

WBMM Scope Proposal

Introduction

This document describes a proposal for the scope of the PWG Web Based Monitoring and Management (WBMM) working group. It provides a high-level description of the scope as well as supporting use cases.

Scope

The purpose of the WBMM activity should be to address the newly emerging requirements for management of printing and imaging devices and services. Current management protocols are designed for enterprise/LAN based management of devices and services. They will not, however, satisfy the emerging needs for management. This is driven by several factors:

1. printing and imaging solutions are becoming distributed applications that contain components that may be separated by a firewall
2. printing and imaging devices/services are being integrated with back-end services exposed through web sites.
3. devices contain increased functionality that requires more complicated representation and operations.
4. management of printing and imaging infrastructure and devices is getting outsourced to service providers

Background

The distributed nature of the new services centric printing and imaging solutions adds new requirements for communications, interoperability and functionality. These new services will be deployed across the Internet and thus will need to be able to traverse firewall boundaries. The supported communications protocols must be Internet friendly. They must also support both synchronous and asynchronous models. HTTP and SMTP are the current targets. Web Services protocols are becoming the defacto standard for interoperability between components of distributed solutions. These components will use WSDL, SOAP, XML and HTTP as the basis for their communications. In addition, clients will use these protocols to consume the services provided by the distributed solutions. To maintain consistency and interoperability there needs to be a comparable set of management-focused functionality built on these same protocols. The increased functionality of devices will require a new data model to describe them. This model needs to be web services compatible (i.e. XML based), extensible (can add new representations of functionality or state) and scalable (can be adopted from low-end devices to high-end services).

Use Cases

Management of Web Services Enabled Devices

Devices now support multiple access models, dynamic functionality and complex capabilities. This functionality is being exposed as a set of services that are accessed through Web Services based protocols. An example of this is the PSI. These protocols change the use model from a device centric to service centric view. Current management protocols (SNMP ...) are not well suited to represent or interact with this new functionality. The WBMM protocols need to support the direct interaction between a device and management application to support these new capabilities.

Scenario

A device that supports a web services based job submittal protocol is deployed at a customer's site. Buzz Lightyear invokes the client software that submits a job to the device via web services based protocols. The device-based printing service enters an error state due to a paper jam. It is unable to accept the job so it fails the client's request to initiate a job. An exception is sent back to the client. An event is sent to the management application that is monitoring the device and its services. Woody, the administrator, uses the management application to query the device/service to determine its state and to invoke corrective operations. Corrective operations may include sending a command via WBMM or an existing protocol, or having someone physically fix the device depending on the type of error. Events and state queries conform to the WBMM protocol.

Printing and Imaging Devices Integrated with Back-end Services

Management applications have traditionally consisted of a single application that is deployed at the location where the management operations are performed. Just like other types of applications, management applications are starting to be deployed as a set of distributed components. A common deployment scenario consists of some amount of basic functionality that is deployed locally on the site and enhanced or extended functionality is deployed in a remote location. This allows the extended functionality to be consolidated in a single web site. This enables a hybrid model that fits between the traditional self managed and service provider environments. The customer manages their devices but can take advantage of centralized functionality from an external provider. In this model, a management application or a device will extract a snapshot of its functionality, configuration and state and pass that information onto a back-end web site. The web site performs the processing and returns the result.

Scenario

Fred submits a job to a print service running on a device. After the job is submitted, an error occurs and the device enters an error state. Its status indicates that a service error, number xxx.xx, has occurred. Barney, the administrator, is notified of the error via an event that is sent to his management application. Barney uses the management application to attempt to determine the cause of the error by communicating with the device using WBMM, SNMP, or another existing protocol. The management application doesn't contain information concerning service error codes. It grabs a snapshot of the current device configuration and state, formats the data into a XML document that conforms to the WBMM standard XML device model (if device supports it directly then it acts primarily as a forwarding agent) and then forwards onto the support web site. The web site processes the information and then provides an explanation of the cause and the steps correct the error. The management application presents the data in its user interface. Barney follows the directions generated from the support site to correct the error.

Service Provider Based Management

Service providers are taking over more of the management responsibilities. Their solutions are normally deployed in a distributed manner. Devices and possibly some kind of local management application/proxy are deployed within the customer site, while the 'management console is maintained at the service provider site. Traditional management protocols such as SNMP are generally not allowed through the firewall due to security issues.

Scenario

W Coyote Inc has ten small sites that each has a single device. W Coyote has hired Acme, a service provider, to manage these devices. Included in the contract is a minimum guaranteed uptime of 90%. Acme is penalized when a device fails to maintain the contracted uptime. Since each site only includes a single device, it is cost prohibitive for Acme to install an application/appliance at the customer sites. They decide to directly monitor and manage the devices remotely using WBMM. The service provider's portal remotely monitors each device to determine its uptime and any errors. If an error does occur, Acme will either manage the device remotely to fix the error or contact someone at W Coyote to make the correction. At the end of the month, Acme provides a report on the uptime for each device to justify their charges. If there is, a disagreement Acme can provide a log obtained through a secure, authenticated connection of the monitoring activity.