



COCKPIT[™]
Enterprise, Server-based Computing

Jetro Cockpit 3.6
vs. Citrix[™] MPS 4

September 2005

www.jetroplatforms.com

Jetro Platforms is a leading enterprise software developer of server-based computing solutions.

Jetro Platforms' solutions enable rapid and easy deployment, as well as simplified integration into existing network environments and provide a simple way to slash costs of enterprise IT, improve security, provide remote access, and ensure business continuity.

The company's Jetro COCKPIT™ product family offers a comprehensive set of features, including multi-protocol support for work in mixed environments (ICA®, RDP®, HTTP and local), comprehensive Load Balancing, Secure Remote Access, an Advanced Printing Solution, Monitoring, Reporting, and a Seamless User Experience.

Jetro Cockpit™ is available worldwide exclusively through a network of expert server-based computing solution providers.



Copyright © 2005 Jetro Platforms Ltd. All rights reserved.

The information in this document represents the current view of Jetro Platforms on the issues discussed as of the date of publication. Because Jetro Platforms Ltd. must respond to changing market conditions, this information should not be interpreted to be a commitment on the part of Jetro Platforms. Jetro Platforms cannot guarantee the accuracy of any information presented after the date of publication.

This document is for information purposes only. JETRO PLATFORMS MAKES NO WARRANTIES, EXPRESS OR IMPLIED, IN THIS DOCUMENT.

Jetro Platforms may have patents, patent applications, trademark, copyright or other intellectual property rights covering the subject matter of this document. Except as expressly provided in any written license agreement from Jetro Platforms, the furnishing of this document does not give you any license to these patents, trademarks, copyrights or other intellectual property.

Jetro Platforms, Jetro Cockpit™, DirectLINK™ and INA are either trademarks or registered trademarks of Jetro Platforms Ltd. in the United States and/or other countries.

The names of actual companies and products mentioned in this document may be the trademarks of their respective owners.

Introduction

This document compares the architectural differences between the two leading Server Based Computing solutions: Jetro Platforms' CockpIT Enterprise version 3.6 and Citrix's MetaFrame Presentation Server 4 (MPS 4).

The five topics compared are:

- **Performance**
- **Effectiveness**
- **Reliability**
- **Complexity**
- **Pricing**

For more information:

- Visit Jetro Platforms at: www.jetroplatforms.com
- Send a support request form : www.jetroplatforms.com/support
- E-mail: info@jetroplatforms.com
- Or call: +1-800-639-5516

Table of Contents

INTRODUCTION	1
PERFORMANCE	3
CITRIX MPS™ 4:	3
COCKPIT™ ENTERPRISE 3.6:	3
EFFECTIVENESS	5
CITRIX MPS™ 4:	5
COCKPIT™ ENTERPRISE 3.6:	5
RELIABILITY:	7
CITRIX MPS™ 4:	7
COCKPIT™ ENTERPRISE 3.6:	8
COMPLEXITY	9
CITRIX MPS™ 4:	9
COCKPIT™ ENTERPRISE 3.6:	10
PRICING	12
CITRIX MPS™ 4:	12
COCKPIT™ 3.6:	12
CONCLUSION	14
LEGAL NOTICE	15

Performance

Using CockpIT 3.6 enables organizations to connect more users to each Terminal Server because, compared to Citrix, CockpIT produces less overhead on the Terminal Servers' hardware resources.

CITRIX MPS™ 4:

The complexity of Citrix's MPS 4's architecture produces unnecessary overhead on the Terminal Servers' hardware resources. Instead of having the Terminal Server focusing on application execution, it has to run Citrix's various subsystems.

In addition, instead of using native operating system features such as RDP protocol, shadowing capabilities, etc. Citrix developed its own mechanism that runs side by side with the operating system's features and produces extra overhead.

CockpIT™ Enterprise 3.6:

In a CockpIT farm, one or more of the central servers named CockpIT Servers provide for user requests. The CockpIT servers retain all configuration and licensing information, as well as dynamic data about the Terminal Servers in the farm. The Terminal Server runs a thin agent whose only function is to report dynamic data to the CockpIT servers. This architecture enables the Terminal Server to focus on its main duty – running user applications.

Due to the minor load that CockpIT's Terminal Server Agent produces on the Terminal Server's hardware resources, significantly more users can work on any given server compared to Citrix.

In a test conducted by Network Computing magazine in February 2005, testers were able to run 50% more users per server with CockpIT than with Citrix.

This table (taken from Network Computing magazine's website¹) shows the results of a stress test of 5 SBC products.

Remote-Display Servers Performance

	Citrix MetaFrame Presentation Server 3.0		Graphon Go-Global for Windows 3.0		Jetro Platforms Cockpit 3.5		NeTraverse Win4Lin Terminal Server 3.0		Tarantella Secure Global Desktop TSE 2.1	
	Percent memory	Percent CPU	Percent memory	Percent CPU	Percent memory	Percent CPU	Percent memory	Percent CPU	Percent memory	Percent CPU
Memory and CPU usage										
0 Clients	8	1	5	1	8	1	33	1	8	1
10 Clients	22	34	38	42	31	34	34	51	14	48
20 Clients	36	85	44	88	40	72	42	93	28	73
30 Clients	48	99	N/A	N/A	50	82	N/A	N/A	42	95
Responsiveness										
0 Clients	Normal		Normal		Normal		Normal		Normal	
10 Clients	Normal		Normal		Normal		Normal		Normal	
20 Clients	Tolerable		Tolerable		Tolerable		Poor		Tolerable	
30 Clients	Poor		No test		Tolerable		No test		Poor	

“Jetro Cockpit impressed us by handling 30 clients [in one server] running our text mix with tolerable performance. In contrast, rival products [including Citrix] either rolled over under a 30-client load or showed response times in the "poor" category, defined as "too slow to be useful.”

Michael Fudge, Network Computing (February 2005).

¹ <http://i.cmpnet.com/nc/1602/graphics/1602f3a.gif>

Effectiveness

CockpIT introduces the most effective load balancing solution in server-based computing. It supports hundreds of performance counters and other unique features. CockpIT enables the administrator to match the ultimate load balancing policy for the organization's needs.

CITRIX MPS™ 4:

Citrix load balancing mechanism consists of 12 counters of which only nine are performance related. These counters include only standard counters such as CPU load, Page/Sec, I/O etc. Each server calculates its load information and passes it to the Data Collector. Due to the large amount of data that is transferred on each update process, the default interval for updates is 15 seconds.

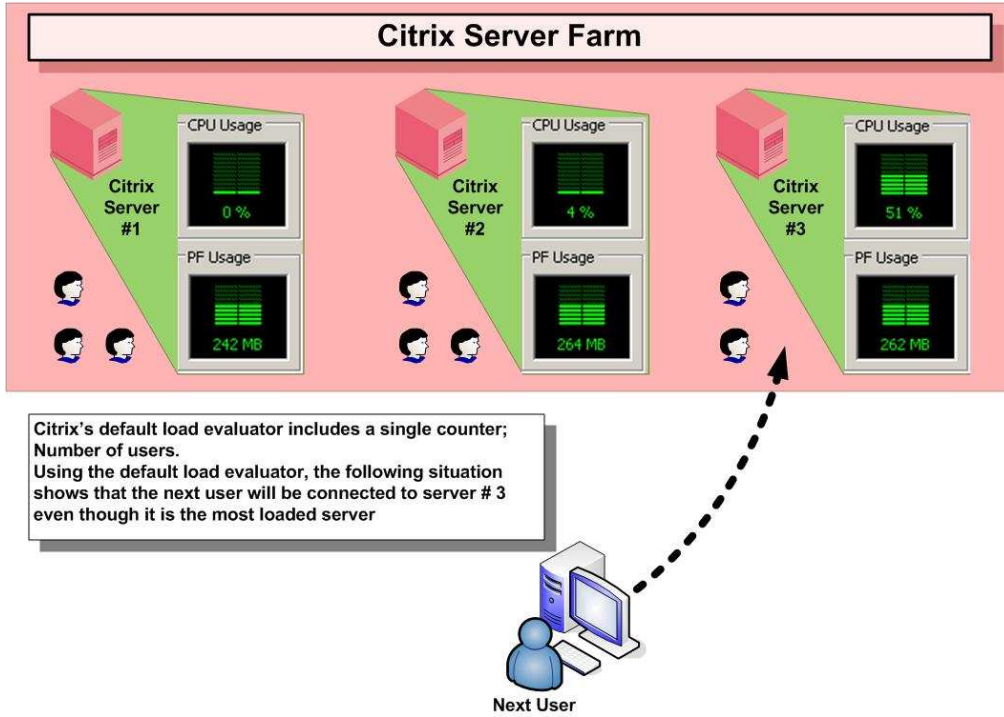
CockpIT™ Enterprise 3.6:

CockpIT's Load Balancing Mechanism is founded on Windows Server Performance Counters technology. This means that the system administrator can rely on any one of hundreds of performance counters available.

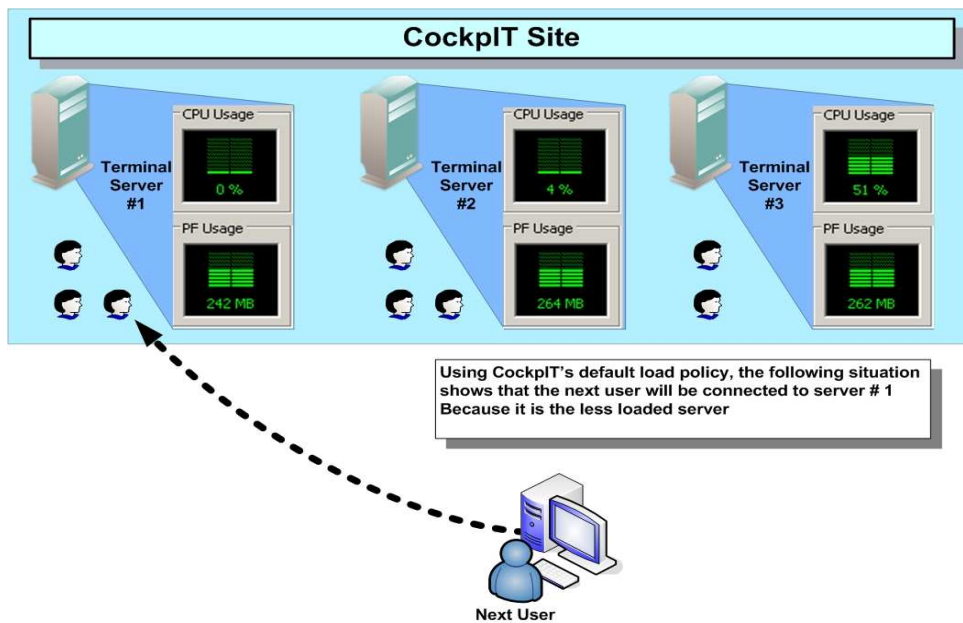
The CockpIT Terminal Server Agent calculates the load information by averaging historical measurements of a customizable depth. In addition, each counter can be given a certain value that controls the weight that it has on the overall load factor.

Due to the small amount of data that is transferred on each update, the default load policy report interval is as low as five seconds. This mechanism introduces a far more accurate load measurement and therefore takes better advantages of the Terminal Server's hardware.

This diagram illustrates the load balance process of a Citrix farm using the default Load Evaluator:



This diagram illustrates the load balance process of a CockpitIT farm using the default load policy:



Reliability:

CockpIT is a highly reliable solution. It provides built-in clustering capabilities of its core components. CITRIX MPS 4 does not include clustering capabilities of its database and its licensing services, and therefore, has a single point of failure.

CITRIX MPS™ 4:

CITRIX MPS 4's main database, Data Store, is a crucial component for the correct operation of the Citrix farm. If the Data Store fails, system administrators cannot perform any administrative task.

CITRIX MPS 4 licensing information is saved on a single server named License Server. If the License Server is not available for a period of 96 hours², the farm will stop operating and users will not be able to run applications.

In their Advanced Concepts Guide, Citrix states that enterprise customers should use Microsoft Clustering Services (MCS) on a SAN environment in order to cluster the data base³.

This solution requires expensive hardware resources such as shared storage device, fiber switches and fiber NICs, enterprise operating system licenses for both servers, enterprise class database software (such as Oracle™ or SQL™), and an advanced level of expertise to implement and support.

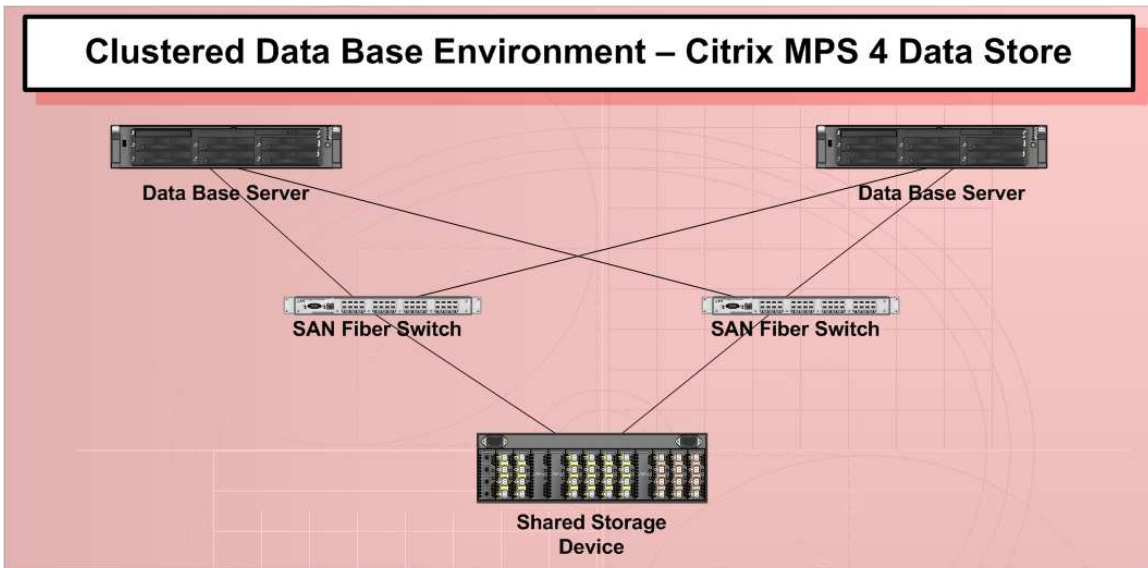
² This grace period was extended to 30 days for all licenses purchased after August 19, 2005.

³ Citrix™ *Advanced Concepts Guide*, "Cluster Failover Support", page 40.

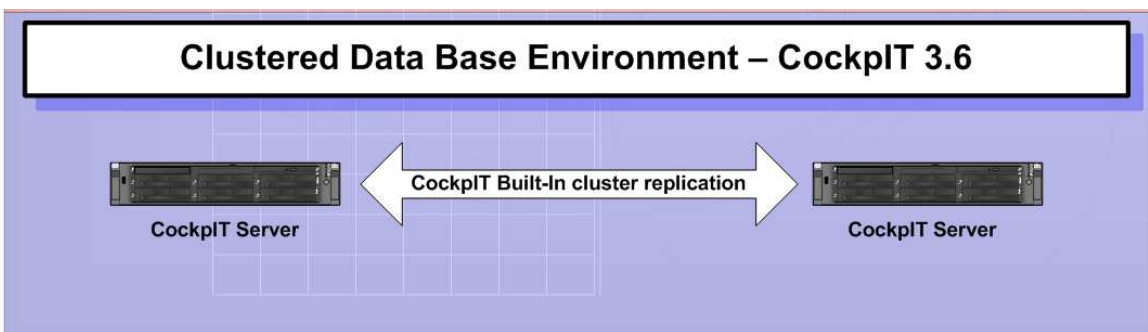
CockpIT™ Enterprise 3.6:

The main CockpIT Database resides on each CockpIT server and is replicated among all CockpIT servers using MSMQ technology. No external storage device is needed because CockpIT 3.6 has a built in cluster capability.

This diagram illustrates the structure and devices that are needed for a clustered database environment of Citrix's MPS 4 Data Store:



This diagram illustrates a clustered CockpIT database environment:



Complexity

The simplicity of CockpIT architecture results in quicker implementation and easier maintenance.

CITRIX MPS™ 4:

In a Citrix farm, every Citrix server contains a code that allows it to serve each client's request. To achieve this goal, each Citrix server has to know about all other servers in the farm. This functionality is implemented in a set of services named Subsystems, which run on each server. Due to the complicated architecture, users must have extensive knowledge of and expertise in CITRIX MPS 4, in order to understand, install, configure, support and maintain a Citrix farm.

The following lists some of Citrix's MPS 4 principles:

- Farm configuration information is stored on the main database named Data Store. This Data Store information is typically saved on external database software such as MSSQL/Oracle/DB2 which requires DBA expertise to support and maintain.
- Each Citrix server contacts the Data Store and retrieves relevant information. The information, named Local Host Cache, is locally stored in an MDB file.
- Each physical location or Zone is configured with a main server named Data Collector. The duty of the Data Collector can be dynamically transferred from one Citrix server to another during a process named Zone Data Collector Election. During this process, each Citrix server broadcasts information that is used by the other servers to determine which server should become the Zone Data Collector.

- The Data Collector is responsible for collecting dynamic information from its local zone Citrix servers. Each Citrix server is therefore constantly reporting its load factor, license consuming information, session count and other dynamic information to its local Zone Data Collector.
- Each Zone Data Collector exchanges data with all other Zone Data Collectors to copy each Citrix server state to every other Citrix server.
- Licensing information is saved on a central server named Citrix License Server. In every client connection event, the Citrix server contacts the license server to retrieve a concurrent license.

CockpIT™ Enterprise 3.6:

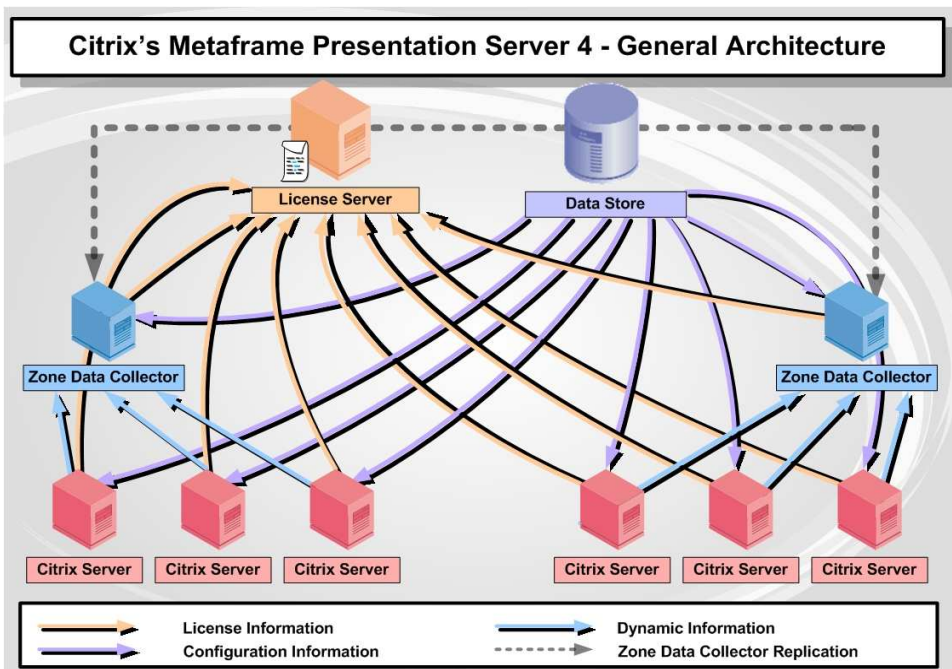
A CockpIT site typically includes one or more central CockpIT servers which serve user requests. The Terminal Servers report their load information to the CockpIT server.

When the CockpIT client is launched, it sends a request to the main CockpIT server which responds with the best available Terminal Server. The client then initiates a seamless RDP session on the Terminal Server which shows the application set of the logged on user.

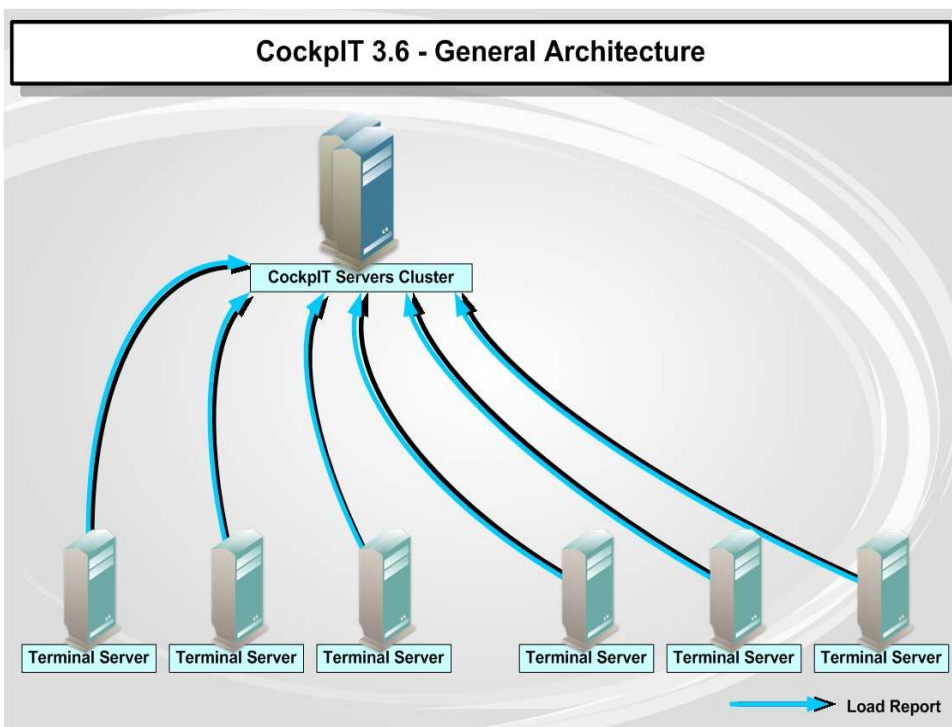
CockpIT 3.6 architecture is based on the following principles:

- All farm information such as licensing and configuration is saved on one or more CockpIT servers which replicate the data among them using a built-in clustering engine.
- Each Terminal Server reports its load to the CockpIT servers on a pre-configured interval.
- When the client is executed, the CockpIT server informs the client with the most available Terminal Server. The client then opens a seamless RDP session on this server. The application set is then displayed within the seamless RDP session.
- Upon the opening of the sessions and whenever the user refreshes the application set, a query is sent from the Terminal Server to the CockpIT servers.

- This diagram illustrates the general architecture of CITRIX MPS 4:



This diagram illustrates the general architecture of CockpIT 3.6:



Pricing

Jetro Platforms understands an organization's need for a quick ROI. As such, CockpIT prices are fair, reasonable and affordable.

CITRIX MPS™ 4:

Base License:

Citrix has several different pricing levels. Depending on included features, Citrix licenses range between €220 for each concurrent user in a single server environment, and up to €400 for concurrent users, for its enterprise license.

Subscription:

In order to be able to install product updates, Citrix's subscriptions cost €40 - € 50 annually per license.

Training:

Citrix has several courses for MPS 4. The Citrix Administrator course lasts five days and costs €980. The Citrix Enterprise Administrator requires four courses. Each lasts two to three days and costs €490.

Support:

Citrix support agreement ranges between €6100 and €9000 a year. The price is dependant on the Support Level Agreement (SLA).

CockpIT™ 3.6:

Base License:

Jetro Platforms' CockpIT's license price is €160 per concurrent user for all features. This price includes first year subscription.

For existing Citrix user licenses, Jetro Platforms offers a competitive upgrade path for €40 per concurrent user. This also includes subscription for the first year.

Subscription:

Jetro CockpIT second year subscription costs €24 pæ license.

Training:

Jetro CockpIT’s two-day Enterprise Administration Course costs €530.

Support:

Jetro CockpIT support costs between €1,200 up to €6,300 annually, depending on the SLA (Support Level Agreement).

The following table summarizes the price differences:

Product	Base License	Competitive License	Annual Subscription	Training	Annual Support
CITRIX MPS 4	220 - 400	N/A	40 - 50	980 – 2,000	6,100 – 49,000
CockpIT 3.6	160	40	24	530	1,200 – 16,300
Savings	80 – 240	N/A	16 – 26	450 – 1,470	4,900 – 32,700

All prices are in Euros.

This table shows that a CockpIT-based SBC enterprise class solutions costs €212,660 over a period of three years. A similar Citrix-based solution for 1,000 users costs €572,300 over the same period.

Conclusion

CockpIT's unique architecture is more cost effective and offers much lower TCO than Citrix. CockpIT features:

- Better hardware resources utilization
- In tests conducted by third party testers, CockpIT saved up to 30% of the total number of terminal servers in the SBC farm.
- No need for third party clustering solutions.
- No need for third party database software.

Shorter Implementation time.

- Simple installation and configuration.
- Powerful, intuitive web administration console that can be securely accessed from anywhere. No client installation is required.
- Native active directory integration which includes support for application assignment per Organization Unit, groups and users.
- Active X based client that seamlessly integrates into the user's environment.
- Advanced solutions such as CockpIT™ Secure Connector, print terminal, etc. are easily configured.

Training

- Shorter learning curve.
- Courses and certifications for all levels (Administrator, Engineer) are short and inexpensive.

Maintenance and Support

- CockpIT's straightforward architecture results in simpler maintenance.
- Only two database servers are needed for the redundancy of an entire terminal server farm.
- No external database maintenance is required.

Legal Notice

The information in this publication is subject to change without notice.

This publication is provided “as is” without warranties of any kind, express or implied, including any warranties of merchantability, fitness for a particular purpose or non-infringement. Jetro platforms™ (“Jetro”), shall not be liable for technical or editorial errors or omissions contained herein, nor for direct, incidental, consequential or any other damages resulting from the furnishing, performance, or use of this publication, even if Jetro has been advised of the possibility of such damages in advance.

This publication contains information protected by copyright. Except for internal distribution, no part of this publication may be photocopied or reproduced in any form without prior written consent from Jetro.

Jetro Cockpit™ is a registered trademark of Jetro Platforms™.

Windows™, MCS™, Microsoft™, SQL™, MSSQL™, Terminal Server™, RDP™, Windows Server™, Performance Monitor™ are registered trademarks of Microsoft™ Corp.

Citrix™, MetaFrame™, Presentation Server™, MPS™, Data Store™, ICA™, Data Collector™, Zone Data Collector™, Load Evaluator™, Citrix Server™, XPa™, XPs™ and XPe™ are registered trademarks of Citrix™ Corp.

All other trademarks and registered trademarks are the property of their respective owners.

Visit the Jetro Platforms website for downloads,
product updates and on-line support.

www.jetroplatforms.com

COCKPIT™

Enterprise, Server-based Computing

Jetro Cockpit™ is a Server-based enterprise suite that manages end-user access, secures data and deploys applications from one or more Microsoft Terminal Servers and/or Citrix Servers. With Cockpit™, system administrators can oversee an entire Server-based Computing environment including local, remote, Web-based and Server-based applications.

JETRO®
P L A T F O R M S

International support #
+1-800-639-5516

Copyright 2001-2005 Jetro Platforms Ltd. All rights reserved.

Cockpit is a registered trademark of Jetro Platforms Ltd.
Microsoft, Terminal Server, Active Directory, NT, Windows, Start Menu, and Domain
are registered trademarks of Microsoft Corporation.
Citrix & ICA are registered trademarks of Citrix Systems, Inc.