ON THE STANDARDIZATION OF WEB SERVICES MANAGEMENT OPERATIONS

AIKO PRAS
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WHY WEB SERVICES?

EVOLUTION OF SNMP FAILED

NEW TECHNOLOGIES ARE NEEDED

WEB SERVICES MAY BECOME THE MOST IMPORTANT MIDDLEWARE TECHNOLOGY

WILL BECOME AVAILABLE ON ALL FUTURE PLATFORMS

WILL BE APPLIED FOR MANY KINDS OF APPLICATIONS

IMPLEMENTATION OF WS APPLICATIONS IS RELATIVELY SIMPLE

MANY SKILLED DEVELOPERS

MANY TOOLS
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FUTURE MANAGEMENT EXPERTS CAN CONCENTRATE ON MANAGEMENT APPLICATIONS INSTEAD OF MANAGEMENT TECHNOLOGY
WHAT ARE WEB SERVICES?

CLIENT

[Diagram showing a client interacting with a UDDI repository through SOAP/WSDL]

Web service

Web service

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STRUCTURE OF A WSDL DEFINITION

ABSTRACT INTERFACE TO THE WEB SERVICE
  Independent of a specific transport protocol and Web address

BINDING
  To associate the abstract interface with a transport protocol

SERVICE
  To associate the abstract interface with a Web address
<message name="getIfInOctetsRequest">
    <part name="password" type="xsd:string"/>
    <part name="interfaceNumber" type="xsd:unsignedInt"/>
</message>

<message name="getIfInOctetsResponse">
    <part name="value" type="xsd:unsignedInt"/>
</message>

<interface name="IfDataServiceInterface">
    <operation name="getIfInOctets">
        <input message="myns:getIfInOctetsRequest"/>
        <output message="myns:getIfInOctetsResponse"/>
    </operation>
</interface>
<binding name="ifDataServiceBinding"
    interface="myns:IfDataServiceInterface">
    <soap:binding style="rpc" transport="http://schemas.xmlsoap.org/soap/http"/>
    <operation name="getIfInOctets">
        <soap:operation soapAction=""/>
        <input>
            <soap:body use="encoded" namespace="urn:..."
                encodingStyle="http://schemas.xmlsoap.org/soap/encoding/"/>
        </input>
        <output>
            <soap:body use="encoded" namespace="urn:..."
                encodingStyle="http://schemas.xmlsoap.org/soap/encoding/"/>
        </output>
    </operation>
</binding>
<service name="ifDataService" interface="myns:IfDataServiceInterface">
  <endpoint name="ifDataServiceEndpoint" binding="myns:ifDataServiceBinding">
    <soap:address location="http://my.webservice.com/ifData"/>
  </endpoint>
</service>
MODULAR WSDL STRUCTURE

IF MODULE
<message ...
<operation ...
getIfTable

IP MODULE
<message ...
<operation ...
getRouteTable

IF BINDING
#import IF MODULE
<binding ...
SOAP

IP BINDING
#import IP MODULE
<binding ...
SOAP

STANDARDIZED
SITE/DEVICE SPECIFIC

MY MGT. SERVICE
<import IF BINDING
<import IP BINDING
<service http://...
TRANSPARENCY AND GRANULARITY

Parameter transparency

Get(XML document)  GetIfInOctets(XML document)

Get(OID, password, value)  GetIfInOctets(InterfaceNumber, password, value)

Operation granularity
PARAMETER TRANSPARENCY

NON-TRANSPARENT
Get(IIfInOctets, interfaceNumber=2, password=public, value=664298)

TRANSPARENT
Get(XMLdocument)
PARAMETER TRANSPARENCY

NON-TRANSPARENT
Get(IIfInOctets, interfaceNumber=2, password=public, value=664298)
  • Data parsed / type checked at WSDL level
  • Single level of standards: WSDL
  • Easy integration with standard applications (e.g. spreadsheet, database)
  • Occasional managers (home environments)

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TRANSPARENT
Get(XMLdocument)
• Data parsed by higher level application
• Multiple levels of standards: WSDL operation & XML data
  • Powerful (e.g. XPATH / XQUERY)
    • Harder to use
  • Professional managers (operators)
OPERATION GRANULARITY

FINE GRANULARITY
GetIfInOctets(interfaceNumber=2, password=public, value=664298)

COARSE GRANULARITY
Get(IfInOctets, interfaceNumber=2, password=public, value=664298)
OPERATION GRANULARITY

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OPERATION GRANULARITY

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  • Occasional managers (home environments)

COARSE GRANULARITY
Get(IfInOctets, interfaceNumber=2, password=public, value=664298)
  • Allows creation of a Containment tree
  • Allows scoping and filtering (like CMIP)
    • Harder to use
  • Professional managers (operators)
COARSE GRANULARITY - CONTAINMENT & SCOPING

CONTAINMENT

- get(*)
- get (IfTable.*.IfInOctets)

SCOPING

- get (base_element, depth)
FURTHER WORK

IMPLEMENTATION EXPERIENCE

PERFORMANCE MEASUREMENTS

GET OPERATIONAL EXPERIENCE

SECURITY

transactions

...
CONCLUSIONS

WSDL DESCRIPTIONS CAN BE SPLIT INTO
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FOR PROFESSIONAL MANAGERS:
• TRANSPARENT PARAMETERS
• COURSE GRANULARITY OF OPERATIONS
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FOR OCCASIONAL MANAGERS:
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