UNITE 2006
Technology Conference

Web Services:
The Easy Way to Enterprise-Enable Your MCP Applications and Data

F. Guy Bonney
MGS, Inc.

Session MCP3033

9:15am – 10:15am

Wednesday, October 11, 2006

MGS INC
Computer Business Solutions

MGS INC

Computer Business Solutions

Who is MGS, Inc.

- Software Engineering, Product Development & Professional Services firm founded in 1986
- We provide products and services to solve business problems:
  - **Software Engineering Services**
  - **Professional Services**
    - **Management Support Services**
    - **Consulting and Technical Services**
    - **Application Development Services**
    - **Training Services**
  - **Product Development**

MGS INC
Computer Business Solutions

Why Listen to MGS, Inc.

- Over 30 years experience in computer solutions
- Experts in making computer solutions both reliable and efficient
- Experienced in a variety of hardware/software technologies
- Experts in operating system design and management
- Experts in data communications
- Experienced in solutions requiring multiple, diverse platforms

MGS INC
Computer Business Solutions

Web Services

- In this presentation you will learn about …
  - The “Vision”
  - The “Reality”
  - The “Business Case”
  - The “Technology”
  - The “MCP Implementation”
  - The “Future”

MGS INC
Computer Business Solutions

Web Services – The Vision

- Major players
  - Microsoft
  - HP
  - IBM
  - Sun
- Goal
  - Make Internet program-to-program exchanges as easy as browsing the Web

MGS INC
Computer Business Solutions

Web Services – The Vision

- Internet based
- Universal directory
  (like TCP/IP host name services)
- “Loose Coupling” between service provider and service consumer
  - Anonymous client
  - Service discovery
  - Flexible data content
  - asynchronous
- Charge per service
- Create a world-wide fabric of computing services (and commerce)

MGS INC
Computer Business Solutions

Web Services – The Vision

- The Web Services Provider …
  - Service provider publishes a service
    - Deploys on an Internet connect computer
    - Publishes service in a global Internet directory
  - Provider establishes a way for customer to purchase the service

MGS INC
Computer Business Solutions

Web Services – The Vision

- The Web Services Client …
  - Client shops the global Internet directory for the desired services
  - Software Interactive Development Environments (IDE) natively support browsing the directory and incorporation of service “objects”
  - Client purchases services necessary for the application
  - Develop/deploy application
  - Client applications use the Web Service(s) to provide business solutions

MGS INC
Computer Business Solutions

Web Services – The Vision

- In Conclusion …

MGS INC
Computer Business Solutions

Web Services – The Reality

- Mission critical applications cannot depend on:
  - the Internet
  - “vended” services
  - the hope that someone is vending needed services
  - the hope that “vended” services operate exactly as the business requires
- Business interfaces do not benefit from:
  - Dynamic service discovery
  - Data flexibility

MGS INC
Computer Business Solutions

Web Services – The Reality

- Similar to the problem of truly "open" systems
  - The "vision" never quite comes to fruition. No one vendor can/will take responsibility for the whole thing.
  - Difficult to make reliable
  - Problems in developing an integrated solutions (the parts never quite fit together)
  - Difficult to manage and maintain

Web Services – The Reality

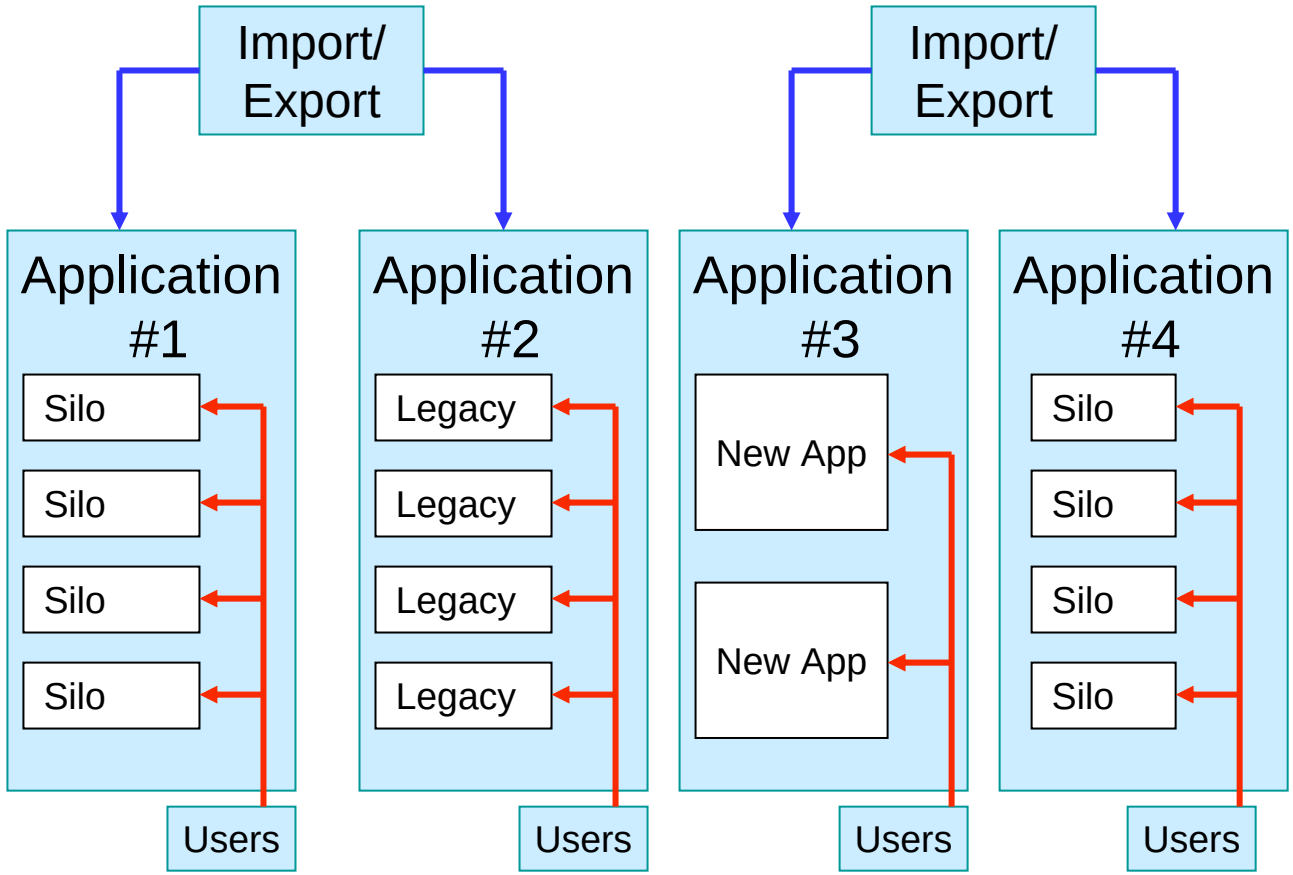
- The Web Services concept contains extremely powerful elements:
  - Simple, well-defined, standards-based interface
  - Technology independent implementation
  - Each set of services has a description file
  - Integrated directory of service descriptions and documentation

Web Services – The Reality

- Services Oriented Architecture (SOA)
  - Componentize new Enterprise business functions
  - Encapsulate existing business functions for easier access
  - IT Functionality now available as a set of objects that can be mixed and matched as needed
  - Application development done by architecting service consumers
  - Avoids tying a user to a specific application implementation
  - Avoids tying data to a specific application implementation

Web Services – The Reality

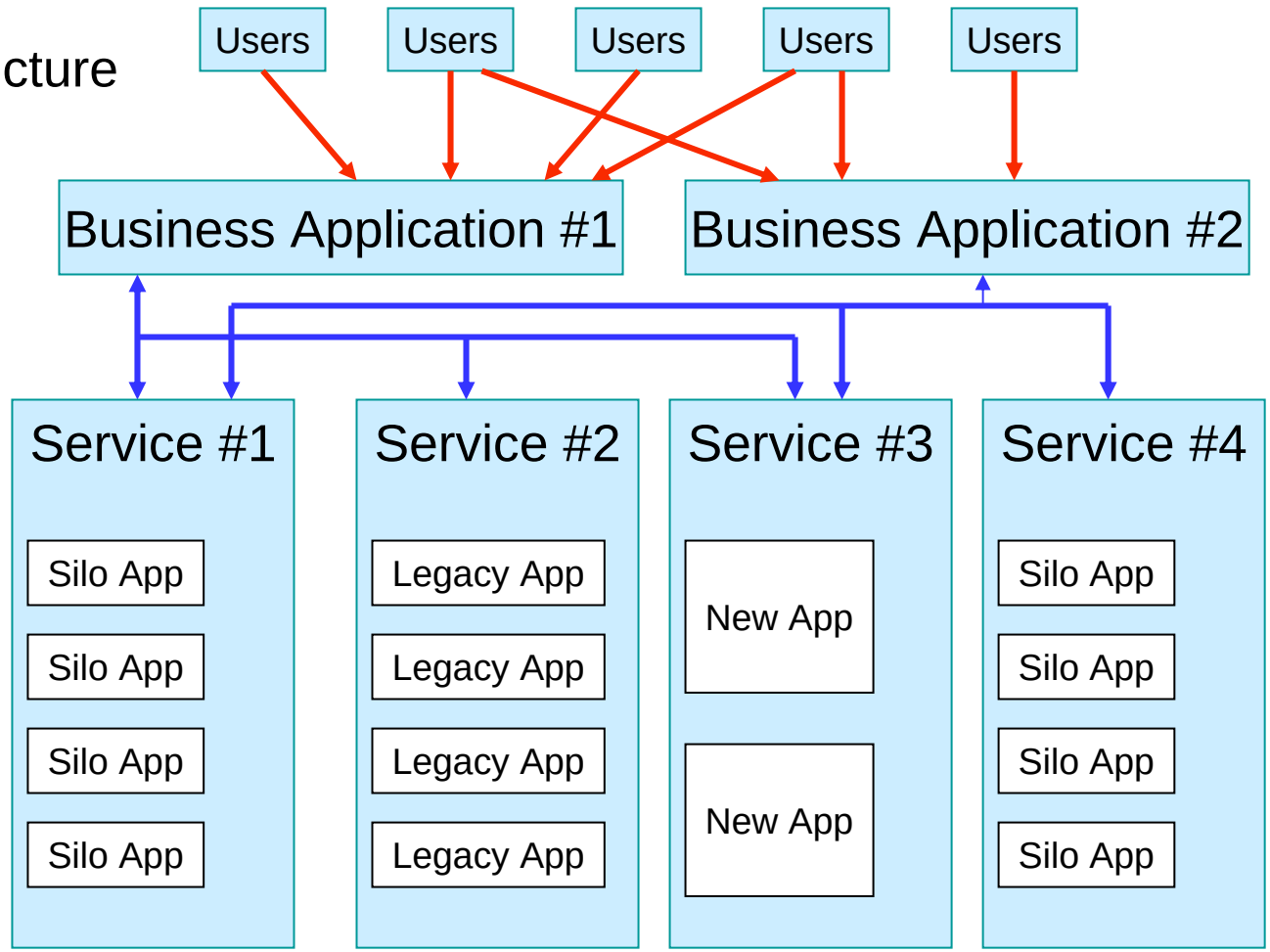
Traditional Architecture



MGS INC
Computer Business Solutions

Web Services – The Reality

SOA Architecture



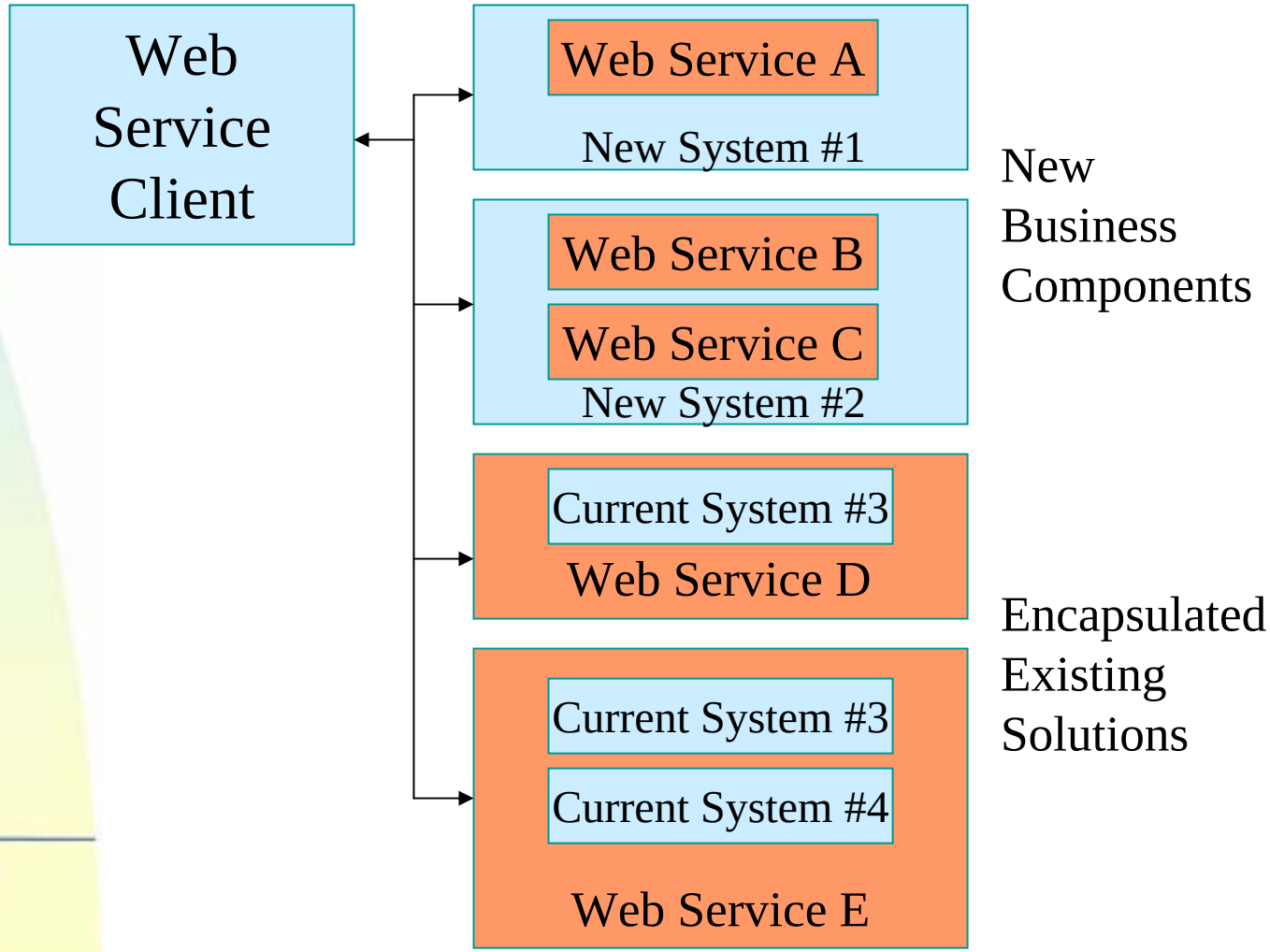
MGS INC
Computer Business Solutions

Web Services- Business Case

- Simpler and more flexible then "open" transaction protocols
  - **EDI – Electronic Data Interchange**
  - **DTP – Distributed Transaction Processing (OLTP)**
- Not technology dependent
  - **RPC – Remote Procedure Calls**
  - **DCOM – Distributed Component Object Model**
  - **RMI – Remote Method Invocation**
  - **CORBA – Common Object Request Broker Architecture**

MGS INC
Computer Business Solutions

Web Services- Business Case



MGS INC
Computer Business Solutions

Web Services- Business Case

- Built on proven Internet communications standards
  - **HTTP – HyperText Transfer Protocol**
  - **SOAP – Simple Object Access Protocol**
  - **XML – eXtensible Markup Language**
- Includes service description and service directory
  - **WSDL – Web Services Description Language**
  - **UDDI – Universal Description, Discovery and Integration**

MGS INC
Computer Business Solutions

Web Services- Business Case

- Supported by software IDEs
  - Discovery of service
  - Automatic creation of Web Services client objects
  - Web Services Server object support
    - WSDL generation
    - UDDI update
    - Server program

Web Services- Business Case

- Supported by software IDEs
  - Included as part of the application framework
    - Microsoft .NET
    - Sun Microsystems J2EE
    - Unisys EAE
  - Support for MCP 3GL Applications
    - MGS-Web
    - Unisys ePortal
    - SBG Web Services Gateway

MGS INC
Computer Business Solutions

Web Services- Business Case

- Abstracts out business functionality
  - Creates machine (technology) independent functionality
  - Indirect reference to service
  - Trivial to re-locate the business function or functions
  - Improved scalability
  - Improved ability to re-host

Web Services- Business Case

Programs Worldwide in 2001 (in millions)

	Custom Applications	Application Packages
Total	87.2	5.6
Windows	5.9	0.4
UNIX	15.7	1.0
Other	65.5	4.2

Aberdeen Group, February 2002

MGS INC
Computer Business Solutions

Web Services- Business Case

- Leverage existing business functionality
  - Rewrites are expensive
  - Redesigns are even more expensive
  - Placing a Web Services envelope around existing functionality is relatively inexpensive
  - Preserves investment in known, reliable business solutions

Web Services- Business Case

- Use ***proven*** Web Services elements to solve your business problems
  - Organize IS services
    - **Description of each service**
    - **Directory of services**
  - Implement functionality shared between dissimilar systems
  - Provide well defined interfaces between business units
  - Leverage existing functionality
  - Not dependent on proprietary technology
  - Ease of use (IDE support)

MGS INC
Computer Business Solutions

Web Services - Technology

Definition:

A Web service is a software application identified by a URI, whose interfaces and bindings are capable of being defined, described, and discovered as XML artifacts. A Web service supports direct interactions with other software agents using XML based messages exchanged via internet-based protocols.

WC3 Web Services Architecture Requirements Working Draft
11 October 2002

MGS INC
Computer Business Solutions

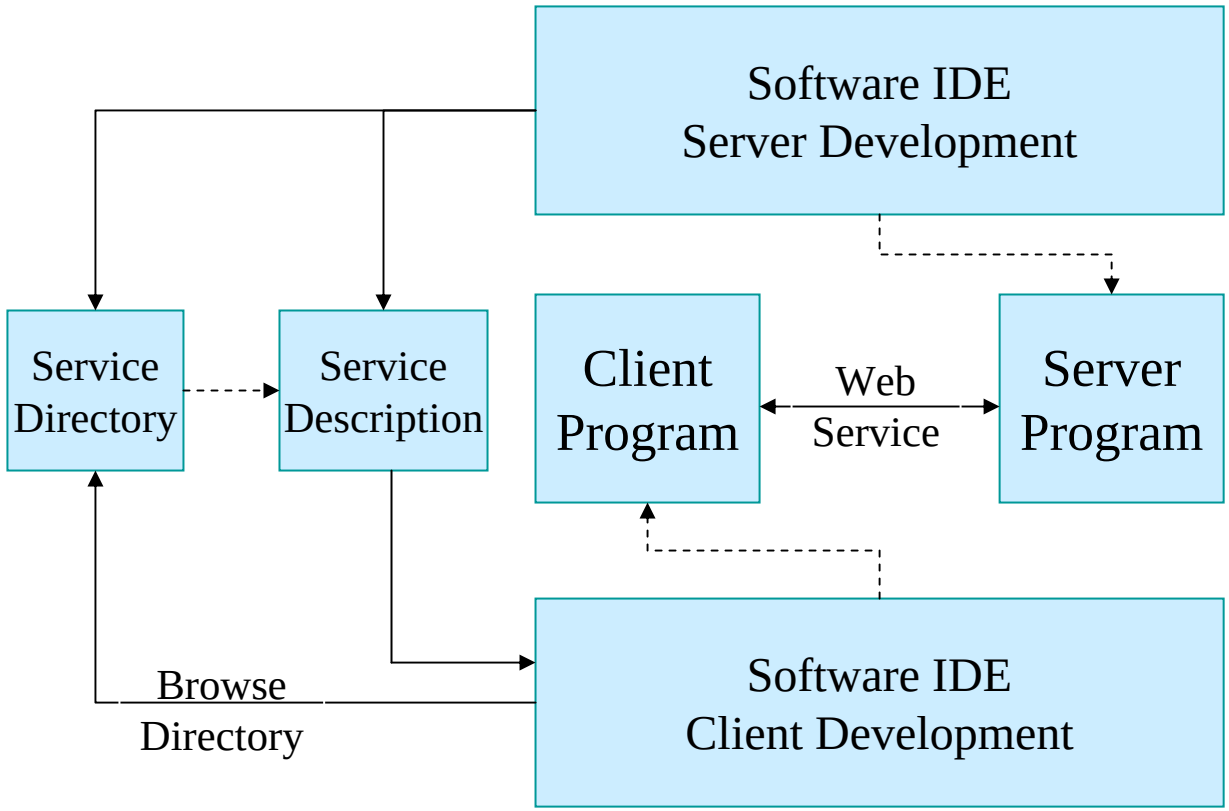
Web Services - Technology

- Development components:
  - Business function (application)
  - Web Service definition (WSDL)
  - Web Service directory (UDDI)
  - Web Service enabled IDE
    - UDDI browser
    - Create client objects from WSDL
    - Create Web Services servers
- Runtime components
  - Client application program
  - HTTP or HTTPS protocol
  - SOAP protocol
  - XML data request/response
  - Server application program

Web Services- Technology

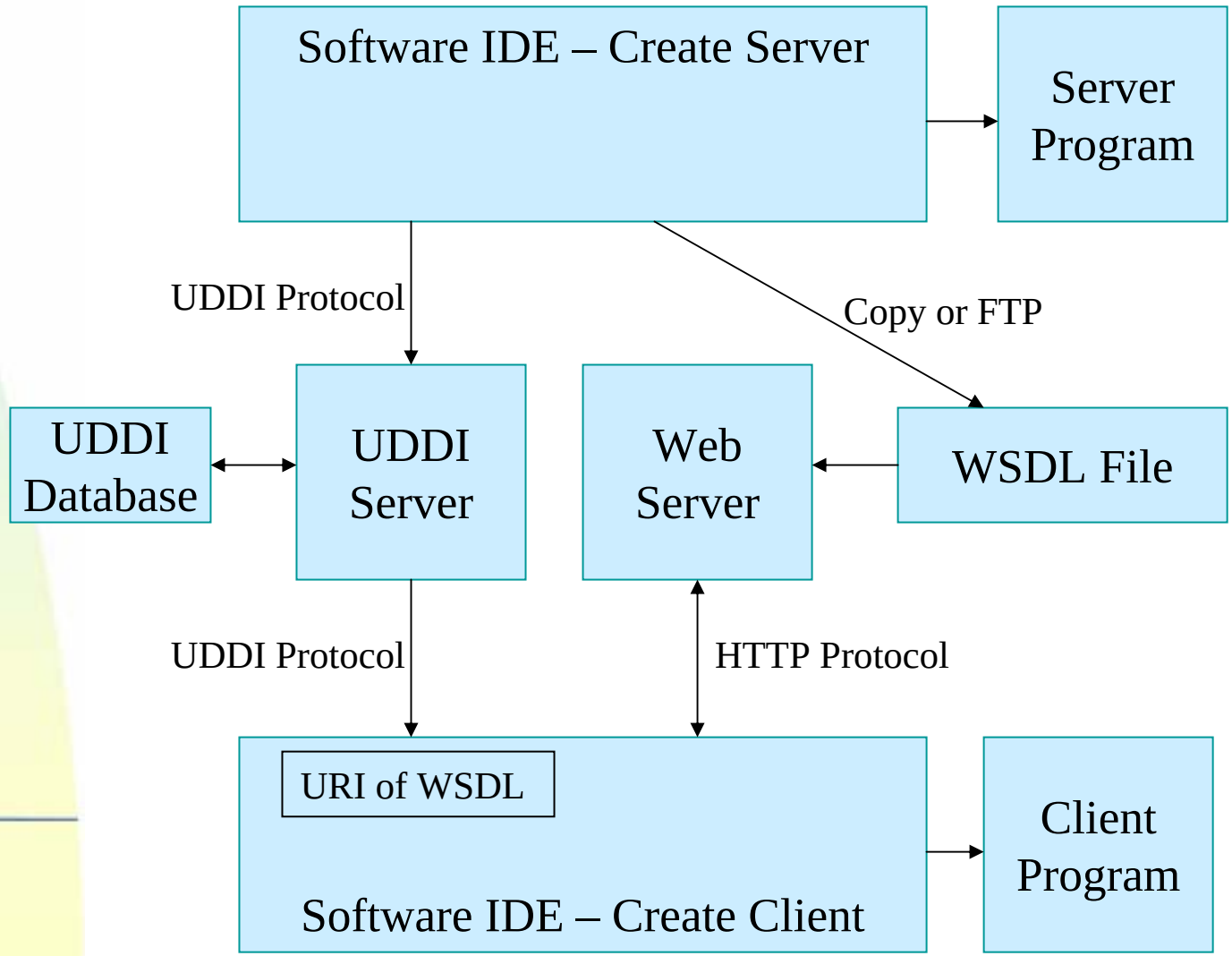
- Directory contains Web Service description and documentation
  - **UDDI** – Universal Description, Discovery and Integration
  - **WSDL** – Web Services Description Language
- UDDI specifies WSDL location with a URI
  - For use with HTTP
  - Includes web server host name
  - Includes WSDL file name

Web Services- Technology



MGS INC
Computer Business Solutions

Web Services- Technology



MGS INC
Computer Business Solutions

Web Services- Technology

WSDL File Excerpt:

```
<message name="WSTEST_SCRN01">
  <part name="Trancode" type="xsd:string" />
  <part name="Input_data" type="xsd:string" />
</message>
<message name="WSTEST_SCRN01Response">
  <part name="Trancode" type="xsd:string" />
  <part name="Input_data" type="xsd:string" />
  <part name="statusLine" type="xsd:string" />
</message>

<service name="COMSWebServices">
  <documentation>Access COMS applications via Web Services
  </documentation>
    <port name="WSTEST" binding="wsdl:WSTESTHttpBinding">
    <soap:address location="http://laptop1mcp/COMSWebServices/" />
    </port>
</service>
```

MGS INC
Computer Business Solutions

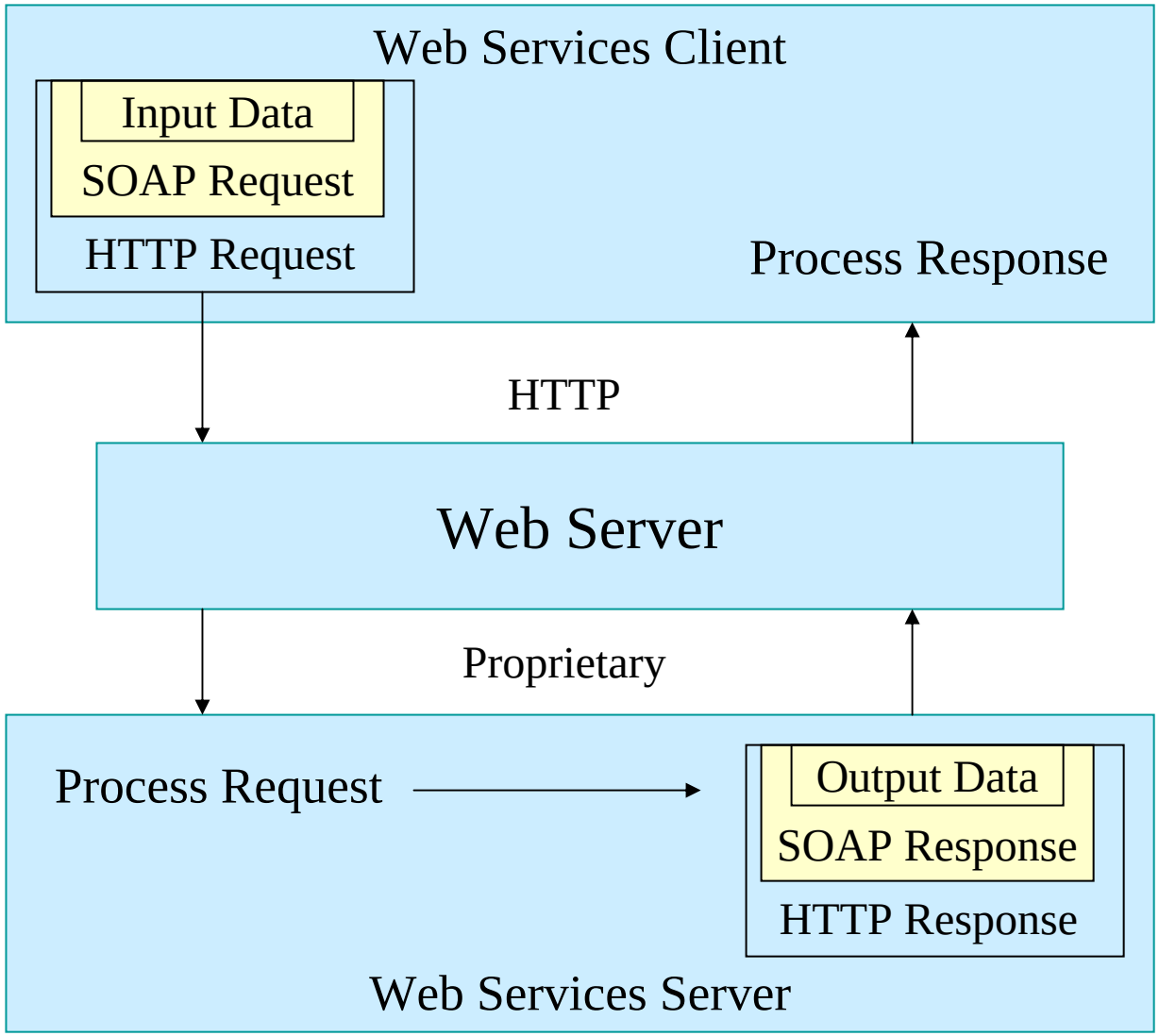
Web Services – Technology

- Web Services is built on Internet communications standards
  - **HTTP –** HyperText Transfer Protocol
  - **SOAP –** Simple Object Access Protocol
  - **XML –** eXtensible Markup Language
- Web service is addressed with the server's URI obtained from the WSDL

MGS INC
Computer Business Solutions

Web Services – Technology

Indicates XML Encoding



MGS INC
Computer Business Solutions

Web Services – Technology

SOAP Request:

```
<soap:Envelope>
  <soap:Body>
    <tns:WSTEST_SCRN01>
      <Trancode>SCRN01</Trancode>
      <InputData>lower case letters</InputData>
    </tns:WSTEST_SCRN01>
  </soap:Body>
 </soap:Envelope>
```

SOAP Response:

```
<soap:Envelope>
  <soap:Body>
    <tns:WSTEST_SCRN01Response>
      <Trancode>SCRN01</Trancode>
      <InputData>LOWER CASE LETTERS</InputData>
      <statusLine />
    </tns:WSTEST_SCRN01Response>
  </soap:Body>
 </soap:Envelope>
```

MGS INC
Computer Business Solutions

Web Services - MCP

- MCP Apps as Web Services
  - 3GL Support
    - Wintel Gateway Server (ePortal, SBG)
    - MCP Based Client & Server (MGSWeb)
  - EAE (AB Suite) Integration
    - Both Web Services Server and Client
    - Uses Wintel Gateway

MGS INC
Computer Business Solutions

Web Services - MCP

- MCP Apps as Web Services
  - Requires some form of wrapper around the MCP functionality
  - Wrapper allows Web Service request to be routed to/from MCP application
  - Non-proprietary Connection to MCP applications via COMS
    - COMS Station
    - TP-to-TP (may require small TP change)
  - Proprietary Connections
    - Library
    - Port File
    - TCP/IP Port
    - RATL (EAE)

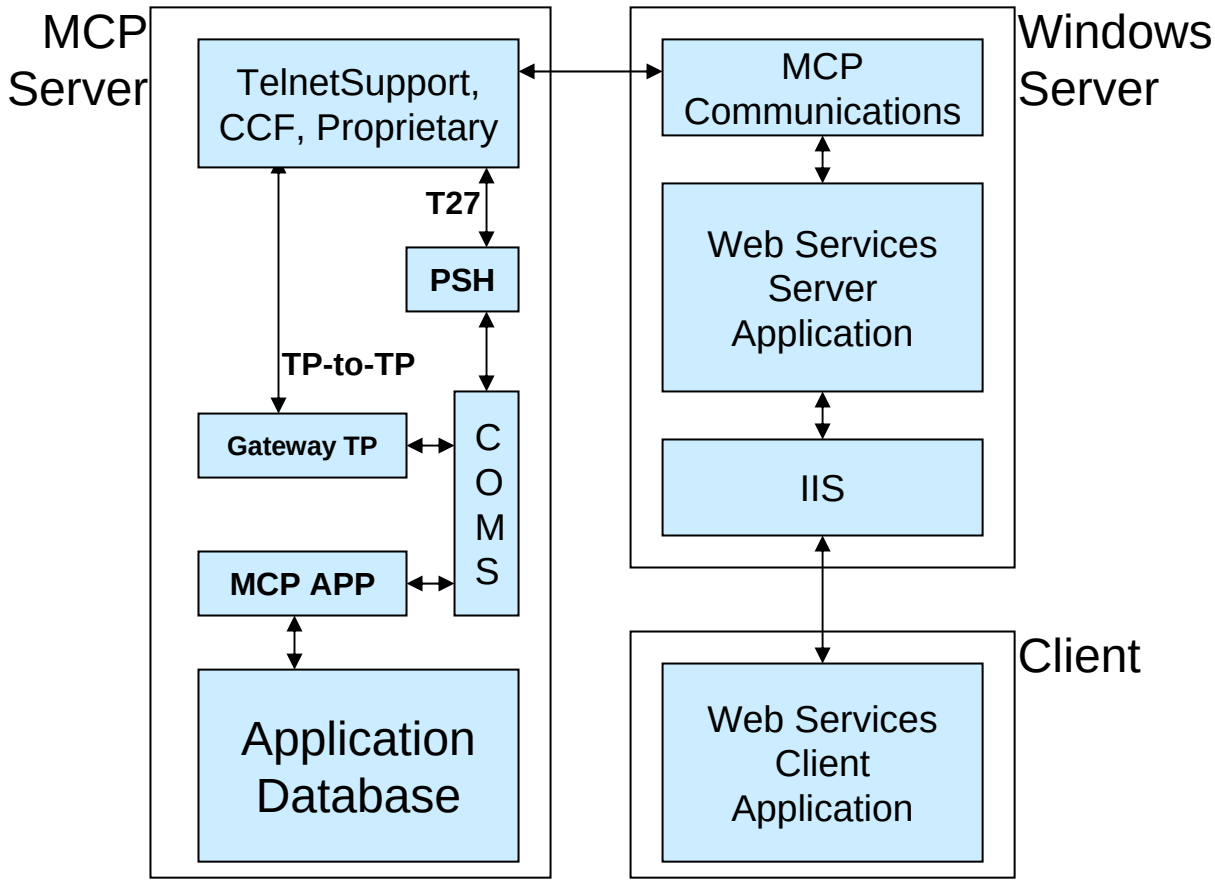
Web Services - MCP

- Web Services Server via a Wintel Gateway
  - Intel hardware
  - Windows OS, IIS
  - Web Services using .NET (most cases)
  - Backend Module to Communicate to MCP
- Gateway to MCP Communications
  - Telnet Terminal Emulation
  - CCF Terminal Emulation
  - Proprietary TCP/IP port/protocol

MGS INC
Computer Business Solutions

Web Services - MCP

- Web Services Server via a Wintel Gateway



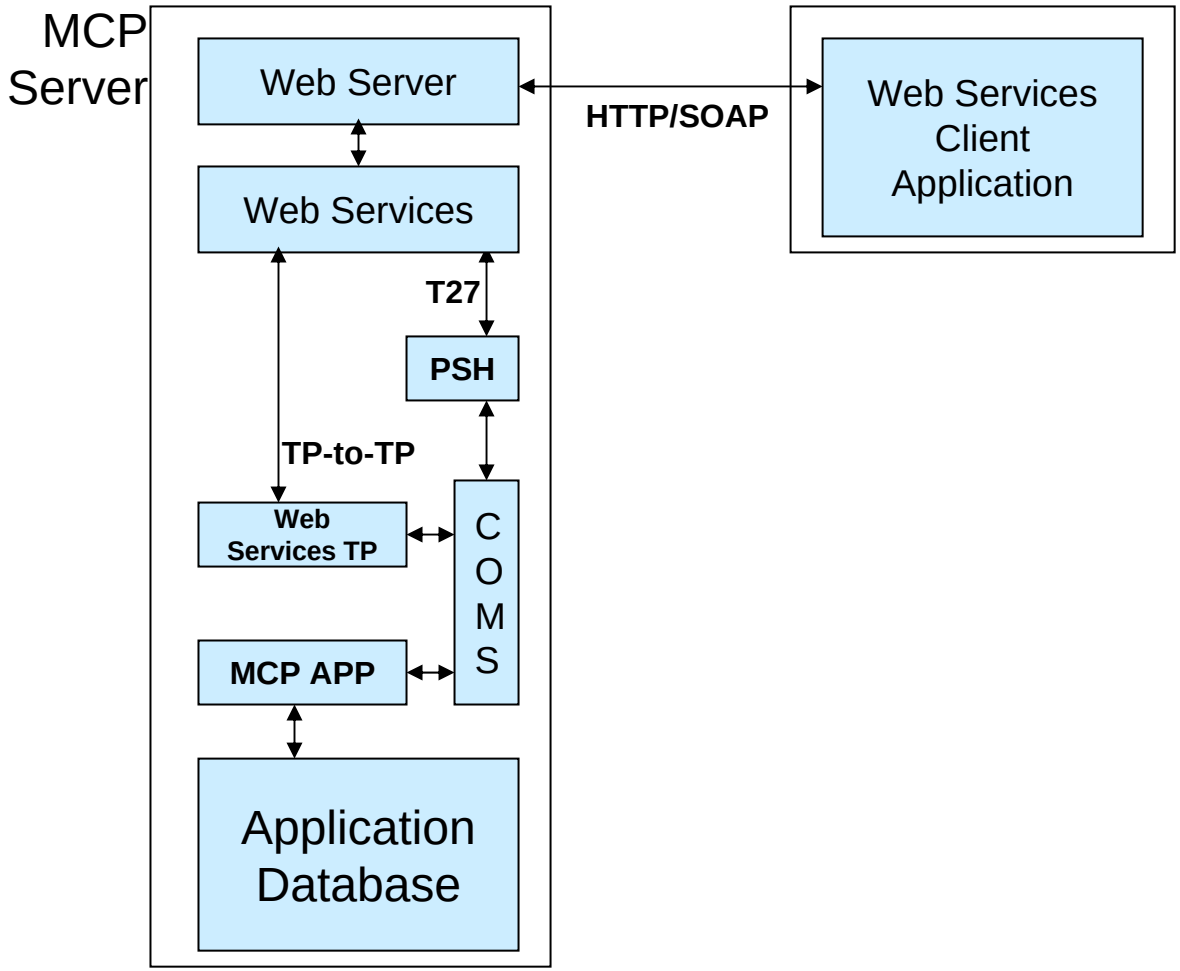
MGS INC
Computer Business Solutions

Web Services - MCP

- MCP Based Web Service
  - Web Service Server runs under MCP control
  - Routes to MCP App via COMS station or COMS TP-to-TP
  - T27 interface (COMS station) requires no existing code changes
  - TP-to-TP is more efficient (no screen scraping) and allows for larger data interchange

Web Services - MCP

- MCP Based Web Service



MGS INC
Computer Business Solutions

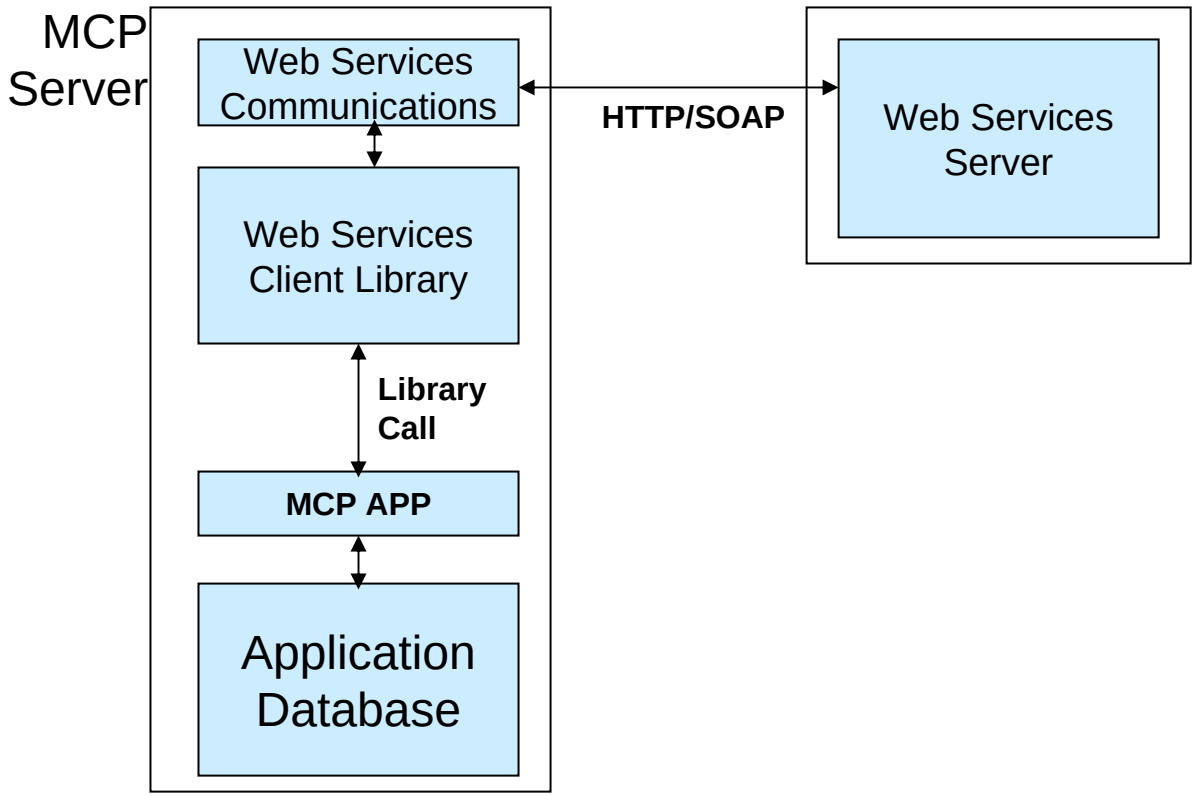
Web Services - MCP

- MCP Based WS Client
  - Allows MCP applications to make a Web Services call on another server
  - Supported by EAE and MGSWeb
  - MCP Application does a simple library call to make the outbound WS Client call

```
01 WEBSERVICE-NAME          PIC X(50).
01 PORT-NAME                PIC X(50).
01 OPERATION-NAME           PIC X(50).
01 RESULT-STRING            PIC X(256).
77 RESULT                   PIC 9(11) BINARY.
.
MOVE <web/http service name> TO WEBSERVICE-NAME.
MOVE <port name> TO PORT-NAME.
MOVE <operation name> TO OPERATION-NAME.
.
<move data to the request record fields>
.
CALL "INVOKE OF WEBSERVICES/LIBRARY"
  USING WEBSERVICE-NAME, PORT-NAME, OPERATION-NAME,
        <request record>,
        <response record>,
        RESULT-STRING
  GIVING RESULT.
```

Web Services - MCP

- MCP Based WS Client



MGS INC
Computer Business Solutions

Web Services - MCP

- MCP Web Services
  - Allow MCP functionality to be easily accessed from the rest of the Enterprise
  - Can be done with minimal/no MCP code changes
  - Extends value of corporate investment in MCP environment
  - Allows MCP functionality to migrate to an Service Oriented Architecture (SOA)
  - Web Services Client interface allows MCP environment to use existing Enterprise SOA functionality

Web Services - Future

- Languages for defining business processes based sequences of individual Web Services
  - **Microsoft/IBM – BPELAWS (Business Processing Execution Language for Web Services)**
  - **Sun – WSCI (Web Services Choreography Interface)**
- Web Services will become a requirement for systems to ***participate*** in the Enterprise just as TCP/IP has become a requirement for systems to ***communicate*** within the Enterprise

MGS INC
Computer Business Solutions

Web Services - Future

“[by using Web Services] developers must consider how to build more modular components, how to share data across otherwise disparate sources , and ultimately, how to create applications out of these components and data sources.”

- Infoworld June 10, 2002

MGS INC
Computer Business Solutions

Additional Questions?

F. Guy Bonney
President

MGS, Inc.
10901 Trade Road, Suite B
Richmond, VA 23236

Voice: (804)379-0230
Fax: (804)379-1299
Email: Guy.Bonney@mgsinc.com
Web: www.mgsinc.com

This presentation is available on our WEB site

MGS INC
Computer Business Solutions

Reference Material

- **WC3 Web Services Architecture Requirements**
  http://www.w3.org/TR/2002/WD-wsa-reqs-20021011
- **WC3 Web Services Description Requirements**
  http://www.w3.org/TR/ws-desc-reqs/
- **Web-Enablement: Setting the Foundation for Web Services, eCommunity Presentation October 10, 2002**
  Wayne Kernochan, Aberdeen Group
- **Understanding XML Web Services, The Web Services Idea.**
  Tim Ewald, Microsoft Corporation
  http://msdn.microsoft.com/webservices/understanding/readme/default.aspx

MGS INC
Computer Business Solutions

UNITE 2006
Technology Conference

Web Services:
The Easy Way to Enterprise-Enable Your MCP Applications and Data

MGS INC
Computer Business Solutions