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Internal: 719-00255A
Release date: 01 January 2004

White paper

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ServiceWire

Vision

The ServiceWire vision is to develop and implement a secure, primarily broadband-based remote support solution. The ServiceWire project is a global Creo support initiative with the ultimate goal of supporting our install base more effectively. ServiceWire provides a versatile, robust connectivity solution along with diagnosis tools for on-demand remote support by Creo engineers.

Evolution

Yesterday

The ServiceWire project originated as a grassroots attempt to alleviate the problems associated with the complexities of remote support connectivity. We developed an application that largely automated the process of remote connectivity via analog dial-up. The application also provided a centralized platform for a large number of service tools that simplified the troubleshooting process.

It was soon realized that the solution would have to provide broadband connectivity to be successful as a global connectivity platform. Successful testing in Europe and North America confirmed that ServiceWire is a global solution.

Today

The Creo-wide rollout of ServiceWire is currently underway. By the end of 2004, all Creo Solutions Centers will be equipped with the infrastructure that allows remote support engineers to seamlessly connect to a customer site and troubleshoot problems.

Today, we have the technology to harness global Creo expertise and react to a customer problem from any Creo Solution Centre to anywhere in the world.

Tomorrow

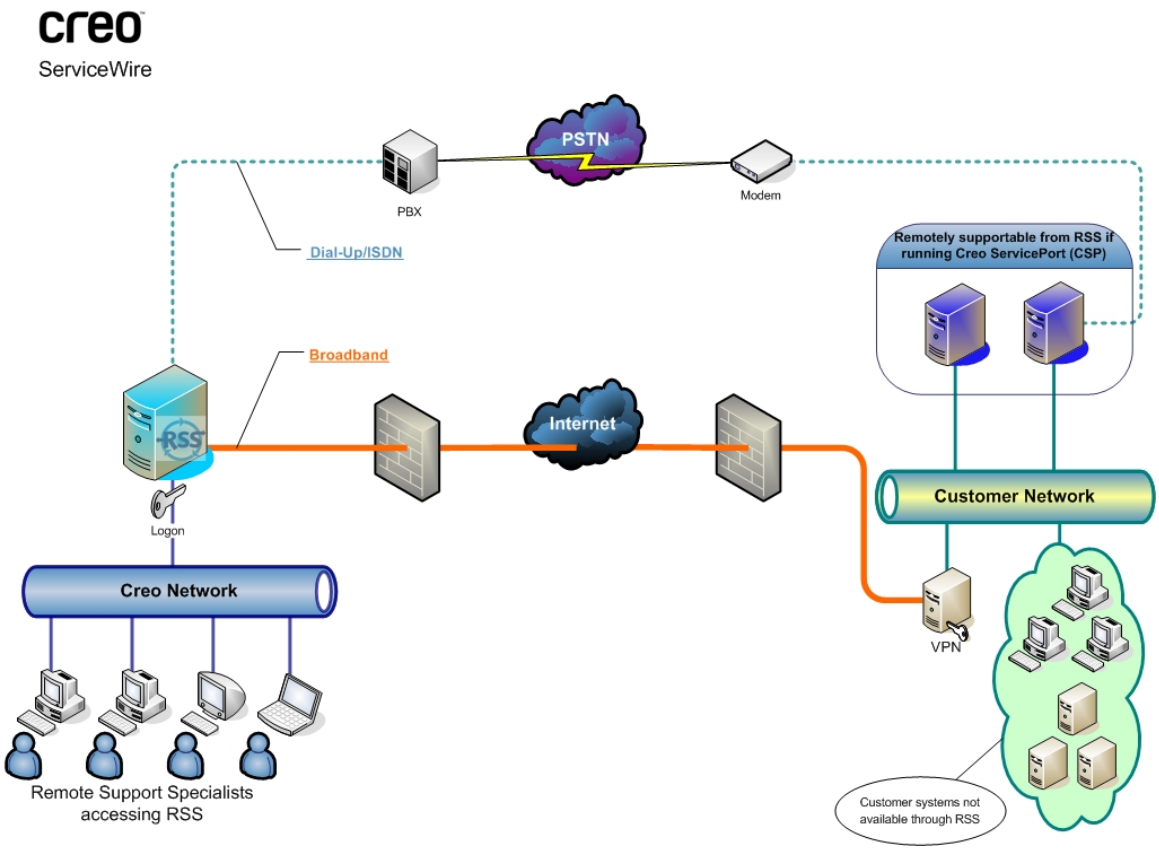
The future holds a major shift towards a proactive support model at all levels in order to minimize customer downtime. The ServiceWire system will facilitate the call-home technology that will allow our products to report

problems automatically, possibly even before they occur. ServiceWire will also provided automated checks during a connection establishment to provide engineers with the real-time system state.

To proactively affect our partners' business, we will need both the real-time and the historical views of the Creo infrastructure on the remote site. The ability to "foresee" a problem is largely based on ServiceWire's ability to capture historical data over time.

ServiceWire System Architecture

ServiceWire consists of two main components, Remote Support Server (RSS) and Creo ServicePort (CSP). RSS manages the connectivity to customer sites from Creo Solutions Centers. It uses CSP—remote agent software installed on supported equipment—to diagnose and aid in accessing the equipment. The bridge between these components is the remote connectivity that the customer chooses.



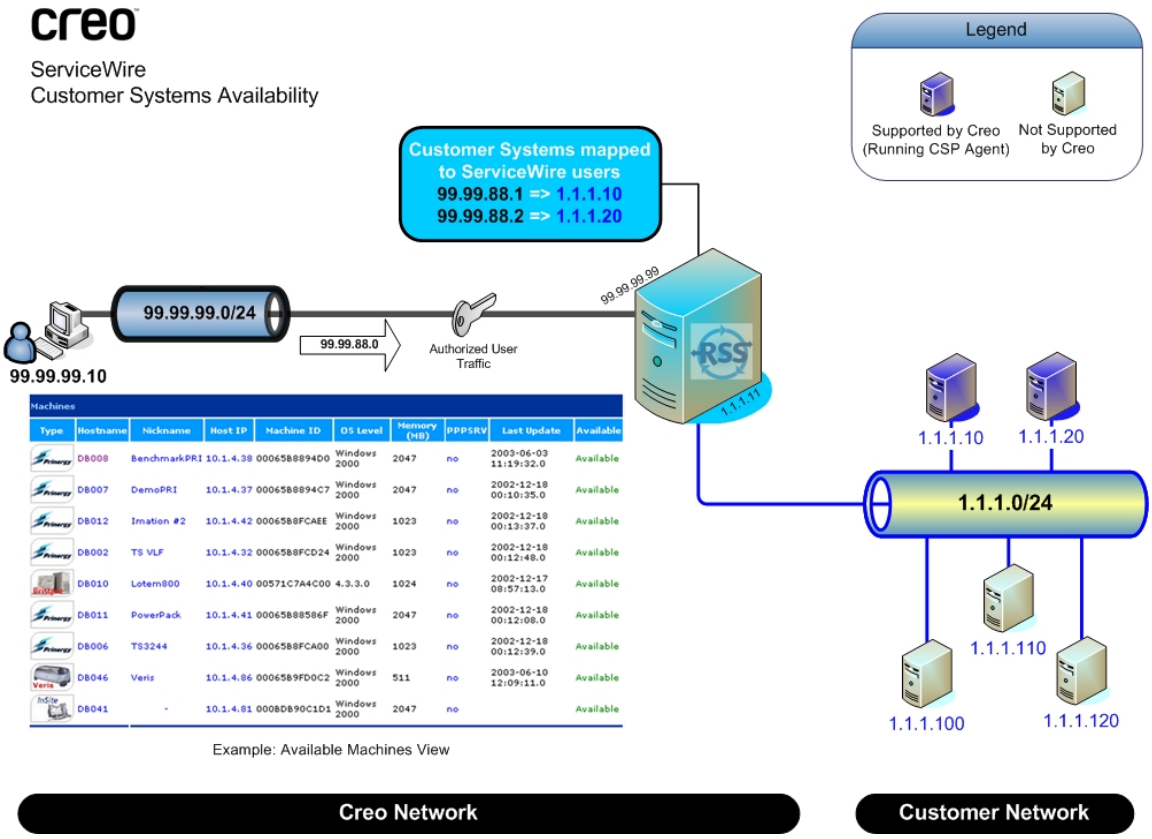
Remote Support Server (RSS)

RSS is a Web-based application used by Creo support engineers for supporting equipment remotely. It provides diagnostic tools, connectivity management, per-site equipment information, automated support tasks, and basic support management features. The application is developed to support PC and Macintosh® users.

When the Creo support engineer provides remote support, they authenticate to the desired RSS on the Creo network, select the customer, establish the remote connection, and proceed to correct the problem.

Connection Management

When a request to connect to a remote site is made, RSS is responsible for establishing the connection based on the connectivity configuration information. The connectivity configuration is centralized, which means the most up-to-date configuration is available to all RSS users. When a connection is established with a remote site, RSS will provide a network path (route) to only the Creo-supportable equipment configured in the database (see figure below). Other customer equipment is not available to Creo support engineers. This is accomplished in conjunction with CSP and the assignment of DNATs (Destination Network Address Translation). A dynamically assigned IP is mapped to each real IP of customer premise equipment found running CSP. RSS is only passing traffic destined for this equipment running CSP (see figure below). All network traffic between RSS and CSP is secure (authenticated and encrypted). Traffic outside of the CSP/RSS socket is secured by either the software tunnel or telecom carrier.



Machines

Type	Hostname	Nickname	Host IP	Machine ID	OS Level	Memory (MB)	PPPSRV	Last Update	Available
Primary	DB008	BenchmarkPRI	10.1.4.38	00065B8894D0	Windows 2000	2047	no	2003-06-03 11:19:32.0	Available
Primary	DB007	DemoPRI	10.1.4.37	00065B8894C7	Windows 2000	2047	no	2002-12-18 00:10:35.0	Available
Primary	DB012	Imation #2	10.1.4.42	00065B8FCAEE	Windows 2000	1023	no	2002-12-18 00:13:37.0	Available
Primary	DB002	TS VLF	10.1.4.32	00065B8FCD24	Windows 2000	1023	no	2002-12-18 00:12:48.0	Available
Backup	DB010	Lotem800	10.1.4.40	00571C7A4C00	4.3.3.0	1024	no	2002-12-17 08:57:13.0	Available
Primary	DB011	PowerPack	10.1.4.41	00065B88586F	Windows 2000	2047	no	2002-12-18 00:12:08.0	Available
Primary	DB006	TS3244	10.1.4.36	00065B8FCA00	Windows 2000	1023	no	2002-12-18 00:12:39.0	Available
Veris	DB046	Veris	10.1.4.86	00065B9FD0C2	Windows 2000	511	no	2003-06-10 12:09:11.0	Available
InSite	DB041	-	10.1.4.81	000BDB90C1D1	Windows 2000	2047	no		Available

Example: Available Machines View

Equipment Database

RSS maintains a database of the Creo-supportable equipment and connection information at each site. This enables a quick view of basic system configuration and networking information. Tracking these systems is in combination with CSP. The database stores the most accurate configuration information available since the last established remote connection.

Tools

Support tools and scripts are provided from within RSS, or the application may be used to launch Creo client applications or other third-party support tools. Such tools may include Windows® Terminal Services Client, pcAnywhere®, VNC, telnet clients, or any other tool that functions across a TCP/IP network. The tools from within the application work in conjunction with CSP. They primarily include scripts that are executed through CSP to provide fast diagnostic information.

Automated Support Tasks

RSS supports automated tasks that may be preconfigured by a Creo support engineer. Tasks currently include scheduled downloading of files generated by the client system, such as log files or reports.

Support Management Features

RSS provides features to keep track of support call information for each site. Reminders can be set up to e-mail users to check up on support calls. Connectivity contact information may be stored right in the system, alleviating the need to search the customer for the information technology contact. Pre- and post-connection alerts may be configured to inform support engineers of vital information before they connect or after they disconnect. System and debug logs are easily stored or e-mailed from within the application. Connection and activity audit logs are maintained, keeping track of all actions in RSS.

Creo ServicePort (CSP)

CSP is remote agent software installed on Creo-supportable equipment. CSP runs as a service and as such, it has no GUI. It was developed with flexibility in mind. Currently it's implemented on Windows systems and will soon be available for AIX. CSP works in conjunction with RSS to execute scripts for diagnostic purposes and to aid in tracking of systems and their configuration.

Self-Discovery and Tracking

To manage the tracking of Creo-supportable equipment, CSP uses a self-discovery technique. This technique uses a UDP multicast to discover other supportable systems running CSP on the network. If multicasts are blocked across subnets or hardware devices, self-discovery will fail and RSS will need to be manually updated. The communication between CSPs also uses Public Key Infrastructure (PKI) to ensure that an unauthorized user or application cannot mislead them.

Before a system can be added to the RSS database it must be running CSP and it must be contacted by RSS. Once this contact between the two is established over the connection, RSS updates the database with the

point-in-time system information reported by CSP. The remote system will then be available for support engineers as an available system.

Script Execution

Initiated from the RSS side, CSP has the capability of executing scripts stored locally on the remote system. The script results are then displayed to the support engineer from within the RSS application. When supportable Creo applications are installed or updated, scripts to assist in support may be installed. If an updated script is required on the remote host RSS will push the script to the host using CSP.

Self-Updating

As CSP matures it will require updating. This task was made easy by allowing RSS to update CSP if an out-of-date version of CSP is detected during the connection.

Security

CSP uses PKI for authentication along with a 1024-bit encrypted channel between RSS and CSP. It listens for RSS on TCP port 6503. It is required for Creo to support through RSS and may only communicate with RSS or another CSP.

Connectivity

The customer chooses the connectivity method that links RSS and CSP. Once the customer's side of the connection is configured, Creo will test the link. The connectivity method must enable all protocols and ports open in both directions. Once configured and tested by Creo and the customer, future connectivity is automated and managed by RSS as mentioned earlier.

ServiceWire supports multiple connectivity methods such as VPN (PPTP), dial-up, and ISDN. VPN (PPTP) is currently the only supported broadband connectivity method from ServiceWire—IPSec is in development. ServiceWire will use the customer's existing VPN infrastructure to connect to. Customers will supply Creo with the connection information.

Note: Sending passwords via e-mail is unsafe.

RSS is capable of making outbound connections only. All inbound connection attempts are dropped at the Creo firewall. For added security, Creo can provide the public IP addresses of our system if customers choose to filter IP traffic on edge routers or firewalls.

Dial-up/ISDN connectivity is accomplished by using a dedicated line to the remote site or another type of dial-up server. Creo recommends a single access point for remote support to allow for consistency.

ServiceWire is focusing mainly on broadband; however, it still continues to support legacy dial-up sites. Broadband configurations on the remote site are the responsibility of customer. Creo on-site engineers are not trained in setting up broadband or ISDN-type connections. For more information on setting up these connectivity methods, contact a ServiceWire representative through the Creo Response Centers.

Network Security

Features are developed into the system to ensure reliable and secure communications for both the customer and Creo. Remote support requires business partners to come to an agreement and understanding of acceptable and secure use. The ServiceWire system is primarily a network solution and, as such, it inevitably prompts questions related to network security.

RSS access is only given to Creo support engineers that are required to provide remote support. The system is only accessible from inside the Creo network. Creo support engineers use ServiceWire only for the purpose of diagnosing, supporting, and maintaining customer equipment with the consent of the customer. All ServiceWire users are required to authenticate before they are authorized to view customer information, connect to customers, or pass traffic through RSS to a remote site. Creo support engineers are presented with only the limited view of the remote site's network that is comprised just of supported Creo equipment. Support engineers are required to contact the customer before initiating communication via ServiceWire. All transactions initiated from RSS are logged. All traffic passing through RSS is captured and archived.

About Creo

Creo is a world leader in solutions for the graphic arts industry. Core product lines include image capture systems; inkjet proofers; thermal imaging devices for films, plates, and proofs; professional color and copydot scanning systems; workflow management software; and proofing and printing consumables. Creo is also an original equipment manufacture supplier of on-press imaging technology, components for digital presses, and color servers for high-speed, print-on-demand digital printers. Creo trades under the symbols CREO on NASDAQ and CRE on the Toronto Stock Exchange. www.creo.com

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