COMPUTERWORLD
ENTERPRISE MANAGEMENT WORLD
SOLUTIONS FOR THE DATA CENTER

DMTF

Web Services Distributed Management

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Agenda

- History and Members
- Web Services Platform
- WSDM Management Using Web Services
  - Foundations
  - Capabilities
- WSDM Management Of Web Services
- Specification Roadmap
- Relationship to other standards organizations

Membership and History

- WSDM was chartered in Feb 2003
  - Management Protocol TC was chartered in 2002 and then rechartered as WSDM with a broader charter
- CoChairs: Heather Kreger, IBM
  Winston Bumpus, Dell, DMTF President
- Broad representation by member companies
  - Management –Amberpoint, BMC, CA, HP, IBM, …
  - Devices – Cisco, Dell, HP, IBM, SUN, …
  - Application Servers –BEA, IBM, Oracle, SUN...
  - Customers – Mitre, …

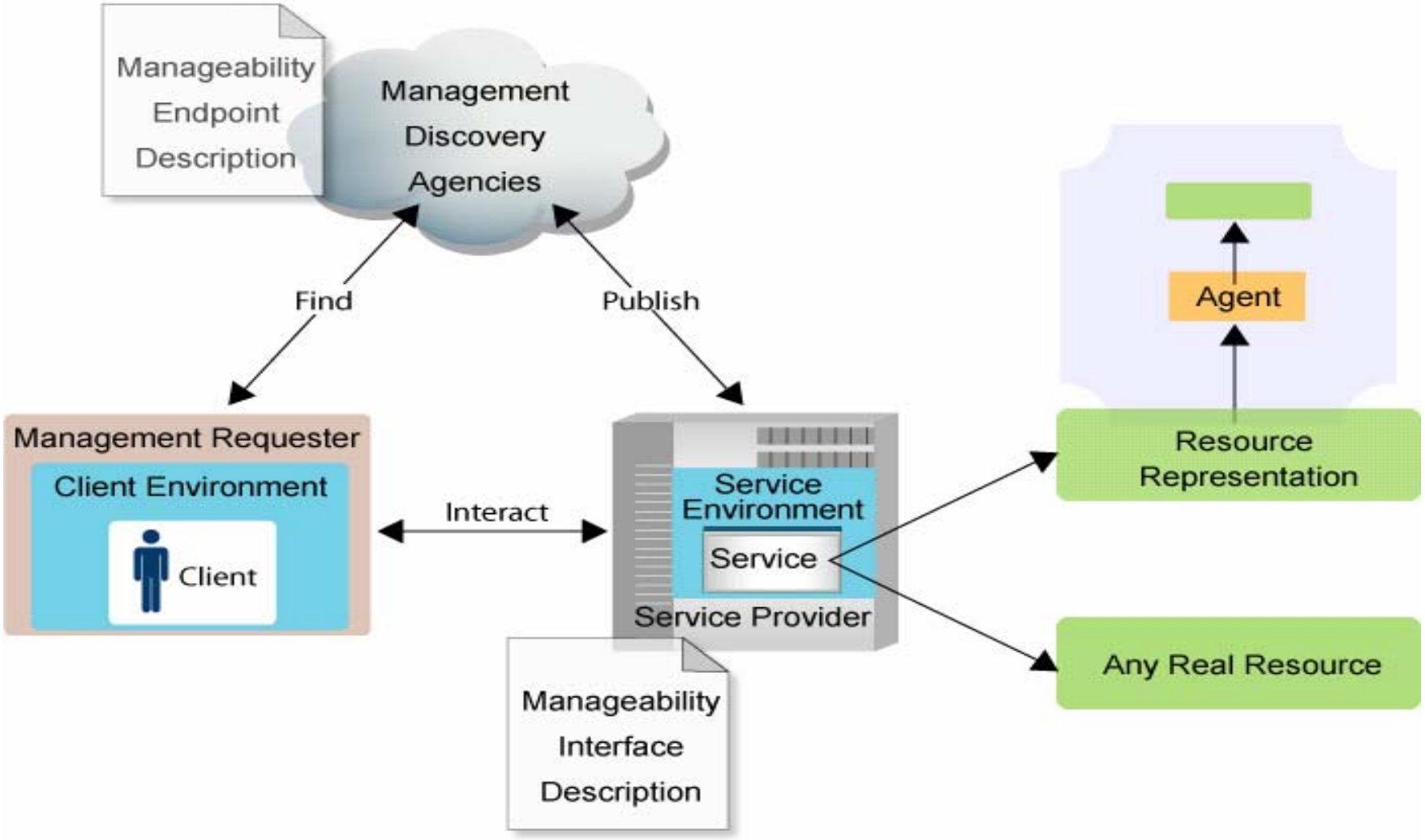
Web Services Distributed Management: Missions

- Management USING Web Services (MUWS)
  - Web services to describe and access manageability of resources
  - Management applications use Web services just like other applications use Web services
- Management OF Web Services (MOWS)
  - An application of Management Using Web Services for the Web Service as the IT resource
- Use Web Services as the distributed computing platform to enable interoperability between managers and manageable resources

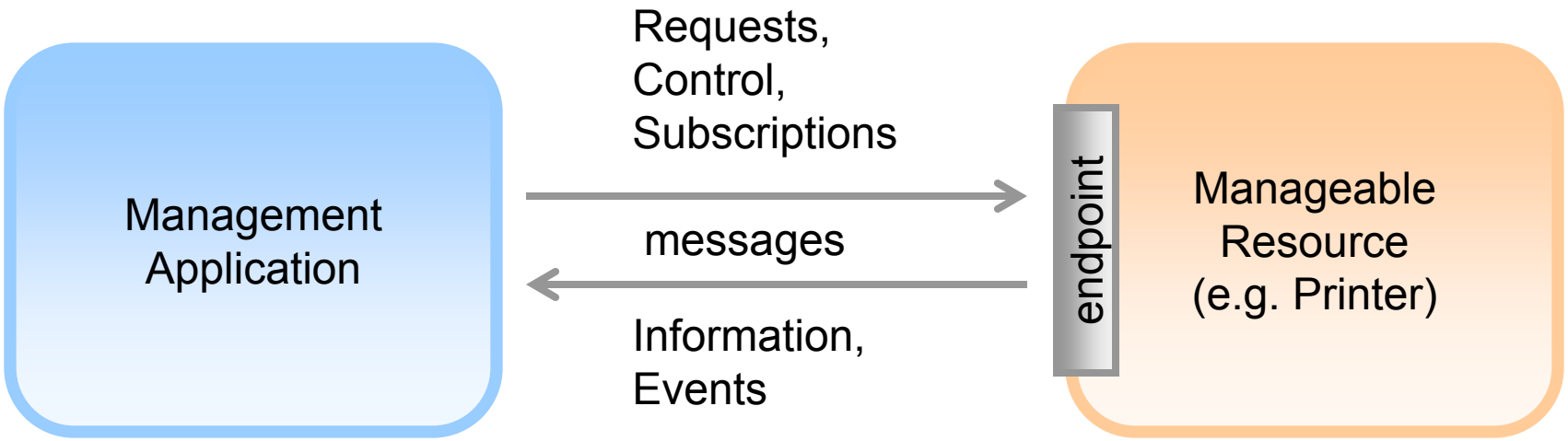
Web Services Distributed Management

- Defines a set of manageability capabilities which manageable resources can choose to support
- Each capability specifies message exchanges, properties, and events
- Capabilities are described by interfaces using WSDL portTypes, WS-Resource Properties, Metadata, and Policies, etc.
  - Foundational Manageability Capabilities:
    - Operational State, Metrics, .. (WSDM)
  - Resource Specific Manageability Capabilities:
    - Web service (WSDM), Disk, etc ... (DMTF, GGF, etc.)
- Defines common manageability services: Registry, Relationships, Collection, …
- Existing models (CIM, SNMP, OMI, OBD-II, etc.) are a source for properties, operations, and events for the schemas and interfaces

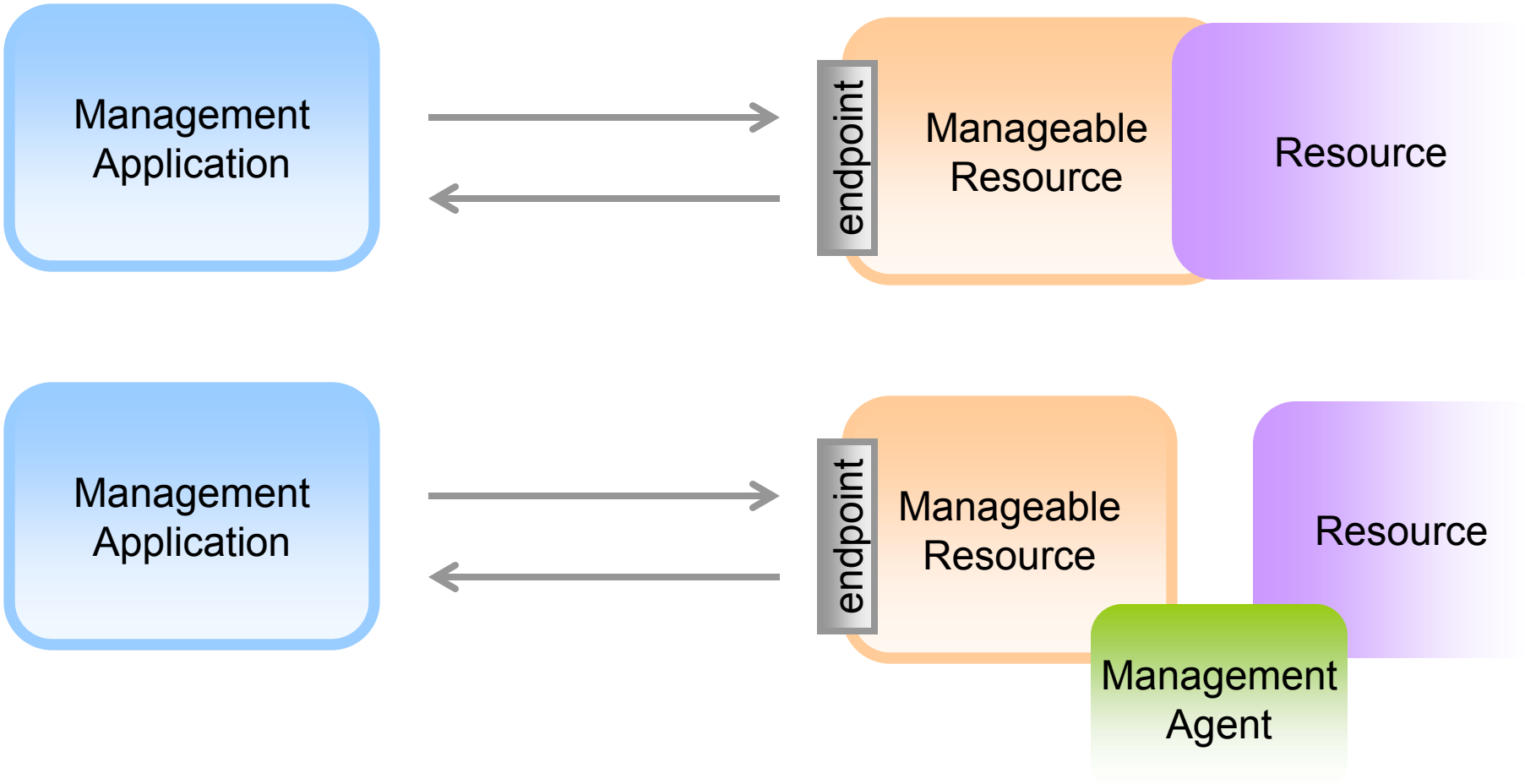
Web Services Architecture and the Manageable Resource



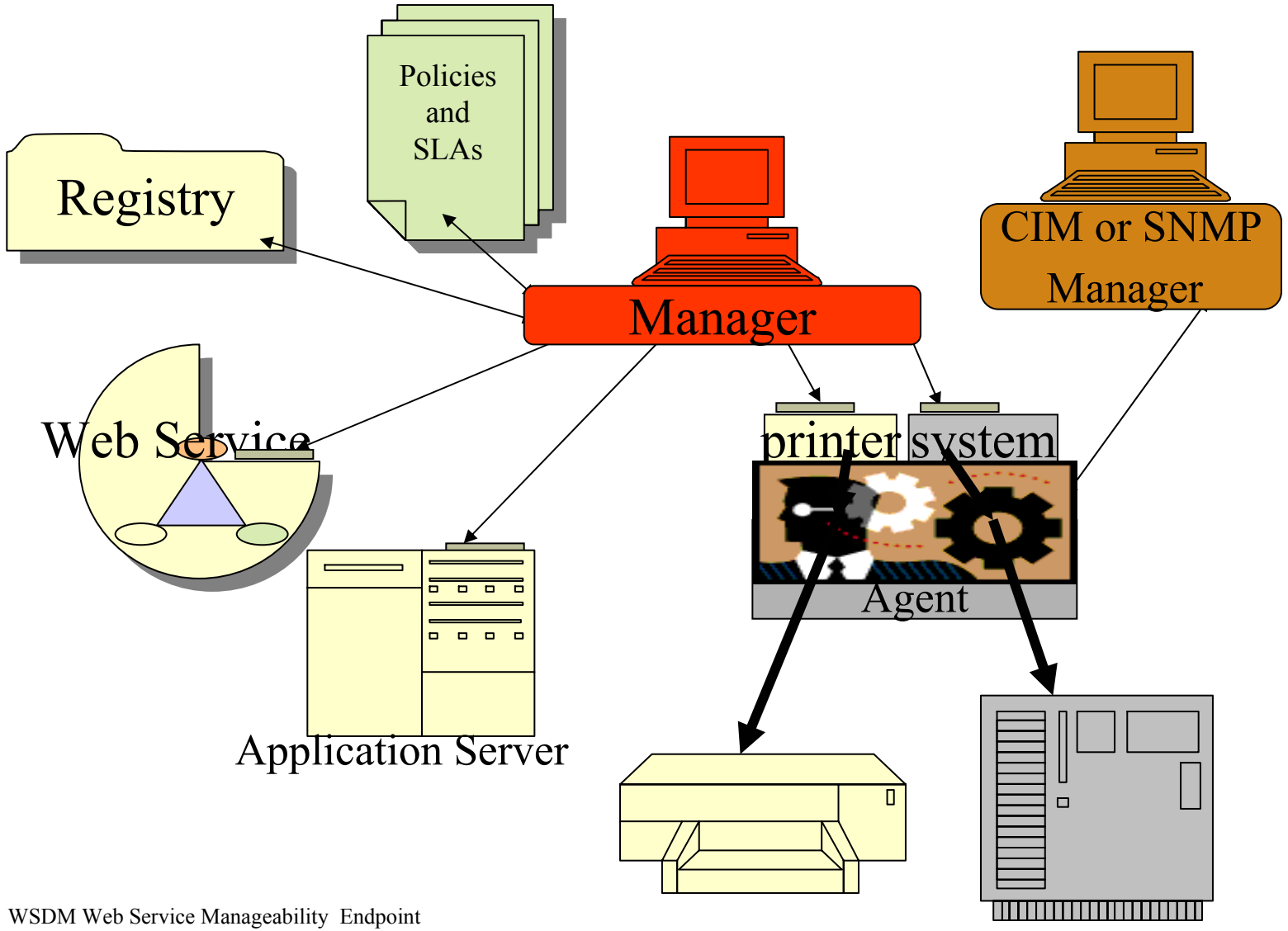
MUWS Concepts



Agentless: Agents or no Agents



A Manager's view



Web Services Distributed Management

- Web services architecture replaces or ‘hides’ the traditional Manager/Agent architecture
- Managers always ‘talk’ to the resource while the actual Web Service endpoint may be supported by any number of management agents
- Web Services de-couple manageability capabilities FROM
  - HOW you access the it
  - WHERE you access the it
  - HOW the it is implemented
  - WHEN it was implemented

WHY Add in this new layer?????

- Managers need access to manageability END TO END
  - Across platforms, languages, applications, AND existing management technologies
  - B2B Web services makes this worse! Federated management is required.
  - SLA Monitoring, WorkFlows, Work balancing, Utility computing, pay-per-Quality of Service…
  - Standards are just starting, we're developing technology to help us solve these up-coming challenges
- Ubiquitous, low entry point infrastructure!
  - HTTP & the Web
- It's JUST distributed computing, again
  - so leverage Web services infrastructure for scalability, security, etc., don't re-invent it
- Integration/interoperability between business and IT management domains of the enterprise
  - Management systems gain visibility into business applications and processes
  - Business applications and processes can take advantage of the manageability of resources

Web Services Platform

Management application requires a Web services platform with the following capabilities:

- XML, XML Schema
- WSDL
- SOAP
- WS-Addressing
- WS-Resource Framework
  - Resource Properties
  - More TBD
- WS-Notification
- WS-Security

Manageable resources only implement the specifications that they need

Management Using Web Services (MUWS)

- Management Foundations
  - Meta information
    - Additional descriptive information about interfaces
    - resources, properties, operations, notifications
  - Relationships
    - Association between two IT resources
    - Relationship expression schema and property
  - Management Event Format
    - XML format, carry events from any source
  - Discovery
    - Creating manageable resources from traditional discovery engines
    - Finding resources
    - Introspection of manageability capabilities

Management Using Web Services

- Manageable Resource:
  - Is a Web Service
    - Described by WSDL, WS-Resource Properties, Meta information, Policies,
  - Is a WS-RF WS-Resource
  - MUST support WSDM's Identity capability with properties (ResourceID, optional Name and Version).
  - Advertises the properties/operations (message exchanges) of the resource to be managed

Management Using Web Services

Capabilities

- Specification of composable semantics to enable a management task
- WSDL, WS-Resource documents, Meta Information, Policies, Notification topics
  - Identity
  - Metrics
  - Operational State
  - Configuration
  - Correlatable Names
  - Relationships

Capabilities – Operational State

- State property
- Events on state changes
- Mechanisms to convey the state model
  - Resource model defines the resource specific state models and semantics
- Tying Operations to state changes is being explored

Capabilities - Metrics

- Defining standard metric types/behaviors (collaboration with DMTF Metrics WG)

- Each metric contains its Type, Time scope, LastUpdatedAt, ResetAt
  - IntegerMetric
  - DurationMetric
- Properties: CurrentTime

  Resource specific metrics
- Operations: none

Management Of Web Services

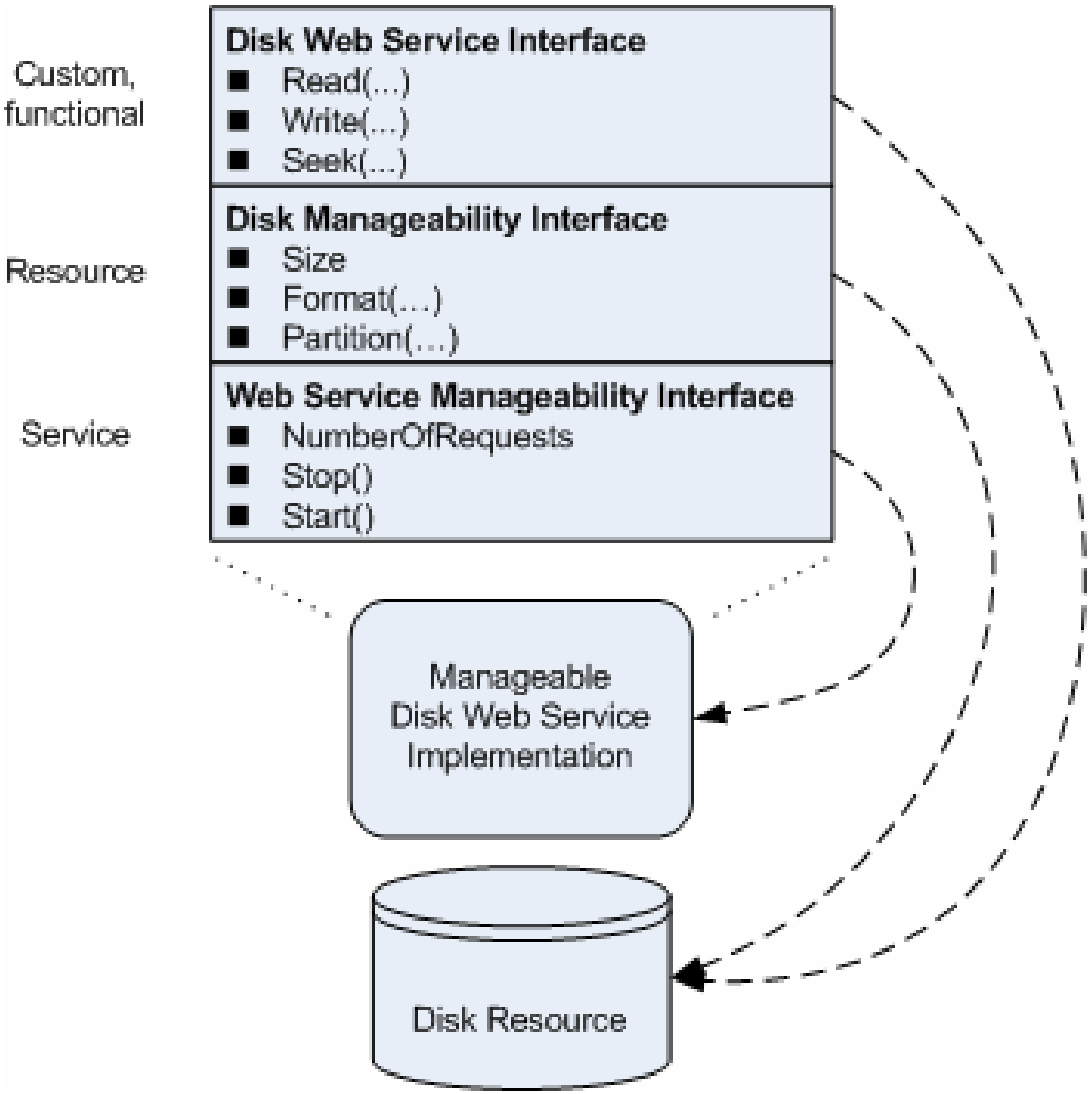
- Based on Management Using Web Services
- Reuses work from W3C Web Services Architecture Management Task Force work for
  - Lifecycle, Request Processing, Metrics, Endpoint

- Specifies composeable manageability capabilities for use by Web services architects, designers and implementers
- Manageability for the service side of the IT resources and applications exposed as Web services
- Common base for use by Web services management applications

Management of Web Services

- **Simplification**
  - Use of Web services technologies for management purposes
- **Unification**
  - Manageability capabilities defined and useable just like any other operational capability of a service
  - Composeable with operational capabilities
- **Integration**
  - Management applications gain visibility into business/operational side of applications
  - Business applications and processes can use manageability capabilities to their advantage

Composeability



Composeability in SOAP

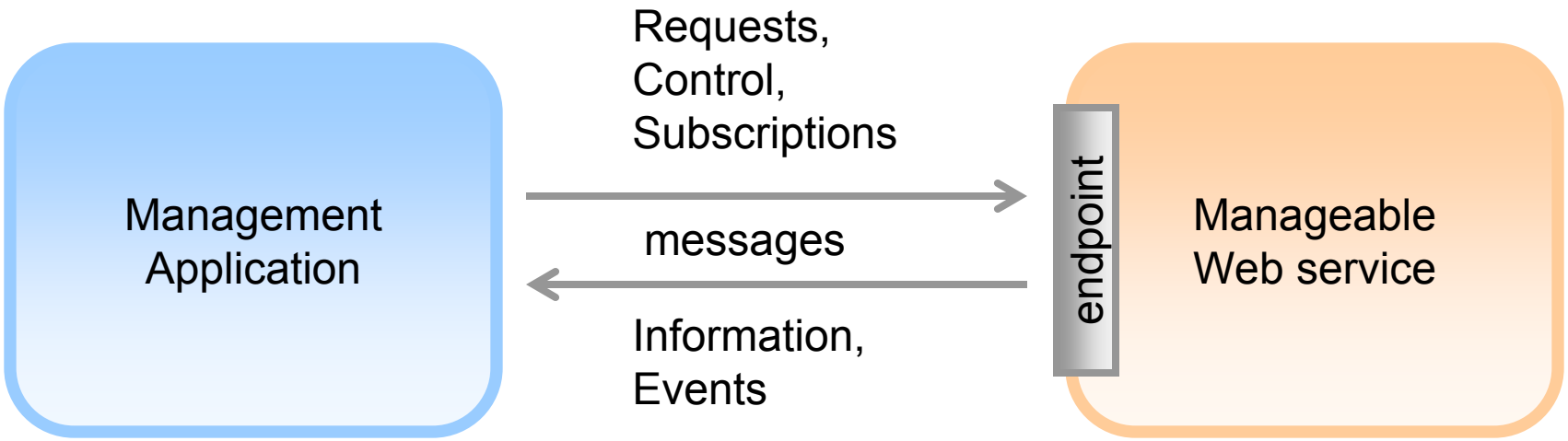
<s:Envelope …>

<s:Header …>
…
<muws:ResourceID>…</muws:ResourceID>
…
<s:/Header>

<s:Body …>
  <wsrp:GetMultipleResourcePropertiesResponse>
<disk:Size units="gigabyte">200</disk:Size>
<mows:NumberOfRequests>1237834596</mows:NumberOfRequests>
  </wsrp:GetMultipleResourceProperties>
</s:Body>

</s:Envelope>

MOWS Concepts



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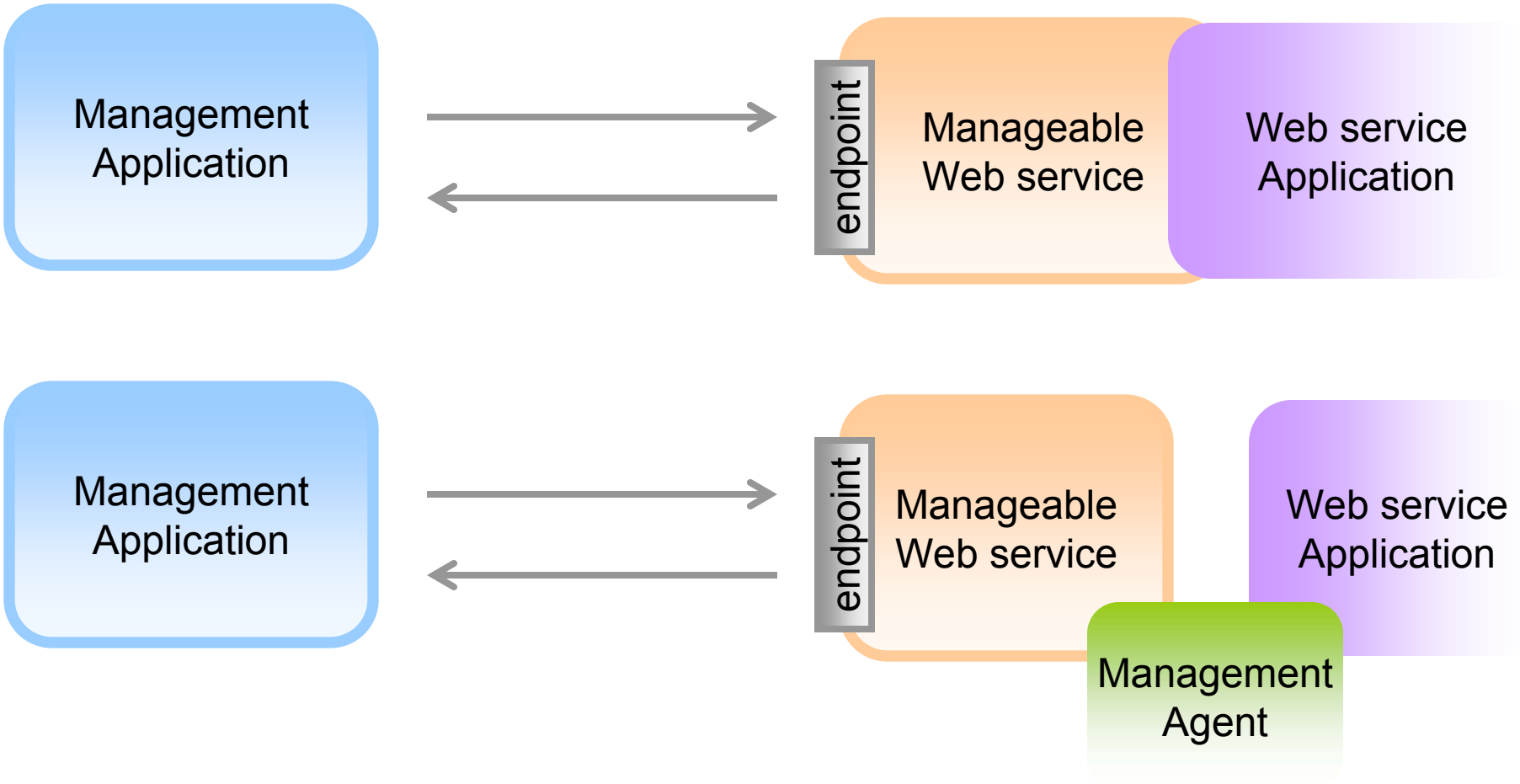
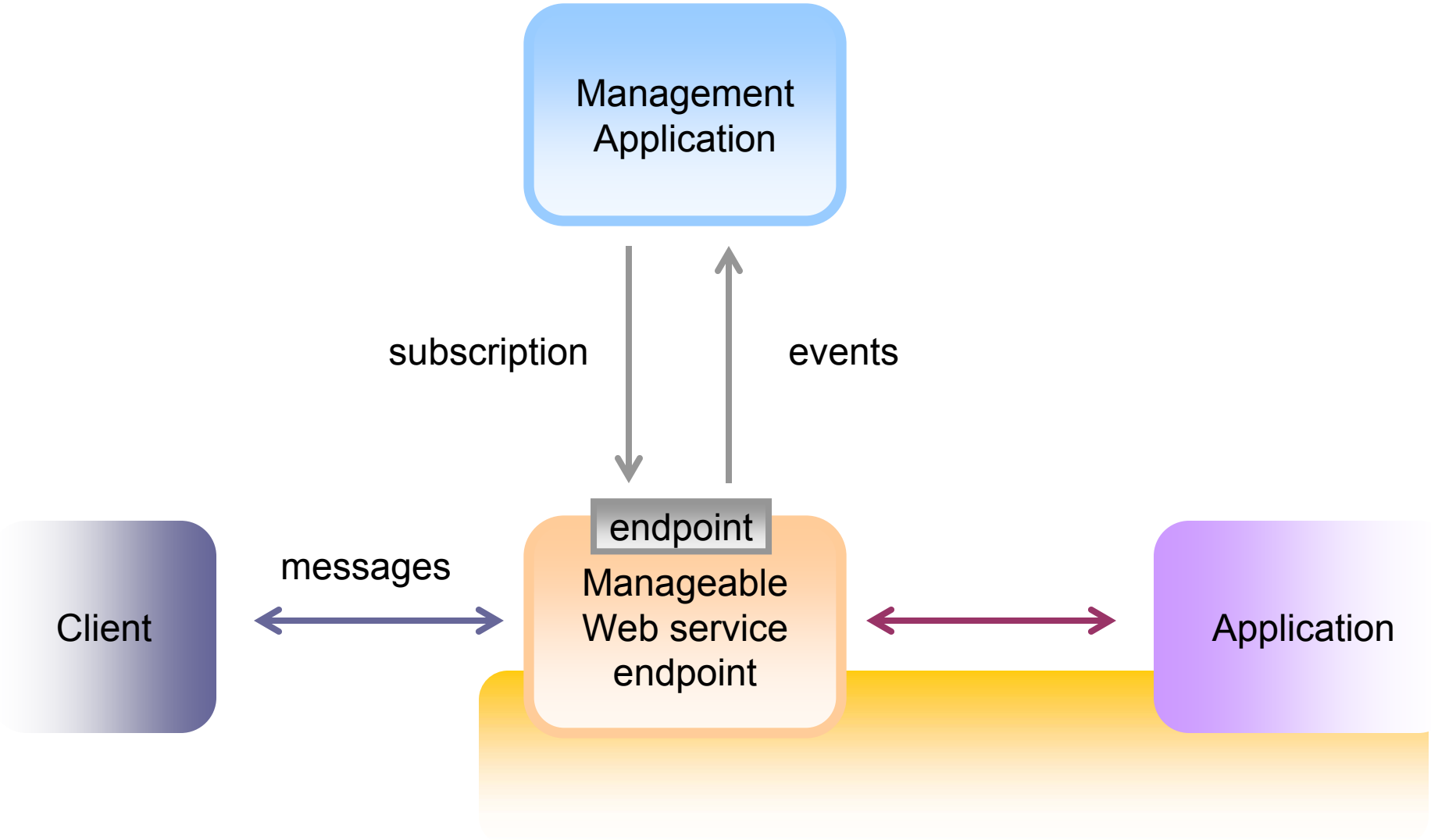


Manageable Web service endpoint resource (WSDM 1.0)

- Identity -> MUWS
- Identification
  - Refers to the Web service endpoint being managed
- Metrics
  - Common set of quantifiable information about the endpoint behavior
- Operational State -> MUWS
- Request Processing State
  - Notifications against requests being processed by the endpoint
- Relationships -> MUWS

Request Processing State Capability Concepts



WSDM 1.0 MOWS Use In

- Service Level assessment
- Service Agreement monitoring
- Availability management
- Performance management
- Content-based monitoring
- Application of management and security policies
- Security audit
- Many others…

Key Points to note

- Convergence of management and business/operational semantics in applications
  - Architect manageable Web services applications
  - Use of Web services technologies allows management to be instrumented in the same way as business applications are instrumented
  - Use manageability information in business applications to increase agility, resilience, flexibility, etc.
- Composeability allows the introduction of manageability into applications without disrupting their business purpose

WSDM Specification Roadmap

Initial contributions from:

- HP: Web Services Management Framework (WSMF)
- IBM, CA and TalkingBlocks (now HP): WS-Manageability

WSDM 0.5 – April 2004

- Identification
- Metrics
- Operational State
- Successful Interoperability testing among vendors and users

WSDM Specification Roadmap

WSDM 1.0 – targeted for November, 2004

- Extend 0.5 capabilities with events and meta information
- Extend Operational State
- Extend Metrics
- Relationships
- Configuration
- Web service endpoint Request Processing State

WSDM Specification Roadmap

WSDM 2.0 – targeted for November, 2005

- Updated for standardized versions of specifications in draft now
- Other candidates:
  - Policy
  - Provisioning
  - TBD

Relationship to Other Standards Work

- W3C
  - WS Description WG
  - WS Arch WG
- DMTF
  - WIP and its WS-CIM subgroup
  - Utility WG
  - State and Behavior WG
- GGF
  - OGSA Common Manageability Model WG
- OASIS
  - Web Services Resource Framework
  - WS-Notification
  - WS-Security

Q & A

Resources and Supporting Material

- WSDM
  - http://www.oasis-open.org/apps/org/workgroup/wsdm/m
  - Specifications: http://www.oasis-open.org/apps/org/workgroup/wsdm/documents.php
- OASIS – http://www.oasis-open.org
- DMTF – http://www.dmtf.org
- GGF – http://www.ggf.org
- W3C – http://www.w3c.org

DMTF

Models real world managed objects. Large existing model

- Interoperability Working Group
  - WS-CIM - Defining a Web Services access to CIM models and CIM/OMs
  - CIM V3 is moving towards XML schema
- State and Behavior WG
  - State model for CIM
- Utility WG
  - Resource Profiles rendered as Web services
- Application Working Group

Global Grid Forum (GGF)

- OGSA (and related WGs) should be able to use WSDM specifications for the base manageable resource
  - CMM joined WSDM
- WSDM technologies fit into the OGSA taxonomy of requirements of a Web services platform