Summary of WBMM Minutes
June 12, 2003

What is this:
What follows is a summary of the contents of the minutes of the WBMM meetings for January-June 2003. They are organized by category (scope, authentication, protocol, etc). The comments in each category are ordered sequentially, i.e., comments from earlier meetings appear before comments from later meetings.

Scope:

WBMM is concerned with device or service management. WBMM is **NOT** concerned with job management. (although there are marginal cases)

At this point, WBMM should **not** get into the specifics of general logging of information, setting printer policy, etc. since disparate practices and formats for such actions already exist. There may be the need for WBMM to support the communication of "opaque" files supporting such actions. It is possible that the WG may want to expand into such areas in the future with a dictionary of log-able items, a scheme for policy tied into the printer schema, etc.

WBMM goals now include definition of methods, operations and an XML based data model for device management. WBMM will extend the PWG semantic model and should be complimentary in terms of design and architecture with the PWG Print Services Interface. WBMM will address management of imaging related web services as well as devices.

Just as in PSI, with WBMM, a proxy implementation is feasible. A design goal should be not to make it hard to develop a proxy implementation.

FW Upgrade:

Supporting the update and/or versioning of executable code is a major objective and pressing objective of WBMM. The immediate approach would be to support either entire replacement or patching to the extent and in the way provided for by the devices being managed. That is, WBMM would not mandate how update was to be accomplished; rather it would allow the remote management station to supply data compatible and institute an update process compatible with the update mechanism implemented by the device or service.

Authentication/Policies:

WBMM may allow for but should not define the mechanism for managing authentication and authorization. If it is necessary to address this, WBMM should revert to currently being defined IETF rules in this area.

WBMM must allow for the local setting of policies that restrict remote access.

We need to facilitate administrative policies that may restrict various operations and access to locally-selected configuration parameters based on authentication.

We agreed that it is valid for WBMM to perform something akin to the Printer MIB "prtGeneralReset" although this might not always be possible or advisable through firewalls. That is, reset, like all reconfiguration operations, must be subject to local policies.

Security:

In discussing the scenarios, both encrypted and/or non-encrypted forms may be mandated in various environments. Needs further discussion.

General Requirements:

WBMM must do more than provide the uptime record. For a viable implementation, WBMM must support not only problem reporting but remote diagnostics, and if possible, remote repair, possibly by providing detailed instructions to customer personnel.
Field trips must be minimized if not eliminated, and those made must be fast and productive. (no going back to the shop for an unanticipated replacement part)

The supplier must be able to document down-time that was beyond its control.
If someone neglects to supply paper, shuts down power or abuses the equipment, an indisputable record of this (and the times it occurred) must be available.

The need to resolve disagreements with logged information suggests that the communicated information must be authenticated, secure and dated.

The stated requirement of having a log showing up-time presents several approaches, each offering different challenges:

- the equipment could communicate the value in a local up-time meter to the supplier– but would this be reliable and tamper proof?
- the equipment could communicate whenever it went down and then when it was up again. But can it communicate if it were shut down?
- there could be a periodic "watch-dog" type ping to the remote supplier when the unit is up

Events/Notifications:

We are not reinventing notification subscriptions but we will define the event packet. If the PWG needs a general event notification framework it should be addressed in PSI or as a separate working group. DHCP is one method for a device to find the event server to bind with.

Harry's RegisterRequest WSDL interface may be taken as a registration for notification. Ira maintained that notification is already well covered (presumably by the general alerts notification capability outgrowth of IPP) and did not need to be replicated. Ira suggested that periodic or date-time reports could be covered by referencing appropriate elements. Bill argued that IPP notification was too general, complicated and cumbersome on one hand, and did not provide the proper mechanism for moderation and conditioning on the other. It was conceived of for a different purpose and was not suitable as the major component of Web Based Monitoring. Indeed, Bill had argued that, following the principle of not overloading operations, there should be multiple operations distinguishing alerts from periodic and timed reports. These operations were to be distinct from general notification, and were not to identify a "listener" since setting up who receives reports should be governed buy policy at the managed device.

Services:

We need to describe the attributes of a WBMM service that could be used for directory-based discovery using LDAP (ex. For discovering a WBMM proxy)

We discussed the need for separate Service and Device object models (vs. a single model). PSI is relying on WBMM as its management protocol. While it is appropriate to model device and service management separately, there will be fuzzy areas that we encounter due to the fact that we have always dealt with the "printer" as an abstract (service) in protocols like IPP. We will need to deal with this effectively.

We need to document what sort of things will need to be managed in a service (ex. PSI) and we will have to carefully handle overlap where it occurs between service and device attributes.

Even with the recent addition of a "set" operation to PSI, a parallel management capability can be used to provide necessary support for setting up policies, accounting etc. Examples cited: PauseService, PurgePrintQueue, ResumeService, EnableService, DisableService.

Data Model:

Agreement - Will need to map Printer MIB (Fin MIB etc) to whatever model WBMM ends up with. We should separate the protocol and operational binding from data model….Open topic.

In reviewing the minutes of the last conference call, it was noted that we did not have consensus on the need for a new information model to replace MIBs. Building on the fact that there was agreement that whatever model WBMM ends up with must map to the existing Printer MIBs, Ira suggested that a mapping of the MIB objects into an XML structure, using the data types identified as part of the Semantic Model/PSI activity, would provide a good starting point. The discussion proceeded, addressing some aspects of the New Data Model Requirements subject.

Points made and agreed to were:

1. The WBMM model should follow the precedent of the SM/PSI model and schemas, but whereas the latter are job/document oriented, the WBMM should device/service oriented
2. All objects in the existing printer MIB (and associated MIBs) must be covered in any new modeling
3. The information model must be complete. Any corollary to the printer MIB dependencies on HR MIB objects (and presumably MIB-2 objects?) must be avoided.

Points that were **not** fully agreed to were:

1. How to structure the model so that information is grouped by use and application. The example of handing consumables utilization objects groups together was countered by observing that the same object could logically appear in several use groupings. The alternate way of addressing this is to provide multiple views of the same information. But then it was not clear if all likely views could be predetermined.
2. Although there was agreement that to recasting MIB information into an XML model would provide a good starting point, and that substantial new information would need to be added to cover things missed or newly created (such as services), there was softness on the amount of rework this starting point would require.

In developing WBMM schema, comments should be used to specify precise mappings, for example to the Printer MIB, where they exist. This will make it easy on the developer who needs to perform these mappings

WBMM should expand (beyond the Printer MIB) to address MFPs as these are now becoming prevalent.

A lot of discussion about the pro's and con's of choosing a verbatim Printer MIBv2 translation as the focal point and mandating (or not) devices that implement the Printer MIB to also expose this verbatim schema. Resolved as follows

a. A verbatim translation of Printer MIBv2 will be very useful in some environments, especially those based on SNMP centric enterprise management software.
b. However, the Printer MIB, as successful as it is, still suffers from some pitted interpretation resulting in interoperability issues. We'd like to IMPROVE this scenario with WBMM. This won't happen simply by mandating that WBMM in a device exactly reflect the native Printer MIB implementation. A key goal of WBMM will be a very high degree of "information quality".
c. A reduced set of mandatory elements should be described for WBMM. These can most readily be obtained by starting with the collection of mandatory SNMP attributes from all groups. Some optional attributes (such as the Input and Output "name") may also be included.
d. New groupings are sought for the resulting WBMM collection of elements. The PWG will attempt to optimize these groupings to accommodate the most likely usage scenarios. "Communities of Interest" will always be able to construct their own, specific, view relative to the data by specifying a schema specific to their domain.

We suggested, in mapping the Printer MIB to WBMM XML schema, that the lengthy Printer MIB descriptions be left out of the schema definition in favor of a reference to the Printer MIB, itself. For new elements in the schema which go not map to an existing reference, the PWG may decide whether to include the description or create a separate document to reference.

Discussed attribute / element grouping. Agreed there is some benefit to new groupings (ex. ID Group) and that elements (ex. MarkerLifeCount) may overlap into more than one group.

We discussed the need for separate Service and Device object models (vs. a single model). PSI is relying on WBMM as its management protocol. While it is appropriate to model device and service management separately, there will be fuzzy areas that we encounter due to the fact that we have always dealt with the "printer" as an abstract (service) in protocols like IPP. We will need to deal with this effectively.

We reviewed the data model diagram that Bill included in the minutes for last time. This brought up questions about what the differentiation between device and service elements, possible duplication and whether one was subservient to the other. There were also questions about whether the diagram addressed the desire for information to be ordered as consumed, a continuing issue. There were particular questions about how to handle MFDs, such as whether there is an "MFD service" or whether an MFD was a device that provided several basic services. Although it was contended that there was an MFD service, this was not intuitively clear and we agreed we need better modeling and expanded use cases around MFD. Indeed, it was pointed out that all the present scenarios deal with printing operations and that, if WBMM is to handle imaging functions in general, scenarios dealing with other imaging operations were necessary.

The issue about organization to facilitate consumption, not to reflect the physical structure brought both agreement and the need to stress that, since there will be several modes of consumption, there is the need for several organizations of the underlying information. Wording needs to be worked on. And it was unclear whether there are several models or one model with several structural variations.

Transport/Protocol:

Both intra and extra net operations are valid goals. But prefer not to have distinct protocols, operations.

HTTP over port 80: Question - IANA port for WBMM? Agreement - yes... but consider other bindings (SMTP etc) also

Question - How does (outside) management application initiate a management session? (ex. Email SOAP message requesting device to contact manager).

How will communication between the device and management app occur over HTTP and SMTP: there are difficult questions of how this would be accomplished and of the latency inherent in the different approaches. The point was made that the management application cannot asynchronously say "get this information". Rather, the device (or its proxy) must ask "what do you want me to do" and then listen for instructions. Although a basically interactive dialog could be effected if the device initiated an HTTP connection to the server handling the management application, this would require pretty fast turn around on the port if the server. And the interaction would be quite different if it were over SMTP via a mail server.

It was established that the scope of WBMM has been extended from the preliminary charter to include full intra-enterprise device and service management. To support this, it was suggested that additional scenarios be drawn up to illustrate the need for allowing the management station to cause a connection to be made. It was concluded that, rather than requiring that both device and management station to have both client and server capabilities, a separate simple protocol would be used to allow management stations to request that a device, or all devices contact the management station.

To support extra-enterprise communication, a device-client/management-server configuration is adopted with primary consideration of HTTP/port 80 as the transport.

Just as PSI mandates HTTP but may utilize other valid transports (ex. SMTP), WBMM should be designed with the same criteria

Question to be answered – do we need a well known IANA port registered for WBMM for intra-enterprise applications?
Question to be answered – what protocol or method should be used to allow management servers to alert devices to contact them?

We discussed and agreed to add Unicast and Multicast tickle scenarios but also agreed that WBMM will not reinvent discovery. WBMM should follow PSI in its evaluation and adoption of SLP, DNSsd, SSDP etc. We may need a PWG working group on discovery.

We agreed that both proxy and WBMM native in the device are valid scenarios. Sometimes the environment may have combination of both.

We agreed that it is appropriate for today's management applications (ex. JetAdmin, MarkVision, Network Printer Manager, etc.) to add proxy capability, wherein it converts device data into WBMM

There was agreement to define the model and protocol separately, although there would need to be care to ensure that they were synchronized. Aside from facilitating parallel generation, this would allow the Management Data Model to be used in other places, as well it may be.

Discussion of Harry's suggested operations ftp://ftp.pwg.org/pub/pwg/wbmm/WSDL: (Although these notes reflect suggestions made, it is desirable that these subjects be reviewed at the Portland meeting where more opinions may be considered):

Ira suggested that there be a distinction between Device elements and Service elements, so that there would be:

- GetDeviceElement
- GetServiceElement
- SetDeviceElement
- SetServiceElement

instead of just GetElement and SetElement.
The need for this differentiation appears to relate to how the elements are identified. By making the differentiation in the operation, similar names could be used for service and device elements. Question from Kelli: was this Ira's rationale?

It was understood that the parameters in a GET or SET operation would be a list of elements referring to one of several possible schemas. The operation command itself would be an instance of an XML document, with the schema defined in the structure. Alternatively, the element names themselves could be fully qualified with the schema to which each element refers. Comment from Kelli: the wording here is confusing….need to clarify.

In response to the question of why items such as Reset, OpPanelMessage, Off-line, LockOpPanel, which previously were handled as management items, now in a special execute command message, the contention was expressed that specific actions should be communicated as operations rather than as management objects (or elements). The opinion was further expressed that such actions should be treated as basic operations rather than being expressed as parameters of a more abstract "ExecuteCommand"

operation. Finally, Ira suggested that the operations of this type should include those proposed as the IPP Set 3 operations.

- DisableDevice - Prevents the output device from accepting jobs with any job submission protocol.
- EnableDevice - Allows the output device to accept jobs from any job submission protocol.
- PauseDeviceNow - Stops the output device from marking media as soon as possible on the page or sheet.
- PauseDevice-After-Current-Copy - Stops the output device from marking media after the current copy has been stacked.
- PauseDevice-After-Current-Job - Stops the output device from marking media after the current job has been stacked.
- ResumeDevice - Continues the output device from the last Pause Device operation.
- DeactivateDevice - Puts the output device into a readonly deactivated state.
- ActivateDevice - Restores the output device to normal activity.
- PurgeDevice - Removes all traces of jobs in the output device.
- ResetDevice - Resets the hardware state of the output device and re-initializes the output device software.
- PowerOffDevice - Powers off the output device.

Although not brought up at the time, there is the obvious question as to whether there should be a separate subset of operations concerned with Services. e.g., DeactivateService. Or perhaps, the “device” terms should be dropped so that the operations could apply to either devices or, if applicable, services.

This set does not include Harry’s suggestions of OpPanelMessage, Offline, LockOpPanel, DownloadCode). Although not discussed, I suggest that OFF_LINE is an indeterminate expression, the various interpretations of which are covered in the Set 3 operations. OpPanelMessage, I suggest is reasonably handled as a set variable. The remaining two appear to be potential operations:

- LockOpPanel – Disables input from local operator panel.
- DownloadCode – Instructs device (or service) to accept or acquire executable code.

The understanding is that the element name may refer to a group of elements. As such, a specific GetAll operation would appear unnecessary.