

HP-UX 11i software deployment and configuration tools

Simplifying management of servers in a virtualized environment



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Introduction

The pace of change in today's business world is unrelenting, placing intense pressure on IT organizations to keep up with business demands, while improving performance, mitigating risk, increasing agility, and maximizing return on IT investments. It's a tall order. But the right tools can help IT organizations move from a reactive state to a proactive one to transform change into opportunity—to reduce IT cost and complexity, adapt in real time to business needs, and free up resources for innovation.

The Adaptive Enterprise—business and IT synchronized to capitalize on change—is the HP strategy for enabling this transformation, applying the principles of modularity, integration, standardization, and simplification consistently across business processes, applications, and infrastructure. HP-UX 11i operating environments provide essential building blocks for the Adaptive Enterprise, leveraging industry-standard architectures to reduce cost and simplify change, advanced virtualization technology to optimize utilization and enable IT supply to automatically meet business demand, and sophisticated management to automate the dynamic link between business process and IT resources.

This white paper focuses specifically on HP-UX 11i software deployment and configuration tools that enable system administrators to better manage servers in a virtualized environment. The fact is, intelligent management becomes increasingly important when resources are virtualized, and HP is continually enhancing HP-UX 11i tools to simplify the management of such complex and dynamic environments.

Simplifying management in dynamic, virtualized environments

Virtualization is made possible by the Virtual Server Environment for HP-UX 11i, which supports hard partitions and virtual partitions, and dynamic resource sizing and goal-based workload balancing are made possible by the HP-UX Workload Manager. These powerful tools enable IT administrators to optimize utilization by pooling and sharing resources. Yet, virtualized server environments present new challenges when it comes to rapidly deploying and reconfiguring systems to meet dynamic computing needs.

With multiple virtual partitions across multiple server platforms, the use of traditional management tools to perform routine administrative tasks is no longer an efficient or effective option. The dynamic nature of the Adaptive Enterprise demands that the number and length of maintenance windows be reduced significantly, and that the risk of operator errors be tightly controlled. To achieve these goals, it is essential to have a new breed of management tools that can visualize resources in a virtualized environment, automate system configuration tasks, and apply software updates and security patches quickly and consistently.

HP-UX 11i system management tools enable administrators to do just that. Designed to take full advantage of virtualized resources and the Adaptive Enterprise, HP-UX 11i system management tools

simplify and automate many low-level administrative tasks, while providing tight integration with higher level tools, such as HP Systems Insight Manager, for managing multiple systems—even heterogeneous systems. This comprehensive management approach puts administrator control where it is needed most, while employing an increasing level of automation to create a dynamic link between business process and IT resources.

The result is simplicity, agility, and value—enabling IT organizations to increase resource utilization, improve staff productivity, and maximize return on IT investments.

HP-UX 11i management solution overview

Today more than ever it is critical that IT organizations maximize efficiency, agility, and strategic value. Administrators must focus on meeting business goals, rather than the low-level details of routine system management. Therefore, automating routine tasks and gaining visual insight into system and enterprise conditions is of paramount importance.

HP provides a full range of management solutions for the Adaptive Enterprise based on this need—from enterprise management, to multi-system management, to single-system management. In particular, the system management tools for HP-UX 11i provide the intelligent automation needed to streamline detailed single-system administration, while meeting business requirements. Most important, these tools are tightly integrated with higher level multi-system and enterprise management solutions to provide a consistent and efficient experience from top to bottom.

To ensure that HP-UX 11i management tools support the most critical needs of IT managers, HP has conducted extensive customer research to better understand usage patterns and administrative issues. By employing a contextual design process, HP has been able to build real customer use models and apply them to HP-UX 11i tools. In addition, each tool has undergone rigorous usability testing throughout the design process to maintain a tight correlation between tool functionality and user need. The result is an integrated set of tools that simplifies routine tasks and reduces errors, while providing IT managers with highly efficient deep-level system control where needed.

HP-UX 11i management tools – design approach

In designing HP-UX 11i management tools, HP has focused on providing the functionality and accessibility most needed by users. Therefore, we have designed these tools to be intuitive, fast, and visual to ensure the highest levels of efficiency and effectiveness.

With growing complexity, exacerbated by virtualization, concerns are growing every day about having the right skill levels in IT. Therefore, it has never been more important to have management tools that can cut through the complexity to simplify tasks and reduce errors. HP-UX 11i management tools are designed with this understanding and provide administrators with the ability to “see” the various system elements and the relationships among those elements—including virtualized

resources—across the enterprise. Armed with this information, administrators gain a clearer understanding of their system configurations and the impact that configuration changes will have on the various services being supported. This kind of insight is essential in the Adaptive Enterprise, where virtualized resources are dynamically managed to meet changing business demands. With the efficient access and system control of HP-UX 11i tools, administrators can make better decisions, in a more timely fashion, and with a higher level of accuracy.

HP-UX 11i includes a full portfolio of management tools for automated software deployment and visual system configuration. Across the tool set, users are presented with a consistent look and feel in executing tasks, providing the foundation for managing all the systems in your enterprise in an efficient and cost-effective manner. In addition, a choice of user interfaces—including command line interface (CLI), terminal user interface (TUI) and graphical user interface (GUI)—provides access flexibility to suit individual user preferences and skill levels. The overriding objective is to enable administrators to deliver higher quality of services with less effort and lag-time, while realizing a greater return on IT investments.

Enhanced command line interface

To reduce time and errors, an enhanced command line interface combines multiple complicated command sequences into single, simple commands, with built-in error checking to dramatically reduce the chance for errors. The CLI incorporates a number of features previously only available through the GUI interface, so that the full range of administrative tasks can be performed regardless of whether GUI or TUI interfaces are available. It's fast, light-weight, and accessible through a serial console, secure web console, or remote terminal.

Menu-driven terminal user interface

Many HP-UX tools also provide an interactive terminal user interface. For fast system access from a system console or through low bandwidth connections, the HP-UX 11i menu-driven TUI provides an intuitive, learn-as-you go approach to system management. This light-weight interface includes built-in checking to minimize errors, with broad terminal-type support and CLI previews that allow junior administrators to learn what is happening “under the hood.”

Graphical user interface

To provide environment visualization, as well as simplify complicated tasks, a GUI is provided, which can display rich graphical diagrams to visualize complicated system configurations and relationships between components. The GUI provides an easy way for junior administrators to quickly become productive with HP-UX 11i, while offering more advanced users a fast, efficient way to perform routine tasks—especially when time is limited. The GUI provides detailed system information, along with the ability to configure the system, all in one place and presented in a highly visual format. And because many of the newer tools are based on HTML and support SSL, the GUI ensures secure accessibility through standard web browsers from anywhere, any time, regardless of platform.

The availability of command previews from within the GUI is also a valuable productivity enhancement and teaching aid. For example, administrators new to HP-UX 11i can quickly come up to speed by learning how GUI functions correlate to actual commands. In addition, more experienced administrators can verify what the GUI is doing, as well as cut and paste command sequences into scripts to develop advanced, automated routines.

Through any of these interfaces, administrators can deploy and maintain HP-UX 11i systems with a high degree of efficiency, flexibility, and accuracy.

HP-UX 11i management capabilities

Building on the knowledge gained from direct customer input, HP-UX 11i management tools incorporate the ease of accessibility, intuitive usability, and breadth of functionality administrators need most.

In addition to the software deployment and configuration management tools highlighted in this paper, HP offers a complete suite of industry leading workload management tools for HP-UX 11i, including the Process Resource Manager (PRM), goal based Workload Manager (WLM), and the GlancePlus Pak set of performance monitoring and analysis tools. (See Figure 1)

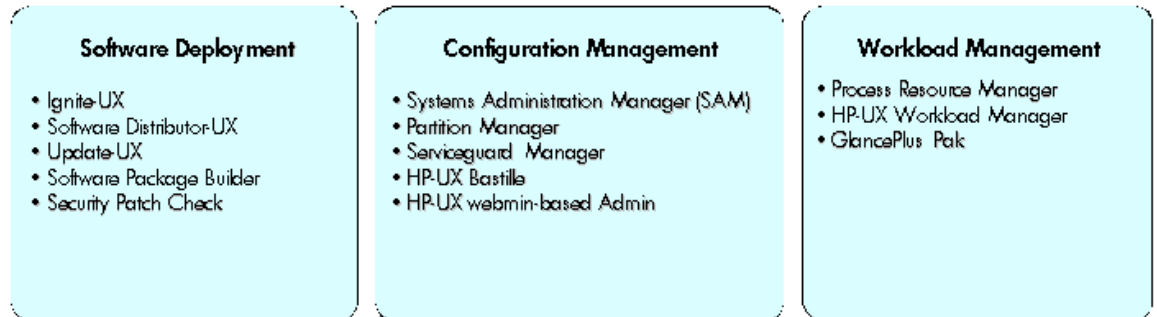


Figure 1 – HP-UX 11i system management tools

Software deployment

Software deployment tools, such as Ignite-UX and Software Distributor-UX, enable administrators to automate the distribution of HP-UX 11i operating environments, software, and patches.

Following customer use models, these tools provide the flexibility to choose what to install and how to install it. Ignite-UX, for example, is capable of automating highly complex and sophisticated systems. It allows administrators to bundle multiple software packages into a single image and distribute the image to multiple servers from a central location—as in a production environment. It is also easy to

make minor configuration changes such as adding point patches, without having to regenerate a new system image.

In addition, Ignite-UX provides administrators with the flexibility to perform customized updates on a system-by-system basis—such as in a development environment—with the assurance that the process will be repeated consistently and reliably. This same process can also be captured and automated for future deployments.

Ignite-UX also includes a sophisticated set of utilities for quickly and reliably recovering systems that have gone bad due to operator error or hardware failure. Systems can be saved and recovered from tape or CD-R media, as well as over the network.

Working in conjunction with Ignite-UX, Software Distributor-UX maintains a database of installed software and provides the ability to verify integrity down to the file. By keeping track of software and patches on media or in network-based software depots, Software Distributor-UX provides administrators with a fast and efficient means to perform installations. Software Distributor-UX automatically selects applicable patches, filtering them based on target system configurations. This tool has built-in intelligence to check and resolve file set dependencies, verify system compatibility, and correctly sequence installation and configuration to ensure proper behavior. Its hierarchical structure also allows system administrators to interact with Software Distributor-UX at different levels of granularity depending on each administrator's level of expertise or the level of detail needed.

For patch management, HP-UX 11i provides a web-based repository where administrators can check for new patches, select patch bundles or individual patches as desired, and apply them using Software Distributor-UX. In addition, Security Patch Check is available to analyze systems for security vulnerabilities and recommended specific patches for security vulnerabilities. All software and patches from HP are provided in Software Distributor-UX packaging format.

These sophisticated and flexible software deployment tools remove the guesswork and ensure error-free deployments—improving administrator productivity and efficiency, while dramatically reducing system downtime due to errors.

Configuration management

For configuration management, HP-UX 11i includes a suite of tools such as System Administration Manager (SAM). SAM has been enhanced to address the needs of today's virtualized IT environments. In addition to providing significant performance improvements, the new kernel and peripheral device configuration areas of SAM have been enhanced with an HTML-based web interface, which minimizes network consumption, simplifies accessibility, enhances system visualization, and provides seamless integration with higher-level multi-system management environments such as HP Systems Insight Manager (HP SIM).

SAM includes a full range of configuration management capabilities, including:

- Kernel configuration
- Device configuration
- Disk and file system configuration
- User and group configuration
- Printer and plotter configuration
- Security configuration
- Network interface configuration

Among this breadth of capabilities, new intelligent kernel configuration is of particular importance. With advanced kernel configuration capabilities, administrators are able to closely monitor systems, then make configuration decisions based on what has been observed. One powerful feature of the new kernel configuration tool is the capability to monitor certain kernel parameter values over time. This allows administrators to avoid the time consuming trial and error approach previously associated with kernel tuning. Many of the most commonly changed kernel parameters have been made dynamic to allow systems to be tuned without re-booting. In addition, administrators have the ability to set thresholds, which will trigger alarms as kernel parameters begin to grow and approach or exceed those thresholds.

Threshold alarms enable administrators to proactively tune the kernel before a problem is critical. Data on major resource consumers provides notification if the kernel needs tuning, or which rogue process needs to be restarted. Trending data advises administrators on which parameters to tune and by how much. With dynamic kernel tuning, administrators can fix problems quickly without any disruption to the applications.

In addition to SAM, Partition Manager provides a level of infrastructure visualization that is unique in the industry. (See Figure 2 below) This capability is especially important in a highly virtualized environment, where it becomes increasingly difficult to manage resources across multiple physical partitions. With Partition Manager, administrators gain a rich, graphical representation of all infrastructure resources and their relationships.

One of the primary design goals for Partition Manager was to build in high availability intelligence. For example, when creating new hard partitions or modifying existing hard partitions, Partition Manager determines whether or not the new configuration will introduce single points of failure (SPOFs) and, if so, warns the administrator of the potential risk. Also, because everything is presented visually, the administrator can also be certain that as resources are reallocated from one partition to another, they will not adversely affect services that need them. It is a powerful, yet flexible, way to manage a dynamic, virtualized environment with confidence that critical service levels will be maintained without disruption.

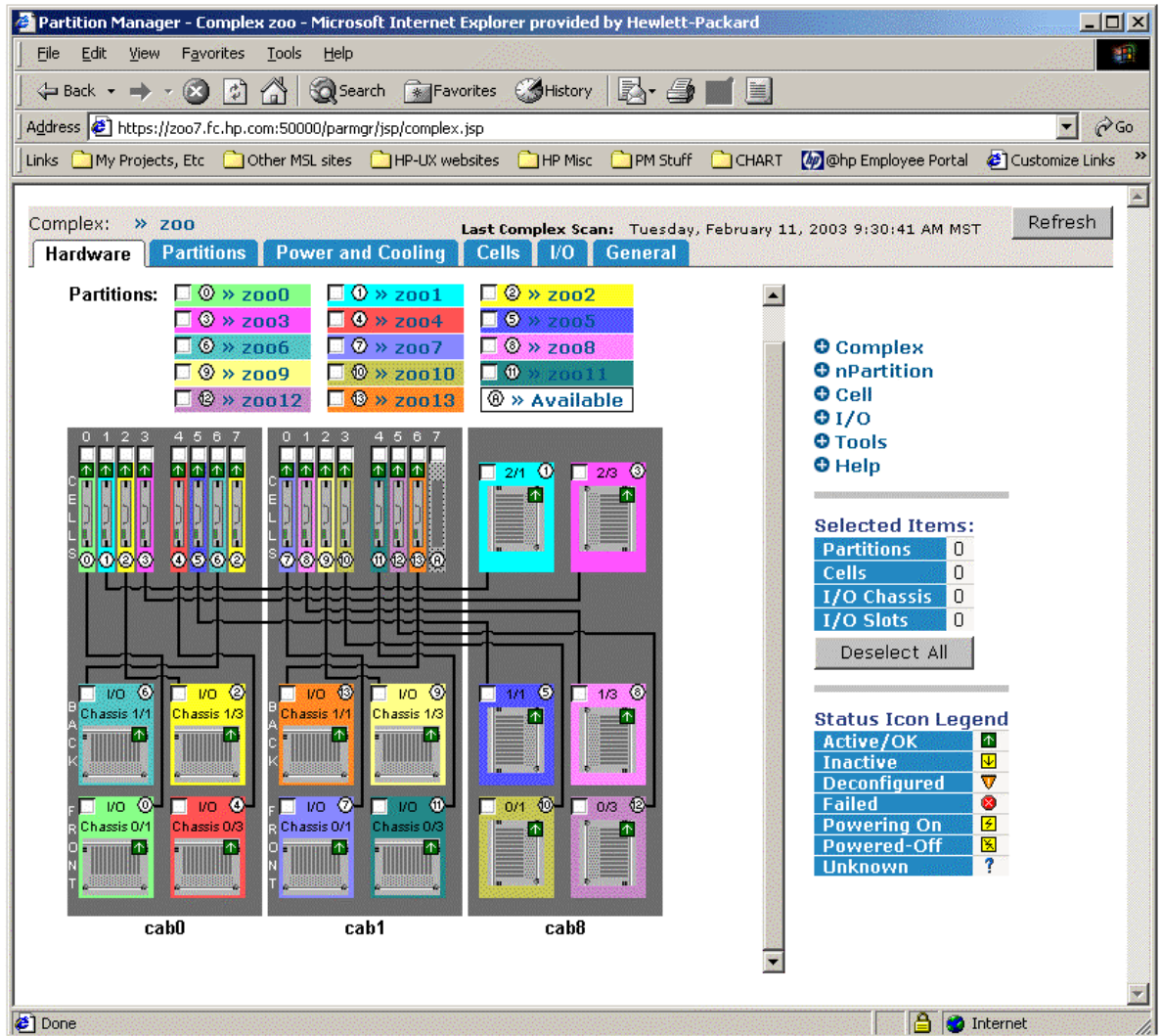


Figure 2 – Partition Manager

For both software deployment and configuration management HP-UX 11i management tools provide administrators with the control, flexibility, and performance they need to support enterprise business demands efficiently and with the highest quality of service.

Providing an end-to-end management solution

HP Systems Insight Manager (HP SIM) is a solution for providing centralized management of multiple HP-UX servers. And as plug-ins to HP SIM, HP-UX 11i software deployment and configuration management tools are always just a click away whenever precise resource-level administration is required. Also, HP SIM provides a common tool to manage across heterogeneous platforms, including HP-UX 11i, Linux®, and Microsoft® Windows®, and it acts as a launching pad for a wide range of other tools. HP SIM enables administrators to proactively manage system faults, assets, and

hardware configurations on servers and other HP devices from a single application. Auto-discovery allows new systems to be incorporated into the centralized management console quickly and easily.

With secure, single sign-on authentication, HP SIM allows administrators to easily move from system to system without the need to enter multiple passwords, while role-based access control restricts users to only those operations for which they are authorized. In addition, centralized logging provides an audit trail of the operations performed by each user.

Ultimately, management for the Adaptive Enterprise seeks to create a dynamic link between business and IT, enabling IT organizations to adopt a service management culture. HP provides administrators with efficient and integrated service management environments that abstract detailed system information to provide multi-system and enterprise-wide management perspectives, with the control to seamlessly drill down to HP-UX 11i system management tools as needed.

For this higher level of management, HP-UX 11i is supported by enterprise management environments from all the major vendors, including HP OpenView, BMC Patrol, Computer Associates Unicenter, and IBM Tivoli. With HP OpenView Operations, for example, administrators can correlate the impact of IT infrastructure on business-critical services, such as e-mail, ERP, and e-commerce. OpenView Operations builds on an extensive policy base to monitor operating system and application attributes, and provide automated responses to common events. In addition, OpenView Network Node Manager provides robust standards-based management for heterogeneous networks. This intelligent tool discovers and graphically displays complex network configurations and monitors network infrastructure availability, so that IT staff can identify the components that make up the enterprise network services, and understand their relationships.

Armed with such enterprise information, HP OpenView helps IT organizations to increase staff productivity and efficiency, while meeting dynamic usage demands and optimizing total cost of ownership.

Conclusion

HP-UX 11i provides a rich set of tools to support management in the Adaptive Enterprise. Designed based on direct customer input, the latest generation of HP-UX 11i system management tools reflects the real needs of today's IT administrators, who must manage a dynamic, highly virtualized environment with smaller staffs and reduced budgets.

With HP-UX 11i system management tools, administrators gain the performance, accessibility, and efficiency they need to succeed. HP-UX software deployment and configuration management capabilities automate routine administration and simplify many complex tasks, while providing deep-level system control where needed. The choice of an enhanced CLI, menu-driven TUI, and web-based GUI ensure that both experienced and junior administrators alike can be productive quickly when working with HP-UX 11i. In addition, these single-system tools also work seamlessly with higher level

multi-system and enterprise management environments, including HP Systems Insight Manager and HP OpenView. As a result, administrators gain more visual abstracted views of their heterogeneous IT assets, while also having the ability to automatically launch HP-UX 11i management tools from within Systems Insight Manager or OpenView when system-level precision tuning is required.

From end to end, HP provides comprehensive management for the Adaptive Enterprise, employing built-in intelligence, flexibility, and increasing levels of automation to enable a dynamic link between business process and IT resources. So, administrators can work more proactively and strategically, turning IT into a powerful competitive advantage for the business.

For more information

For more details on HP-UX 11i system management tools, Systems Insight Manager, or HP OpenView, please visit:

<http://www.hp.com/go/hp-ux> (select manageability)

For HP-UX 11i documentation, please visit:

<http://docs.hp.com/hpux/os/11iv2/index.html>

HP-UX 11i training available

For a schedule of training classes available for HP-UX 11i management tools, visit:

<http://education.hp.com/curr-unix.htm>

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