



TODAYS ENTERPRISE APPLICATION VIRTUALIZATION USING TERMINAL SERVICES AND VDI

FREE WHITE PAPER

Terminal Services, (SBC), VDI, or
Application Virtualization and Streaming
What are your options?

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ABSTRACT

Management of users' applications and desktops has always posed challenges to IT managers. Deploying, upgrading, patching, protecting and maintaining high availability is only part of the hectic, behind-the-scenes activity that keeps the IT department busy. Over the recent years, IT departments are constantly required to cut costs while increasing operational flexibility, delivering superior service, and maintaining high service level agreement (SLA). Moreover IT organizations are obliged to operate under ever growing IT complexity, and at the same time to respond quickly to changing business needs and requirements .

In light of the current world financial crisis, this trend is stronger than ever before. Jetro COCKPIT4® can help with these challenges by converting enterprise applications into virtual services that are manageable, secured, centrally hosted and flexible to changes and modifications.

Jetro COCKPIT significantly reduces IT complexity and the labor associated with deploying, updating, and managing enterprise applications. By helping IT organizations decrease total cost of ownership (TCO), increase SLA, respond quickly to changing business needs, Jetro COCKPIT can serve as a powerful tool that delivers a competitive advantage and enables organization of all sizes to achieve more with a shrinking budget.

This white paper examines some of the available Applications Access technologies and Desktop Delivery methods in the market. We'll begin with an overview of the major technologies in the marketplace, their typical usage scenario, and the advantages and disadvantages of each. We will then look at the recent release by Jetro Platform COCKPIT4, its capabilities and how it enables organizations to save time, power and space, and gain improved security. Furthermore we will describe how Jetro COCKPIT enables savings through competitive pricing and licensing, which lower both acquisition and ongoing ownership cost.



APPLICATIONS ACCESS AND DESKTOP DELIVERY, TECHNOLOGIES OVERVIEW INTRODUCTION

INTRODUCTION

Organizations today have many choices when selecting their application access strategy. However, numerous approaches, lack of sufficient knowledge and incoherence definitions might cause confusion that may negatively affect the decision taking process, waste of valuable resources, and lead to a loss of time and money.

This section provides a short overview of the major applications and desktop delivery technologies available today, their typical usage scenarios, and the advantages and disadvantages of each.

The technologies to be covered in this section include:

- Remote Desktop Services (RDS)
- Virtual Desktop Infrastructure (VDI)
- Application virtualization & Application Streaming
- Plain Terminal Services – on Microsoft Windows Server 2008

SERVER BASED COMPUTING

Server-based computing (SBC) is a technology whereby applications are deployed, managed, supported and executed on a server instead of on a client; this enables sharing the same copy of an application among many users. Data processing takes place on the server, while data files are stored in a file-server or central storage.

At the heart of an SBC solution resides Microsoft's "Remote Desktop Services" (RDS), which is a Windows server OS standard component. RDS is in fact based on Microsoft's mature Terminal Services (TS) technology that has been around more than a decade. TS became a standard component since the release of the Windows 2000 Server (prior to that TS was part of Windows NT Server 4.0, Terminal Server Edition).



RDS makes it possible to install and manage applications on centralized servers in the datacenter, and have it controlled and accessed from virtually anywhere. RDS virtualizes the applications presentation-layer, by delivering "screen images" to the users' client machines. Users, in turn send keystrokes and mouse movements back to the server. A designated "presentation Protocol" (RDP or ICA) is responsible for displaying and managing the flow of information to the client device, however, real data never leaves the server and this is a key element in RDS based solution.

SBC solutions with RDS enable administrators to present users with individual applications and data they need to perform their job. Alternatively users can be presented with an entirely remote desktop. From the user point of view, applications appear, look and behave identically to locally installed applications. Properly designed, SBC solutions incorporate features such as administration consol, load balancing, session control, universal printing, users' support and system redundancy for high availability.

ADVANTAGES OF SBC

- Rapid deployment and expansion of applications
- Access to corporate applications from virtually anywhere
- Location and access device independent (PC, thin client, mobile device, windows or Linux workstation)
- Extract more from existing desktop hardware, and decrease maintenance costs
- Enables use of thin client devices (cheap access device instead of costly PC)
- Significantly lowers administrator staffing costs
- Eliminates the need for frequent upgrades to desktop OS and application
- Higher level of security - no viruses from the desktop helps to prevent theft of company data
- Reduces risk of data loss - data is centralized and backed up daily



- Reduces bandwidth costs – no real data travels on the network only screen images
 - Reduces or eliminates the need for remote office servers
 - Improves users support and uptime (waiting for help desk response)
 - Improves system and application availability through redundancy and disaster recovery capabilities
 - Enables standardization and keeps streamline corporate applications
 - Reduces or eliminates installation of non productive software such as games

DISADVANTAGES OF SBC

- Limited Personalization - users share the same set of application on the Terminal Server according to configurations and preference as set by the system administrator
- Driver incompatibility between Server OS and desktop OS
- Local printing – a complex issue that requires a great deal of knowhow and expertise
- Some applications might be incompatible with TS (Due to poor performance or need their own dedicated IP)

LEADING SBC SOFTWARE SOLUTIONS PRODUCTS:

CITRIX WITH XENAPP VS. JETRO COCKPIT WITH MICROSOFT'S TERMINAL SERVER 2008/R2

VIRTUAL DESKTOP INFRASTRUCTURE (VDI)

Virtualization is the hottest tech buzzword in the last several years. It seems that everything became virtualized: servers, storage, networking, applications and of course - users' desktops.

Virtual Desktop Infrastructure (VDI) was first introduced by VMware as a method to provide central computing. However, VDI is not a product by itself, but rather a technological concept.



Virtualization in its essence enables multiple operating systems, to be hosted on one computer, as virtual machines (VM). The hosting computer (virtual host) runs a virtualization layer that can either be installed on the bare-metal, called hypervisor (VMware ESXi for instance) or installed as an application on the OS, called hosted (VMware Server for instance).



In VDI scenario, users access their Windows XP, Vista or Linux desktops VM by means of another workstation or thin client device. Users may be given unique-personal desktop, configurations and personalized working environment - or randomly provisioned desktop form the corporate VMs pool depends on the corporate policy and user role.

Data processing take place on the personal desktop (like any other PC) while data storage takes place on the personal desktop, on the fileserver or at the central storage. The presentation protocol in a VDI environment can be RDP, VNC, VI3 or ICA (Other protocols such as RGS, or SPICE are perceived as proprietary protocols compared to the "standard" RDP, or VNC.)

Although some players on the market push VDI solutions as a major technology for central computing and as a substitute to RDS, it is in fact a complementary technology to SBC since it addresses some of the weaknesses of RDS.

A virtual host machine enables VM to run individually while sharing the same physical hardware resources (CPU, memory, networking and storage). Virtual hosts by their nature give each VM (desktop in our perspective) an isolated running environment, including OS, applications and session. Thus users are not dependant on each other and are protected from faults caused by other users, sessions or applications.

ADVANTAGES OF VDI:

- Reduces device driver incompatibilities by using original desktop OS drivers
- Policy-based dynamic resource allocations (CPU, memory, networking)
- Prevents adverse session interactions and increases overall stability, users access their VM by an isolated session, this
- Better personalization – users have more control over their desktop and can customized and configure it to their needs (applications, preference, configurations)
- Good solution for power user who need more resources or more than one desktop or OS type simultaneously (Windows and Linux for instance)
- Addresses incompatible applications with TS as well as poorly applications or applications that need their own IP
- Rapid Client Deployment by coping the same image as many times as needed (Image = OS + applications)
- Improved Data Security by having centralized personal workstation
- Helps to maintain streamline corporate desktop and applications



- Green IT, approximately 15-25 VMs can be hosted on virtual host, saving power, cooling, cabling and floor space

DISADVANTAGES OF VDI:

- Costly enterprise class hardware and software are required (Servers, Storage, and hypervisor and management software)
- Complex desktop management and support - OS Patching and applications updates are required just like any client workstation machine. Supporting 200 users takes 200 individual virtual machine to support, (In TS setup, roughly 3 servers will do, to serve the same number of users)
- Increased IT complexity and thus more skilled (and costly) IT staff is required, one that familiar with virtualization host management, user management and applications
- Limited scalability – TS can host 30-100 users per dual CPU / Dual core server. Same server machine in a VDI setup may host 15-25 VMs depends on the VM configuration and user profile
- Printing to a locally attached printer is still a major issue due to the complexity of the supporting infrastructure

MAJOR PLAYERS OF VDI SOLUTIONS:

VMWARE, LEOSTREAM MICROSOFT AND CITRIX

APPLICATION VIRTUALIZATION & APPLICATION STREAMING

Application Virtualization and Application Streaming are two independent and complementing technologies. This section will describe each technology and present the usage scenario of combining both.



APPLICATION VIRTUALIZATION

Virtualized applications are centrally managed and stored, however, executed locally on user client desktop. Application Virtualization is then the method to deploy applications by cutting the bond between the OS configuration and the applications' configuration. This is made possible by creating a "bubble" around the application, so the application has a loose relationship with the OS. A virtualized application is not installed in the standard way - however, it looks, behaves and runs as if it were. Application Virtualization requires a piece of software (sometimes refers as an agent) which runs on the local desktop or on a TS. The agent is responsible for creating the virtual environment in which the applications are executed. The virtual environment contains essential virtualized OS components such as: registry, files, fonts, INI, COM and environment variables. Furthermore it is responsible for the links and calls to the OS resources that are necessary for application execution.

APPLICATIONS PACKAGING

Virtualized application starts in packaging the application into a fully independent environment, or bubble. This is done with the help of the packaging tool. The packaging process is composed of several stages in which the application is installed into the bubble, configured, tested and run. During the various stages the packaging tool "records" the configuration links, registry setting, INI and other variables that are being used during the execution, and saves them into the bubble for future use. The packaged application is commonly known as an Image.

The application now is ready for deployment on a desktop / TS or to be streamed (as will be explaining further down in this section). The key point in virtualized applications is Isolation. Since the application runs in a bubble, it does not interfere with other applications, users, or sessions and so can inherently address some of the weakness of other methods including:

- Ability to run different versions of the same application on the same machine
- Limits upfront the resources available for each application – preventing one single application tend to take over the entire server resources (CPU, Memory, etc.)
- Provides rapid, safe, clean and instant rollback during application deployment, migration or testing new version, since the virtualized application leaves no traces on desktop / server



APPLICATION STREAMING

Application Streaming is a form of on-demand applications distribution. However, before Application Streaming takes place the application has to be virtualized (as described in the previous section). The principle behind application streaming has to do with fact that at any given moment only a specific portion of a program is needed in order for it to run properly. As soon as the application is launched, key functionalities are made available to the user. When more functions are requested, they are shipped (Streamed) on demand to the user. Streaming in general means that the application does not have to reside on the client computer fully, but to be transmitted over the network, in parts, and when needed.

STREAMING SERVER

The Streaming Server is the mechanism that stores the application images and streams them to the users' desktops. The streaming process begins with the launch of an application – or by having the user click the relevant icon. The Streaming Server then sends that portion of the application code needed to get the application initiated at the user desktop (about 30% of the entire code in most cases). The rest of the code streams up on request.

APPLICATION VIRTUALIZATION & APPLICATION STREAMING ADVANTAGES

- Simplifies the complexity associated with applications deployment (Installation, upgrade, roll back scenarios, etc.)
- Allows for rapid OS / applications migrations and deployment
- Enables centralized application management, yet local execution
- Makes applications available to users even when the user is off-line (local cached copy of the application is created on the local machine)
- Allows incompatible applications to run side-by-side
- Helps to maintain standard OS, application and configuration across the enterprise via configuration standardization
- Minimizes support requirements



PLAIN TERMINAL SERVICES – ON MICROSOFT WINDOWS SERVER 2008 (1)

Microsoft Windows Server 2008 (WS08) includes significant improvements and new features over previous versions. These include: Enhanced security and compliance, improved networking performance, better control over remote infrastructure, simplified server management, improved scripting and task automation, Hyper-V virtualization technology and more. Terminal Services under new name (RDS) have also been improved and includes:

Enhanced User Experience - Multi-monitor support, Media Player redirection, bi-directional audio, and bitmap acceleration for 3D applications

Connection Broker - Session based load balancing for RDS and VDI

RemoteApp – Seamless windows, application publishing and session sharing.

Web Access - To application and remote desktop

RD Gateway - Secure access to applications for users outside the firewall or untrusted network (no VPN infrastructure required)

RD Easy Print – Printing redirection to user client machine (no server side drivers)

Although RDS (discussed previously in this paper) has improved its feature-set, it is still more suitable for organizations with simple deployment scenarios. A more complex IT environment requires additional enterprise-level of management, delivery and provisioning capabilities that RDS cannot provide in itself. The following points help to demonstrate this claim:

Although RDS (discussed previously in this paper) has improved its feature-set, it is still more suitable for organizations with simple deployment scenarios. A more complex IT environment requires additional enterprise-level of management, delivery and provisioning capabilities that RDS cannot provide as-is. The following points help to demonstrate this claim:

- In order to fully benefit from the rich feature set of WS08 as described above:
 - All terminal servers in the farm should be WS08 – this is unlikely scenario in the enterprise where a heterogeneous IT infrastructure exists and upgrades processes and alignment take time.



- All clients' desktop machines should be Windows XP or above – meaning users with thin clients, Linux desktop or earlier windows version (windows 98 windows 2000) can have remote desktop only.
- Web access does not allow presenting different applications set for different users or groups (unless all servers in the farm are identical) - In a web access scenario all users have access to all published applications regardless their role.
- Every TS in the farm needs to be managed individually - for instance publishing the same application from multiple servers, the administrator has to publish individually or copy the application package on a server by server basis with no single point of management and configuration.
- Connection Broker provides session based load balancing; it does not however take into accounts the real load on the server / entire farm resources (CPU, Memory I/O etc.). Rather, it counts the number of connected sessions for each server. Sessions as a sole parameter rarely tells the real story. Moreover setting priority to applications; resources optimization and customizing simply cannot be done with Connection Broker.



JETRO COCKPIT[®] 4

INTRODUCTION

Jetro COCKPIT[®] is the flagship product of RDT-Jetro, a leading enterprise-class software suite that effectively manages and secures Server-Based Computing (SBC) network environments. This section discusses the latest release by RDT-Jetro, "COCKPIT4", its main capabilities, advantages, benefits, and how it helps organizations reduce costs and increase productivity. COCKPIT represents significant improvement and new functionalities compared to previous COCKPIT versions as well as plain Microsoft RDS and competing solutions.

COCKPIT Improvements include enhances performance, new management application, improved printing capabilities (network and universal) maximized security, high availability through innovative farm design and new intercommunication architecture between the various farm components (farm, site, zone and user).

COCKPIT-for-internet "COCKPIT4i[™]" Jetro Platform's award winning solution for secured enterprise web browsing infrastructure is now also an integral part of COCKPIT4.

COCKPIT - PRODUCT OVERVIEW

Jetro COCKPIT is a comprehensive SBC solution. COCKPIT allows IT professionals to standardize the corporate IT environment, extend desktop hardware life, support scattered organization, through a centrally controlled and managed IT infrastructure. This helps significantly reduce the organization's overall IT costs, increases agility and responsiveness to the ever-changing business needs.

MAJOR IMPROVEMENTS

Enhances Performance - Jetro COCKPIT offers a robust and secured foundation for enterprise business application. By serving more users, sessions and applications per TS over the same resources, COCKPIT requires less server hardware, thus less OS licenses, backup agents and IT staff etc.

Improves Effectiveness - Efficient Load balancing is a key capability in SBC deployment. COCKPIT delivers the most effective solution in Server-Based Computing available today. With hundreds of performance counters and numerous unique features, COCKPIT enables administrators to fine-tune and match the ultimate load balancing policy for addressing the organization's specific needs.



Reporting and Monitoring - Integrated reporting and monitoring allows administrators to maintain, plan, monitor, control, track trends and to respond to changes and situations immediately. The system actively alerts via SMS / Email on events as set by the administrators.

Comprehensive Printing Solution – Printing in SBC environments have always been a challenge to IT staff. COCKPIT provides a comprehensive, seamless and centrally managed printing solution. The built-in printing solution saves time, significantly lowers TCO and saves money by eliminating the need to purchase costly third party products. The printing solution supports EMF, PDF, PostScript, universal drivers and user's native drivers.

Printing can take place based on predefined condition such as: user name, computer name, printer name, mapping printer to specific application or session. Complicated printing issues including checks printing, preprinted-forms, barcodes and stickers are now made possible.

Simplicity and Ease of Implementation – COCKPIT architecture is designed to be simple - yet powerful. Increased high availability is gained through innovative farm design and new intercommunication architecture between the various farm components. Temporary failure of any of the farm components, for instance (site, zone or server) will not disturb the normal operation of the rest of the organization.

The quick implementation and ease of maintenance are the immediate results of COCKPIT4's simplicity. Moreover, shorter learning curves and deployment cycles help reduce the TCO and improve the bottom line.

COCKPIT4i: COCKPIT for Internet – The internet is powerful working tool, but it can sometimes be a hostile territory where organizations are exposed to risks and threats. Jetro COCKPIT-for-Internet, COCKPIT4i – now part of COCKPIT - is a highly secured organizational web browsing solution. Unlike conventional secure web browsing methods that act as “gate keepers” and attempt to screen content and prevent malicious code from penetrating the corporate network, COCKPIT2i browses the web from a DMZ outside the corporate network. Thus COCKPIT4i prevents all Internet content from entering the corporate network. Instead, COCKPIT4i virtualizes the content by presenting it as a stream of video. This is completely transparent to the user – maintaining high-quality user experience – while ensuring 100% network protection.



FEATURES AND BENEFITS

COCKPIT has many new and improved features and benefits that largely can be divided into these seven categories:

- User Experience
- Centralized Management (CONTROL, MONITORING and Reporting)
- Printing solution
- Secure Web Browsing
- Portable USB Client
- Architecture and Infrastructure
- Scalability

USER EXPERIENCE FEATURES AND BENEFITS

Jetro COCKPIT enhances the usability and performance of applications running on TS. Applications delivered from TS would have the same look and feel as local applications thus providing the user with superior experience. Main features and benefits include:

Seamless Applications - Enables applications running on TS to look and feel as if they are running locally

Seamless Windows - Enables applications full desktop, running on TS to look and feel as if it is running locally

Session Reconnect - Allows users to reconnect to their broken TS sessions without re-logout and without any loss of open files / work

Audio redirection and Playback - audio playback and audio redirection for media stream from TS to the client device

Connection maintenance - Automatically reconnects user sessions when the network connection is temporarily lost.

Pass-Through Authentication - Credentials used to logon to a local Windows machine are passed seamlessly to TS sessions. This simplifies the user's connection process.

Roaming User Support- Users can roam between devices, locations and networks across the enterprise, while the system keeps the state of their running sessions and applications intact. Display is automatically re-configured to the device configuration. Typical usage scenarios are: medical staff in hospitals, technicians, laboratory worker and librarians.



Session Continuity - In case of network disconnection, the application remains active in the window accepting keystrokes and mouse movement from the user. At the same time session re-connection takes place at the background. The user may not be aware that connectivity even lost.

Automatic Reconnection - Upon logon the system automatically re-connects users to their disconnected sessions. This enhances the user experience and minimizes orphan session in the TS.

Disconnect or Close all Applications - Allows the user to exit all running applications with one click - without having to perform this action for each individual application.

Server-to-client redirection of file types (File association) – this feature allows users to open locally saved documents or files while the associated application will be launched in the TS.

Enterprise Single Sign-on (SSO) – Users are obliged to remember many user names and passwords. SSO simplifies this by enabling a single logon (to the local machine). From this point onwards whenever logon to a system or an application is required, an automated background process takes place performing logon on behalf of the user.

Session Sharing - When a user launches an application on a TS, a session is been created between the server and the access device. However, when a second application is launched (on the same TS) the Session Sharing feature will make use of the existing open session and will not initiate a new one. Session Sharing reduces memory and CPU utilization on the TS and significantly shortens the respond time since the user is already logged-on.

Adobe Flash® Pausing – The flash optimizer limits the allocation of resources for running flash files on the TS. This helps to accelerate performance while browsing the web. System administrators can limit the time that flash-based content can run for first time, before it will be paused. (Competing solutions allow flash limitation by reducing the resolution. However, flash content continues to run continuously consuming the TS CPU resources. Jetro COCKPIT's flash optimizer allows defining how many seconds the flash content will be executed; users may replay the flash file.)

Automated Client Installation - An automated process detects the client's OS and configurations and automatically installs the appropriate software on the client machine.

High Color Support - Support for 32 bit color depth for applications running on TS.

Bookmarks - Provide users with the ability to create persistent bookmarks directly to their favorite applications.



Folders - Applications can be grouped within folders for easier organization.

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CENTRALIZED MANAGEMENT FEATURES AND BENEFITS

Single point of Administration - Jetro COCKPIT features a new management console for centralized administration. The new console is designed to consolidate all farm management related issues under one common platform. The Centralized Administration console manages the entire farm, servers, users, groups, permissions, applications, load balancing criteria, applications and content publishing. Access Policies (policies can be applied to sessions, specific username, group, server name, zone, or client name), and Priorities management (Priorities can be applied to policies depending on specific user definitions) are supported via the Jetro console.

Automatic Alerts – Important health check or failure events can trigger an alert sent via text message (SMS) or email to a pre defined contact list. The alerts are generated automatically under various “if/then” scenarios. The content of the alerts can be pre-configured. Automatic Alerts is a build-in COCKPIT capability and no additional 3rd party tools are required.

Health Monitoring – Monitors and reports regarding the ongoing server’s health and provides vital real-time information for critical server components. This includes: general TS health and status, usage and utilization. The system issues reports and alerts about system or component events as they happen. Administrator can define automatic action if a critical system event takes place – for example server restart

Support for Microsoft Operations Manager - Jetro COCKPIT is compatible with Microsoft System Center Operations Manager 2007 that provides integrated monitoring and alerting functions for Terminal Services.

Integration with Management Systems – Simple Network Management Protocol (SNMP) TRAPs can be sent to leading software management suites like: CA Unicenter TNG, IBM Tivoli NetView, and HP OpenView.

Applications Publishing – Enables publishing applications to Microsoft Active Directory (AD) based objects: Users, Groups, selected organizational unit (OU) or to the entire organizations



PRINTING SYSTEM FEATURES AND BENEFITS

Printing in SBC environment has always been a major issue. In this version Jetro COCKPIT presents a comprehensive printing system that addresses diverse network and local printing needs.

PDF Automatic Conversion - Unique and centrally managed capability; converts printing jobs to compressed Portable Document Format (PDF) and then redirects it to a mapped Printer, Print Terminal or Network Printer. Alternatively the PDF file may redirects to the user.

Prints jobs may also be converted to EMF or to a Native print driver assigned to specific printers or applications. This capability automatically converts print jobs to XPDF (at the server side) solving many printing issues during deployments. The PDF can be sent to printer, to the user machine or via Email.

Comprehensive Client Printer management

the following capabilities are designed to enable IT staff to better manage client-attached printers in TS scenarios

Auto-Creation – Automatically creates mapping of client-attached printers into the user's session. When connected to a TS application it makes printing to local attached no different than a local print execution.

Printer Session Isolation – makes sure that client-attached printers are dedicated to the user's session and are not available to any other user on the same server.

Inheritance of Printer Properties – Beyond displaying the default printer settings in an auto-created client printer, it provides the ability to inherit the existing printer settings. Users enjoy seamless experience when printing with local printers.

Universal Printing - This is a major improvement and key capability of Jetro COCKPIT4. By making use of Enhanced MetaFile (EMF) client-side printers are mapped to a user session without installing the printer driver on the server. PCL/Postscript is also supported for printing from non-Windows clients. Universal Printing creates single, lean and generic printer driver that fits to any client-side printer and properties such as page size, orientation, print resolution, and more on a universal printer. Universal Printing eliminates the constant headache associated with printers' driver management

Factor Printing – enables printing to a universal printer, and then fine-tunes the printing process through a local print dialog on the client side.

Secure PDF Printing – Printing PDF documents using the universal printing capability can be digitally signed for security



Duplex Printing - support duplex printing from a universal printer
Rasterization Control - Enables server-side rasterization of printouts for enhanced printing fidelity in a universal printing environment

Print Traffic Routing - Administrators can set policies in which print jobs can be routed to: Network Printers, Print Terminals, Client Printer or Print Server. This significantly reduces network traffic (especially WAN traffic) and required bandwidth while shortening printing time.

Prints Job Compression – Printing in Wide Area Networks (WAN) consumes a great deal of bandwidth and resources, especially when large documents need to be printed. Prints Job Compression improves the printing time and the overall network performance.

Virtual Printer – Virtual Printer makes use of the PDF compression and conversion functionality to transform print jobs to PDF files and then send them to the end user. User can view, save, read, send or print files with local rich-PDF print settings.

Default Printer Provisioning – limits the available client-side printers to default printer only.

Client Printer Provisioning - Policy based auto-creation printer (client-side) enables administrators to control which printers can be provisioned

Network Printer Provisioning- Enables users residing within a defined IP range to automatically associate with the network printing devices in that range. Network Printer Provisioning increases user productivity and reduces IT support burden.

Print Mapping -Allows an administrator to define a mapping of server printer drivers to use for given client printers

Fallback Print Driver - Provides a default printer driver when the required driver does not exist on the server or when a Universal Printing driver is not available.

Driver Compatibility Control - Administrators can manage a list of approved printers' drivers on the server for the use of client-side printers. In this way administrators control which drivers are available for the users and prevent unsafe drivers from being used.

Print Stream Compression - Pre-compression of print data, significantly improves compression ratio and overall efficiency of the printing system.

Thin Clients Printing – Thin clients devices that do not enable native installations of printer drivers are now supported by COCKPIT's Print Terminal solution. Print jobs are pushed to an independent machine where a Jetro Print Terminal agent is installed and processes the print jobs on behalf the thin client device.



SECURE WEB BROWSING FEATURES AND BENEFITS

Traditional internet browsing requires a direct HTTP link from the user's browser to the external website. This however, enables viruses, worms and malicious code to enter to the enterprise network. The available solutions on the market attempt to identify the malicious code at the corporate gateway, preventing it from crossing the corporate boundaries. As long as the threats are known this is a good practice, however, for new and unknown threats (Zero patients) this method provides insufficient protection.

Jetro COCKPIT has a Build-in Secure Web Browsing capability that provides an end-to-end enterprise secure web browsing solution. The solution includes a dedicated gateway located at the demilitarized zone (DMZ) where the browsing takes place, as well as a controller unit. The controller is responsible for central management, security, synchronization, and personalization of the remote DMZ gateway.

Server Based, Safe Web Browsing - The secure browser transfers the HTML and web content into a video-like format and streams it to the users. The network is not directly exposed to the Internet and therefore is 100% secured from external threats. Moreover HTTP and FTP ports (80, 443) are closed at the firewall meaning no active code travels through the network and no relevant ports are open to be exploited.

Seamless Web Access - Users enjoy a full, seamless browsing experience by using the very same Microsoft Internet Explorer (IE) and the same icon placed on the user desktop, start menu programs or dashboard. The system automatically recognizes whether the browsing target is an internal web application or an external web site. It then auto-switches accordingly between local or remote browsers. Both Browsers act as one and are they fully personalized and bi-directional synchronized (Cookies, favorites, history, user setting and links). URL Links in the virtual web browser are launched directly from emails, Office document, or any source on the user's client desktop.

Enterprise class Secure Web Browsing – COCKPIT provides build-in Secure Web Browsing capability and is fully integrated into the management console. As default Secure Web Browsing does not allow downloads or uploads of files, the user is requested to email them through the corporate secured mail system for screening.

Smart Links Firewall - Allow/deny access to web sites based on user name, client machine, and a time schedule.

Secure File Download - Secure File Download means that file cleansing and/ or laundering of files from a web site to the user's client desktop ensures protection against the unsolicited intrusion of malware.



Secure File Upload - Files Upload from the user's client desktop to a web site through a virtual browser, with protection against data leakage

Send2Me - Send email (also with Attachment) to myself via page loaded in a virtual browser, the email attachments support adding files from the client desktop to a virtual MS-Outlook

USB-KEY PORTABLE CLIENT FEATURES AND BENEFITS

Users away from their office desktop (at home, traveling, accessing from an internet café or those who have no corporate laptop) can gain access to the corporate working environment via unique COCKPIT extension, the **COCKPIT-On-Key™**. COCKPIT On Key is a secure solution that features all standard COCKPIT tools on a compact USB memory stick. It enables users to logon into their familiar enterprise environment from any PC connected to the internet. COCKPIT On Key provides superior user experience, no installation is required and the logon page appears instantly as the user insert the key to the host USB port. After positive identification and authentication (user name and password) users gain access to their enterprise working environment.

Easy to use and carry - COCKPIT On Key is friendly, seamless, portable and safe. It allows instant access to crucial data from virtually anywhere in the world. Creating USB Clients for existing COCKPIT domains does not require any additional licenses.

Security - COCKPIT On Key is integrated with PKI Devices allowing integration with PKI authentication devices for full blown user authentication and SAC Client on same device. Moreover COCKPIT On Key leaves no traces or records on the host PC.

Jetro's COCKPIT customers can create their own Keys, using COCKPIT On Key packaging software, which allows customizing, defining, and creating keys. Once the MASTER key is created a simple copy action to any USB Key device is all it takes to duplicates it as many time as needed.



ARCHITECTURE AND INFRASTRUCTURE - FEATURES AND BENEFITS

Jetro's COCKPIT innovative architecture stands out in the SBC world. It is the only two-layer architecture product that allows improved performance and user experience. Jetro's COCKPIT is a true enterprise class solution and - unlike other solutions - it is ready for large installations out of the box. Jetro's COCKPIT is provided with integrated Microsoft SQL Server Express database, an enterprise class printing solution, most powerful load balancing engine in the industry, rich reporting and monitoring capabilities, secure connector, universal connector, unique USB Key Packager, Smart Cards and PKI integration and other building blocks required for enterprise SBC deployment.

Two layer architecture - Two layer farm design means having a management server with a centralized database and TS for applications execution. Unlike other products in which the full blown software is installed on every TS, Jetro's COCKPIT farm requires only a small TS agent to be installed. The two layer architecture ensures that only the very minimum of the server resources is consumed to run the TS agent, leaving the maximum resources for application execution.

Multi Zone - Allows deployment in segmentation of the farm to several zones (OU, geographic area, country, etc.). Still, the entire farm is managed collectively under one management console and database.

Multi Farm - Allows deployment in several separate farms. The entire deployment is managed collectively under one management console and database.

Directory Services / Windows NT domains support – Integration with Microsoft Directory Services (AD) and Windows NT domains to enable role-based access.

Novell eDirectory Support - Integration with Novell eDirectory to enable role-based access

Applications Secure Access – Secure access to applications utilizing SSL/TLS encryption tunnel and multifactor authentication.

Network Access Protection (NAP) – Supports NAP to allow network administrators to define granular levels of network access based on a client profile, the groups to which the client belongs, and the degree to which that client is compliant with corporate governance policy.

Complex Installations Servers – Enables multiple servers to be grouped together as a logical farm, regardless of the application they are running and OS platform.



Advanced Applications publishing – Allows distribution of applications among servers and farms. Applications can be published from all servers or any subset of servers.

Unified Application Delivery - Applications can be delivered to the users from diver's platforms like Windows TS Servers, HP-UX, IBM AIX, or Solaris, the user view those applications in a single view within the Jetro COCKPIT Application Panel

64-bit OS Platform Support - Supports 64-bit OS platforms as TS applications servers and client-side desktops machines

Multi-core Support - Supports multi-core processors, utilizing 64-bit technology based platforms for server virtualization



SCALABILITY FEATURES AND BENEFITS

Jetro Cockpit is a scalable SBC solution, and is largely deployed by customers from all over the world and from every industry sector. Some of Jetro customers make use of COCKPIT globally using the multi zone and multi farm capabilities. These customers utilize hundreds of TS and thousands of concurrent users.

Built-in Database - Jetro's COCKPIT is provided with integrated Microsoft SQL Server Express database.

Redundancy And High Availability – In a mission critical environment COCKPIT can be deployed in a redundant setup where management Server and database are redundant to ensure the access to applications is available.

Comprehensive Server Configuration- Provides administrators the ability to centrally configure application access to a subset of their servers

Zone Failover - Allow zones within the farm to function as a disaster recovery sites. In case where one of the zones is not available, one of remaining zones takes over and keeps providing applications access and business continuity.

Application Scheduling – Allows applications usage based on time and time of a day

Enterprise Class Scalability - Supports for large server farm deployments, spanning in wide area networks while maintaining SLA, performance and reliability.

Server Load Management – Monitors user sessions across a group of load-managed servers, based on configurable parameters like session count, application usage, CPU utilization, memory consumption, concurrent logons, IP ranges, time intervals, and more.

CPU Utilization Management - In a TS environment, one user's activities can affects the performance of other users. CPU management ensures that intensive processes initiated by one user do not degrade the overall performance of other sessions.



JETRO COCKPIT AS A FOUNDATION FOR SOFTWARE AS A SERVICE (SaaS)

INTRODUCTION

In the last few years many organizations tend to outsource non-core competencies and activities and to focus on what they do best. In light of this trend, the Software as a Service (SaaS) model has emerged. SaaS basically means the deployment of applications as a centrally hosted service accessible over the Internet. The SaaS as a concept is not new and during the late 1990s it was already known as Application Service Providers (ASPs). However these applications were built as single-tenant applications, with limited capability to share data with other applications.

SaaS applications are centralized and usually work through a multi-tenant architecture. Multitenancy means having a single instance of an application running, on the SaaS vendor's servers, providing applications services to multiple organizations (tenants). Those applications represent a virtual copy rather than physical instance of software and hardware. Licensing in SaaS model is one in which customers pay an ongoing fee to use the application, rather than one-time licensing fee. SaaS offers some benefits over locally installed and managed applications:

- Significantly inexpensive implementation cost since the SaaS vendor purchase and operates the application, hardware, infrastructure and the ongoing maintenance. The user accesses the applications over the web.
- Application becomes “variable cost” instead of fixed costs (initial purchasing cost + ongoing maintenance)
- Reduced OS, applications and hardware maintenance costs.
- Reduced IT staff.
- Pay per-use, subscription or per user, no need to purchase a license for every device
- SaaS vendors’ staff is experience and expert in the applications they host
- SaaS vendor’s service level agreement guarantees a certain level of service,



COCKPIT – SaaS READY

Jetro COCKPIT is an excellent foundation for vendors who wish to provide access to application in a SaaS model, or for organizations that would like to share applications infrastructure among, OUs or daughter companies. Jetro COCKPIT records, stores and analyzes just about any activity going on the system, using the built-in Microsoft SQL Server. This enables billing infrastructure, so vendors and organizations can issue periodically billing statement based on; actual usage, storage space, numbers of users, numbers of applications in use, subscriptions fee or pay as you go. The delegation and reporting capabilities within COCKPIT enable SaaS vendor to grant their tenants (customers) with certain control over their instance like; user and applications management, usage criteria, permissions, security setting and tracking reports . For SaaS vendors issuing accurate, in a timely manner, periodically billing statement is crucial. The rich reporting faculty is extremely important complementary tool, since this is the heart of the SaaS vendor's business model.

COCKPIT represents new level of enterprise software, its rich features set and capabilities, ease of deployment, intuitive management and the simple ongoing maintenances contribute to the immediate bottom line. Beyond that Jetro COCKPIT enables savings through a competitive initial price, licensing model and the ongoing ownership costs.

ABOUT RDT-JETRO

RDT-Jetro Ltd. is a leading server-based application virtualization solutions provider. Jetro's advanced software enables corporations to benefit from a centralized, secure delivery of applications across the entire organization. Through its leading COCKPIT™ and COCKPIT4i product lines, Jetro has established itself at the forefront of the IT industry, serving thousands of customers in the multibillion dollar Server Based Computing (SBC) and Network Security markets. RDT-Jetro Ltd. is fully owned by the RDT group, one of the leading Israeli technology providers since 1963.

For more information about Jetro and its products,

Please visit: <http://www.jetroplatforms.com>

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