s OpenManage Client Administrator is based on a subset of Altiris Client Management Suite, which is an award-winning systems management solution that reduces TCO for desktops, notebooks, and handheld devices. In fact, Altiris is the...
only Dell partner that shares the OpenManage brand, helping organizations deploy, manage, migrate, and troubleshoot clients within their environment from a central Web-based management console.

**Altiris Management Suite for Dell Servers**—Altiris developed Altiris Management Suite for Dell Servers to deliver on the core objectives of Dell’s scalable enterprise initiative to simplify operations and reduce complexity. To do this, Altiris extended its server platform to include significant integration with Dell hardware. Three key areas of focus are deployment, change management, and monitoring. Altiris’ tight integration with Dell allows organizations to effectively manage both hardware and software from one console.

In addition to working closely with Dell, Altiris continues to work with some of the most respected international hardware, software, and service providers in the industry. The following examples demonstrate these relationships.

**Altiris Connectors**—Altiris develops connectors to help reduce the cost of solutions as multiple suppliers compete for business. Altiris connectors integrate with an organization’s third-party systems to leverage user and organizational data from critical business systems. Designed to save organizations money by avoiding costly systems integration projects, Altiris connectors provide overall visibility into an organization.

**Altiris® Connector for Microsoft SMS**—Altiris was the first vendor to provide native integration with Microsoft Systems Management Server (SMS) and is the only vendor to provide an integrated Web console for SMS. Customers use the Altiris Connector for Microsoft SMS to tackle IT pain points not addressed by SMS, thereby extending their SMS infrastructure and more fully managing their enterprise.

**Altiris® Connector for HP OpenView**—Provides seamless integration that extends and enhances HP OpenView solutions, including Network Node Manager, Service Desk, and Operations. The complementary strengths of Altiris and HP solutions allow IT managers to implement a more comprehensive management solution that will prevent downtime, resolve problems faster, and keep systems running efficiently.

**Altiris® Connector for HP Systems Insight Manager**—While Dell chooses to enhance customer value by allowing Altiris to natively bundle OpenManage toolkits within Altiris solutions, other vendors choose to maintain separate toolsets for hardware management. For example, Altiris Connector for HP Systems Insight Manager (SIM) allows consolidation of deployment and management of HP clients and servers within a single SIM console. The connector extends SIM core functionality with client deployment, HP client hardware management, and access to additional Altiris lifecycle management functionality.
Altiris® Connector for Remedy—Automatically delivers hardware and software information to workers. Alerts generated by Altiris are automatically processed against Remedy’s Action Request System (ARS) or opened as work items within Remedy Help Desk, centralizing critical support data and improving services.

Philips SmartManage—Philips, a leader in display technology and consumer electronics, and Altiris provide IT administrators with the best in LCD monitor management—Philips SmartManage. Philips and Altiris offer complete IT lifecycle and asset management for all the devices in your organization.

CISCO AVVID and ACNS—Altiris is a Cisco AVVID (Architecture for Voice and Video Integrated Data) partner and works with Cisco to support Cisco ACNS (Application and Content Networking System) as an alternative to package servers in highly distributed environments.

VMware—Altiris and VMware are joint development partners and are working to improve manageability of the VMware virtual environments. Altiris is focusing on three key areas: (1) deployment of the VMware virtual environment, (2) awareness of VMware sessions (as reflected in hardware and software inventory), and (3) ongoing, remote management of VMware environments.

IBM ServerGuide Toolkit—To further optimize the deployment and provisioning of IBM servers, Altiris Deployment Solution for Servers is integrated with the IBM ServerGuide Toolkit 1.1.

Fujitsu Siemens Computers—Altiris and Fujitsu Siemens Computer are working together to ensure that Altiris IT lifecycle management solutions integrate with and complement Fujitsu Siemens Computers’ proven management capabilities. Fujitsu Siemens Computers also distributes and sells the entire line of Altiris solutions and suites.

HP—Altiris and HP provide best-of-breed solutions for HP partners and customers that are designed to further simplify and reduce the cost of owning desktops, notebooks, thin clients, handhelds, and servers. Altiris is HP’s client manageability partner and is a key part of the HP Intelligent Manageability strategy for the adaptive enterprise.

Other—Altiris is partnering with Intel on several new emerging technologies to help simplify and extend systems management. For example, Intel Active Management Technology allows IT managers to perform hardware inventory and hardware-related tasks, such as power management, when a computer is powered off or the OS is not present or functioning. Altiris is working with Intel and PC hardware vendors to continue to extend system management beyond the OS constraints.

These relationships are an important aspect of how Altiris works to meet the widest range of customer needs. Together, Altiris and its partners have provided critical solutions and shared the integration strategies to help customers work together to solve IT management challenges.
have provided critical solutions and shared the integration strategies to help customers work together to solve IT management challenges. Just as Dell’s vision of a global standard and a consolidated data base will save money, Altiris recognizes that partnering is a key success factor in maximizing the ROI on a customer’s IT investments and reducing the total cost of owning their IT assets.

**Altiris and IT Infrastructure Library (ITIL)**

While the Altiris SOA shares similar drivers to the Dell model, it is important to note that Altiris has elected to base its architecture and processes around the Information Technology Infrastructure Library (ITIL). While this white paper strives to map the Altiris SOA as a plausible implementation of Dell’s reference architecture, ITIL is the major driver behind Altiris product strategy. This design consideration has two primary customer benefits:

1. **Avoids the introduction of new terminology**

   Adopting ITIL definitions and processes avoids the introduction of new terminology thereby eliminating the confusion that is so often prevalent in technology evaluations. Often, customers must wade through vendor jargon in an effort to compare and contrast a solution fit. By adhering to recognized, existing ITIL conventions, the Altiris model is dramatically simplified.

2. **Encourages customer adoption of industry best practices**

   The Altiris ITIL orientation encourages customer adoption of industry best practices as they are designed, as much as possible, into the Altiris toolset. Typically, experienced enterprise customers are quick to acknowledge that oftentimes a tool is only as good as the processes that surround it. Altiris leverages ITIL recommendations as a key “source of management truth” and can therefore deliver solutions congruent with proven industry best practices.

Altiris IT lifecycle management solutions are certified ITIL-compatible by Pink Elephant (http://www.altiris.com/itil/). In addition to aligning organizational resources to ITIL processes, Altiris provides native integration to the tools technicians need to resolve incidents and problems, as well as execute change activities. Altiris IT lifecycle management benefits include:

- Complete support of end-to-end ITIL Service Support and Service Delivery processes managed within a single Web-based architecture and console

- Enterprise asset and service management leveraging centralized Configuration Management Database (CMDB)
- Automatic CMDB data population and relationship assignment through native auto discovery integration
- Management of incident, problem, and change processes leveraging context-aware execution tools
- Native service desk integration with software delivery, backup and recovery, remote control, OS imaging, PC personality and OS migration, and patch management
- Comprehensive release management includes packaging, preflight testing, application version tracking within a Definitive Software Library (DSL), and targeted software delivery
- Single point of administration for all Service Support and Service Delivery processes
Altiris is an effective implementation of Dell’s Scalable Enterprise Reference Architecture. Though an eventual global standard and a consolidated database is the goal, Dell and Altiris acknowledge that the implementation of this goal is rapidly evolving as the market continues to push IT boundaries and ideas.

Standardization is the critical factor to the consolidated database and is the basis of the approach described in this white paper and the vision as Dell and Altiris foresee it. Each area that is standardized will help reduce the cost of solutions as multiple suppliers compete for business. As Dell continues to push standardization, Altiris continues to contribute to it with its integrated solutions. In many respects, Altiris products comprise a prototype of Dell’s standardization vision—Altiris is proof of concept of Dell’s vision. And though Altiris strives to offer affordable lifecycle management solutions for organizations of any size, Altiris recognizes the need to provide a standards-based connectivity layer that allows it to tie in information from third-party repositories, such as directories or other data repositories. This further substantiates the value of standardization because organizations can easily leverage their existing products and processes with Altiris products.

Dell’s focus on standards, flexibility, interoperability, and scalability are hallmarks of the Altiris SOA and are key drivers for growing adoption of Altiris products by today’s customers, who must balance current management needs with the future’s advancements.

As leaders in the development of IT lifecycle management solutions, Altiris and Dell continue to drive industry standards that will help customers address critical business issues such as security, compliance, change management, and so on.

“[The Dell and Altiris platforms...are truly the best in their respective markets...and both are the only products that have been able to meet our needs... When we learned that there was a partnership between the two, the choice was obvious. Now we have a standard hardware platform, a software solution to manage it, and the two are designed with each other in mind. That is the key. There are plenty of products on the market, but few are made to integrate seamlessly. When the leaders of two markets work together, the customer always benefits.”

—Donald Rowland Sr.
SR Technical Support
HealthNow
Dell’s Scalable Enterprise Reference Architecture is outlined primarily in three different documents:


These documents suggest a high level model that allows for varying implementations. IT is provided as a standards-based reference to help customers identify high value solutions that maintain customer choice.