UNITE 2003
Technology Conference

Turning ClearPath MCP COMS Transactions into Web Services

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MGS, Inc.

Session MCP 4063

4:00pm – 5:00pm

Tuesday, September 23, 2003

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What you will hear today

- Corporate Overview
- Web Services Concepts
- COMS Transaction Concepts
- Turning COMS Transactions into Web Services
  - **Station**
  - **Program**
  - **Database (direct)**
- Business Case

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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**

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MGS Areas of Expertise

- Principals average over 25 years industry experience
- Junior staff - minimum 5 years experience
- 60% of experience is Unisys ClearPath NX/A Series
- Remainder is PC, Windows™, UNIX, C, Delphi, VB, LAN/WAN...

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MGS Software Products

- File Manager for ClearPath MCP/A Series (FMA)
- SightLine™ Performance Analyzer
- SightLine Capacity Manager
- SightLine Workload Analyzer
- HVFAX High Volume Facsimile Delivery System
- Proof of Correctness System (PCS)

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Web Services - Overview

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

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Web Services - Overview

- 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
  - Provides the ability to:
    - Componentize new Enterprise business functions
    - Encapsulate existing business functions for easier access

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Web Services - Overview

- Supported by software IDEs
  - Web Services Client object support
    - Discovery of service
    - Automatic creation of Web Services client objects
  - Web Services Server object support
    - Description file generation
    - Directory update
    - Server program code
  - Included as part of the application framework
    - Microsoft .NET
    - Sun Microsystems J2EE

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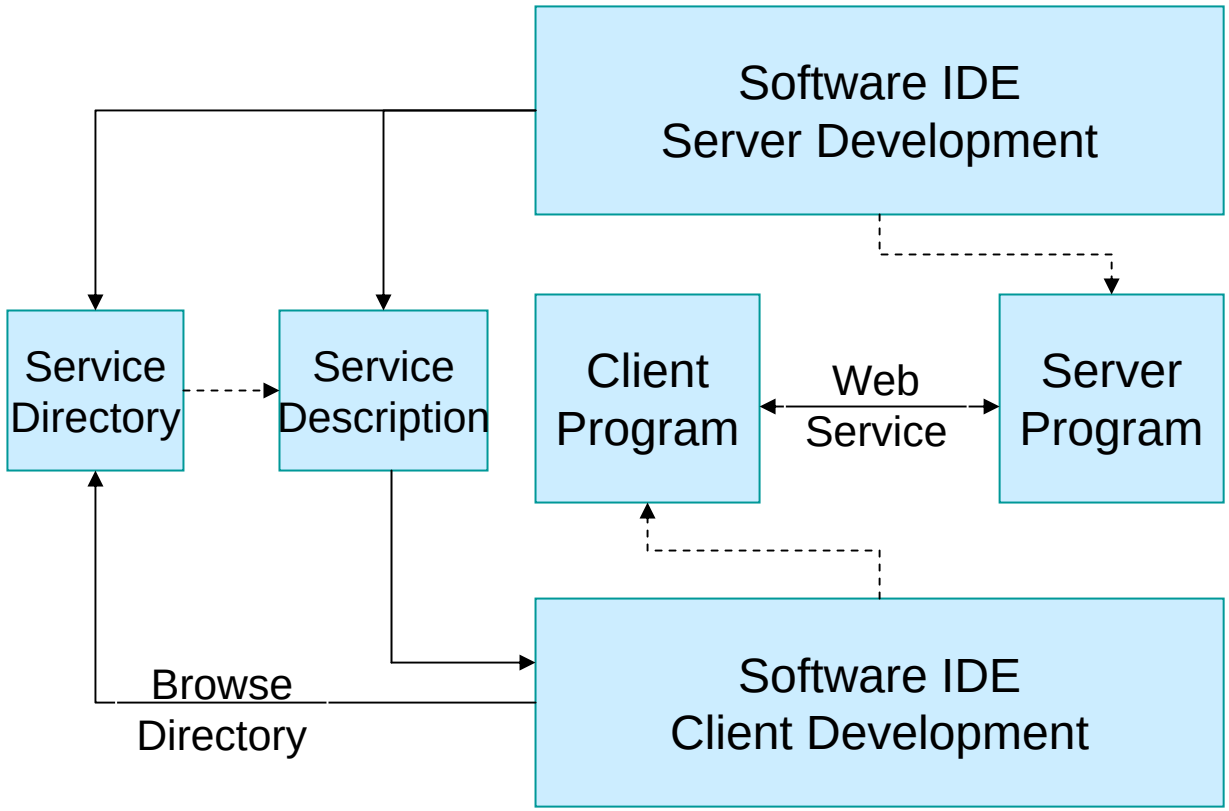
Web Services - Overview



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Web Services- WSDL & UDDI

- 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

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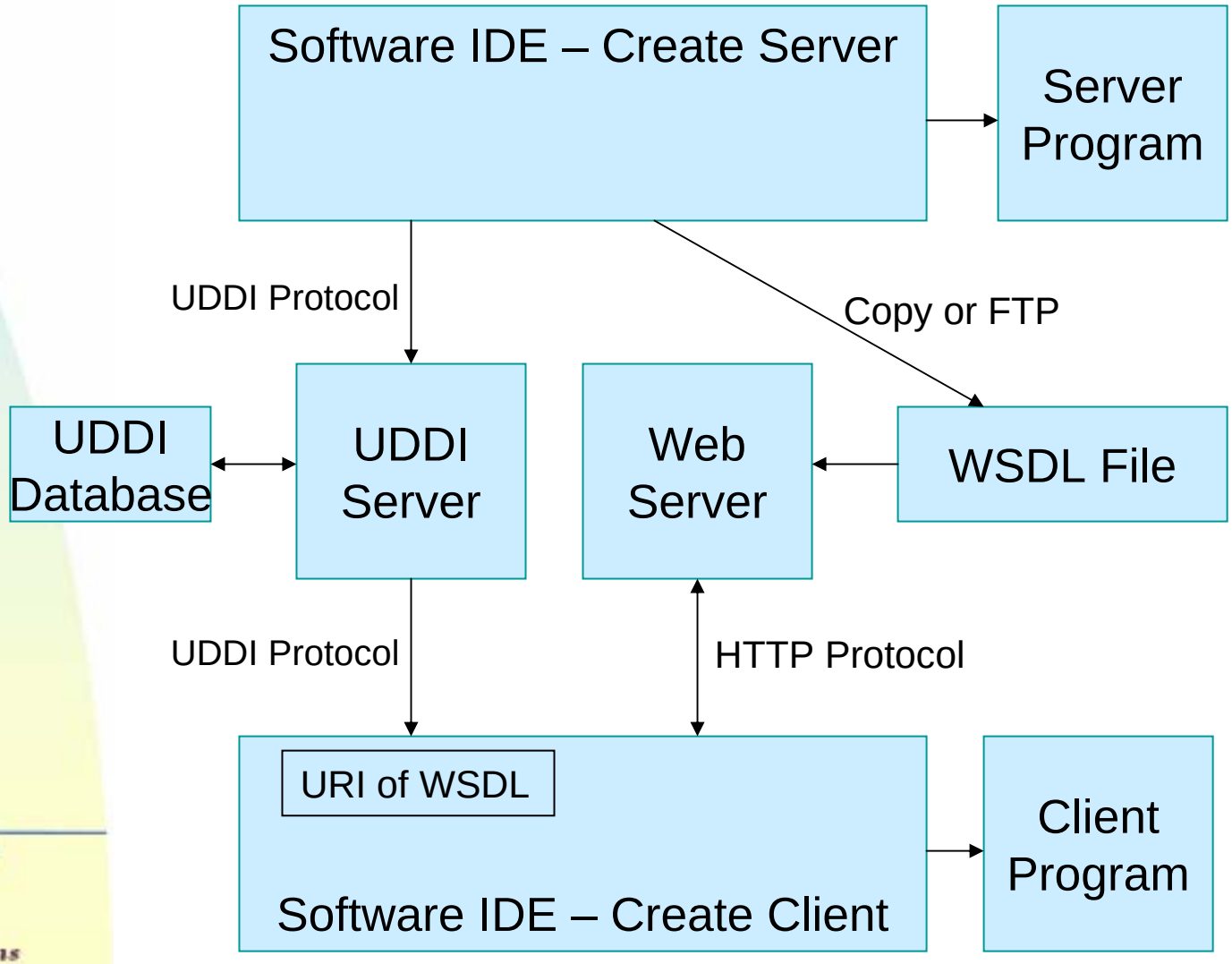
Web Services- WSDL & UDDI



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Web Services- WSDL & UDDI

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="Output_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://cp3mcp/COMSWebServices/" />
    </port>
</service>
```

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Web Services – SOAP

- 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

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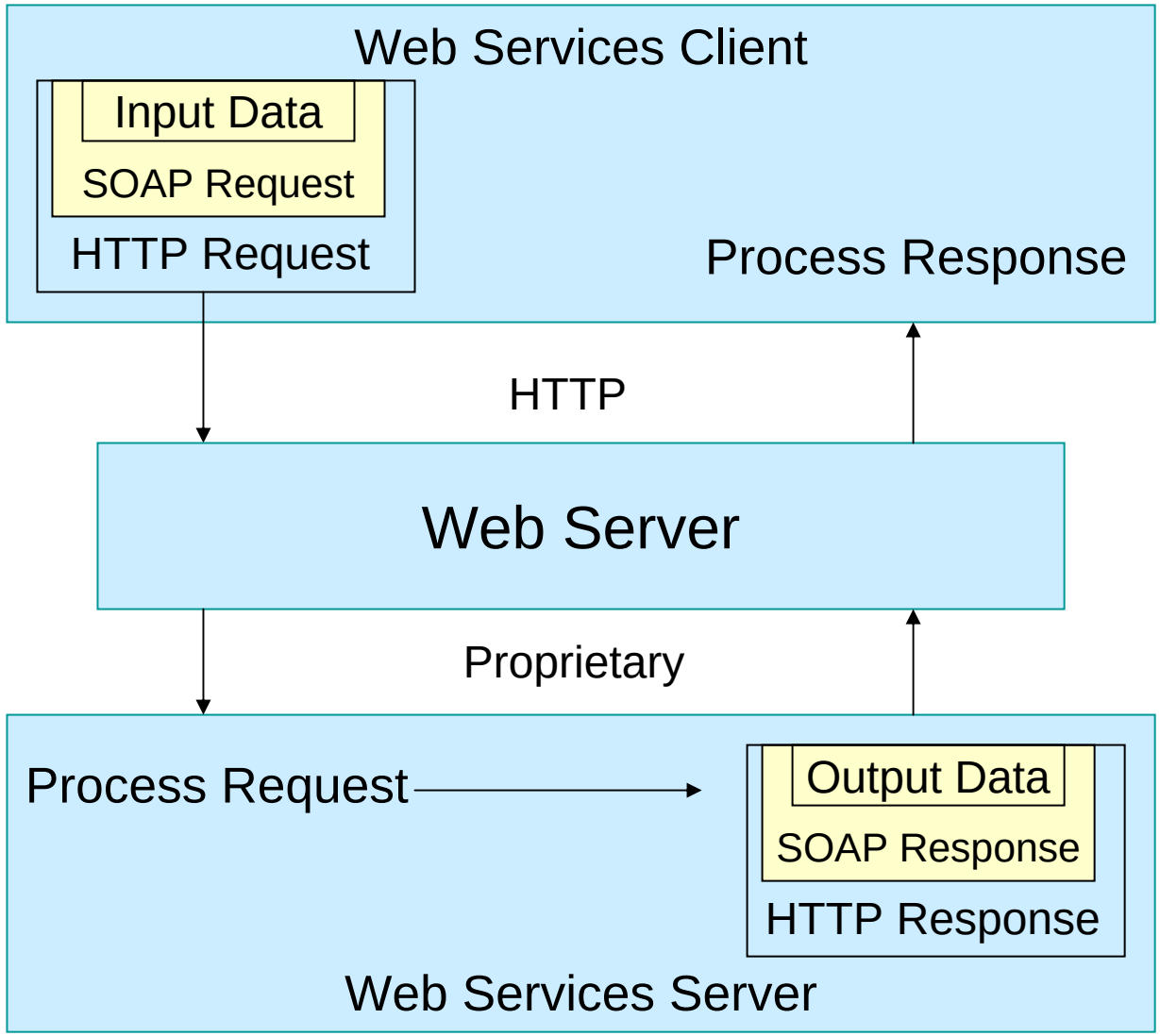
Web Services – SOAP

Indicates XML Encoding



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Web Services – SOAP

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

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Web Services – Security

- Security Considerations
  - Can use HTTPS (SSL) for authentication and encryption
  - SOAP security
    - assumes transaction is from a trusted source
    - leaves transaction security to the application
    - possible use of future XML security standards
  - Application Security
    - part of each transaction
    - part of a multi transaction dialog

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COMS Transaction Overview

- Transaction Server for ClearPath MCP (COMS)
  - Transaction manager for the MCP environment
  - All transactions ultimately end here
- Two ways to submit transactions to COMS
  - Station input
    - Protocol Specific Handler (PSH)
    - Pseudo-station
  - Programmatic input
    - TP-to-TP

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COMS Transaction Overview

- Typical Station Transaction
  - End User sends input message to COMS via standard transport
  - COMS routes message to Application Transaction Processor (TP)
  - TP accesses DMSII database, formulates response
  - COMS routes response to End User via input transport

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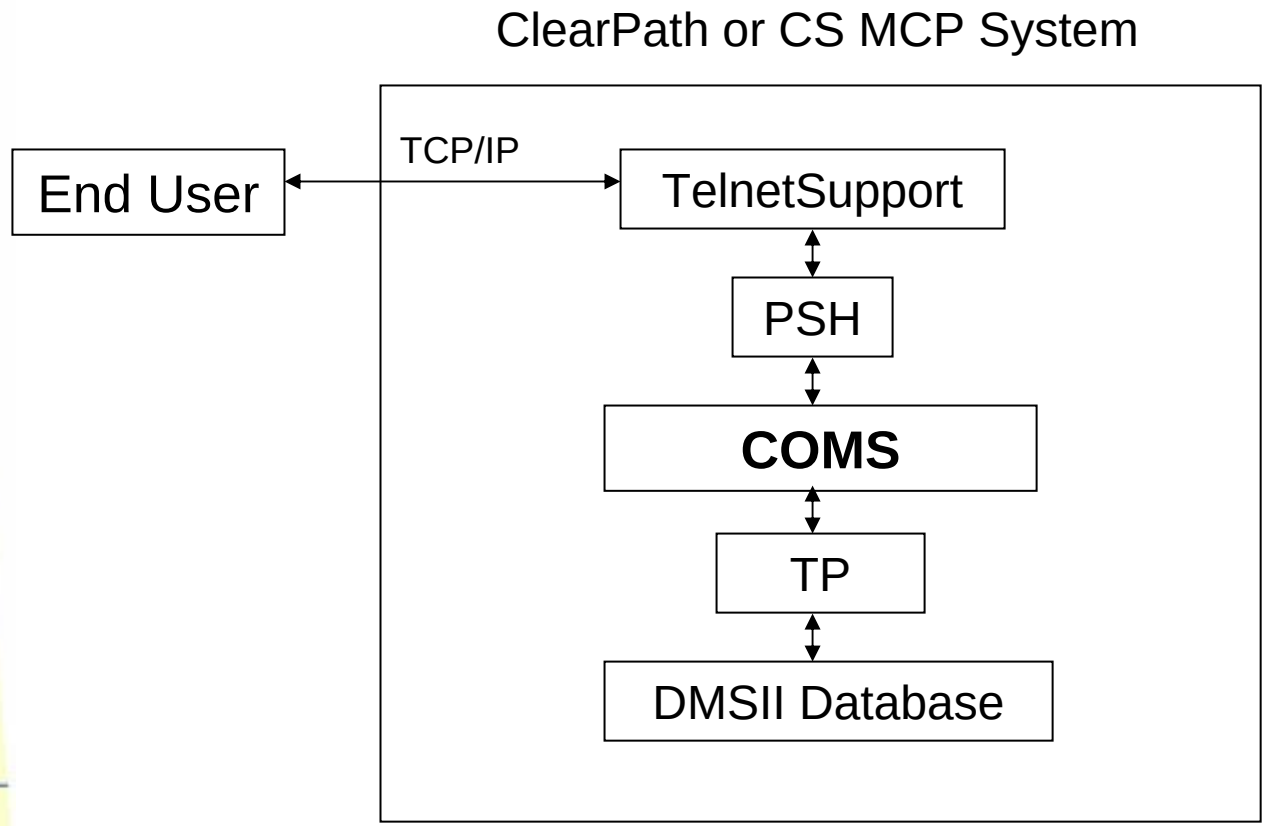
COMS Transaction Overview

- Typical Station Transaction



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COMS Transaction Overview

- Typical Programmatic Transaction
  - External Application sends message to companion application running as a COMS TP
  - TP uses COMS to send a message to another COMS TP
  - Second TP accesses DMSII database, formulates response
  - Response sent back to first TP, which responds to External App

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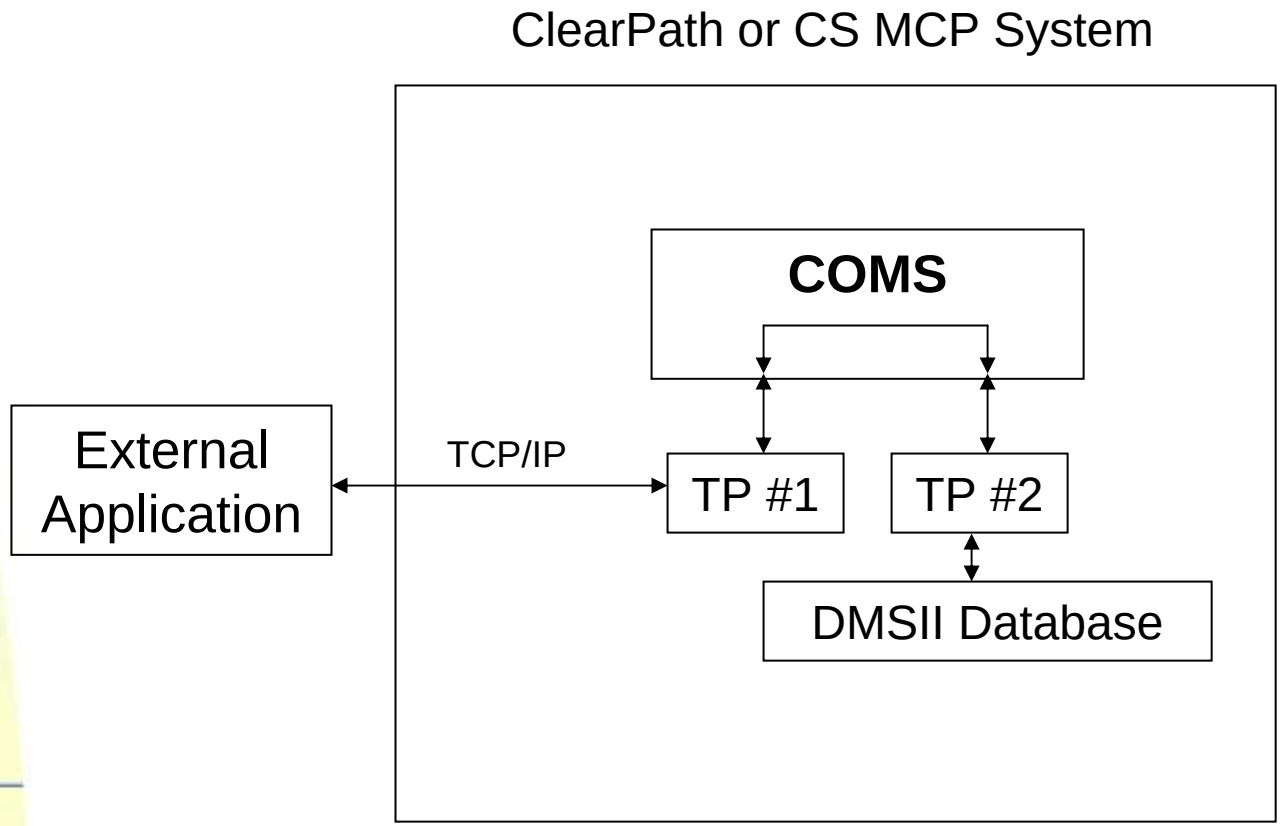
COMS Transaction Overview

- Typical Programmatic Transaction



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Turning a COMS Transaction into a Web Service

- MGS Web Services allow existing COMS transactions to be accessed via Web Services
  - Host based Web Services server
  - Web Services defined and deployed from a Windows based Web Services utility
  - Configuration and diagnostics controlled from the same Windows Web Services utility
  - Automatically creates browser access to the new Web Services

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Turning a COMS Transaction into a Web Service

- There are three ways for MGS Web Services to turn a transaction into a Web Service:
  - Station Emulation
    - **Screen-scraping technology**
    - **Totally transparent to application**
  - Program
    - **Based on TP-to-TP efficiency**
    - **Requires minor application changes**
  - Database
    - **Direct access to DMSII data**
    - **No application changes**
    - **Read-only**

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Turning a COMS Transaction into a Web Service

- The process to create Web Service enabled MCP functionality is done in several phases
  - Web Service Definition
  - Web Service Deployment
  - Client Application Development
  - Running Client Application

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Turning a COMS Transaction into a Web Service

- Web Service Definition
  - Station Emulation
    - Capture the COMS transaction using Unisys SOMS
  - Program
    - Define the format of the TP-to-TP request and response
  - Database
    - Select the DMSII dataset

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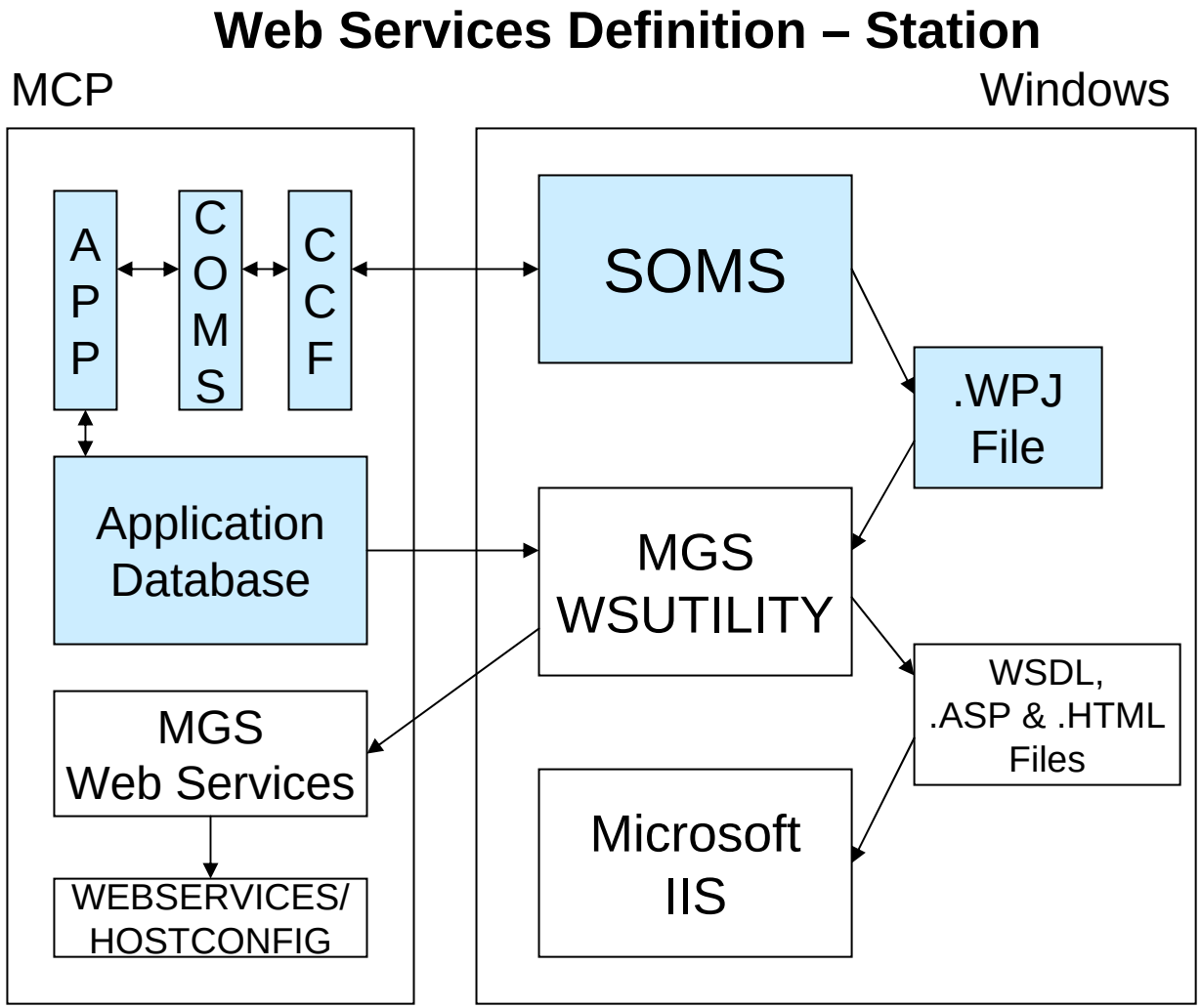
Turning a COMS Transaction into a Web Service



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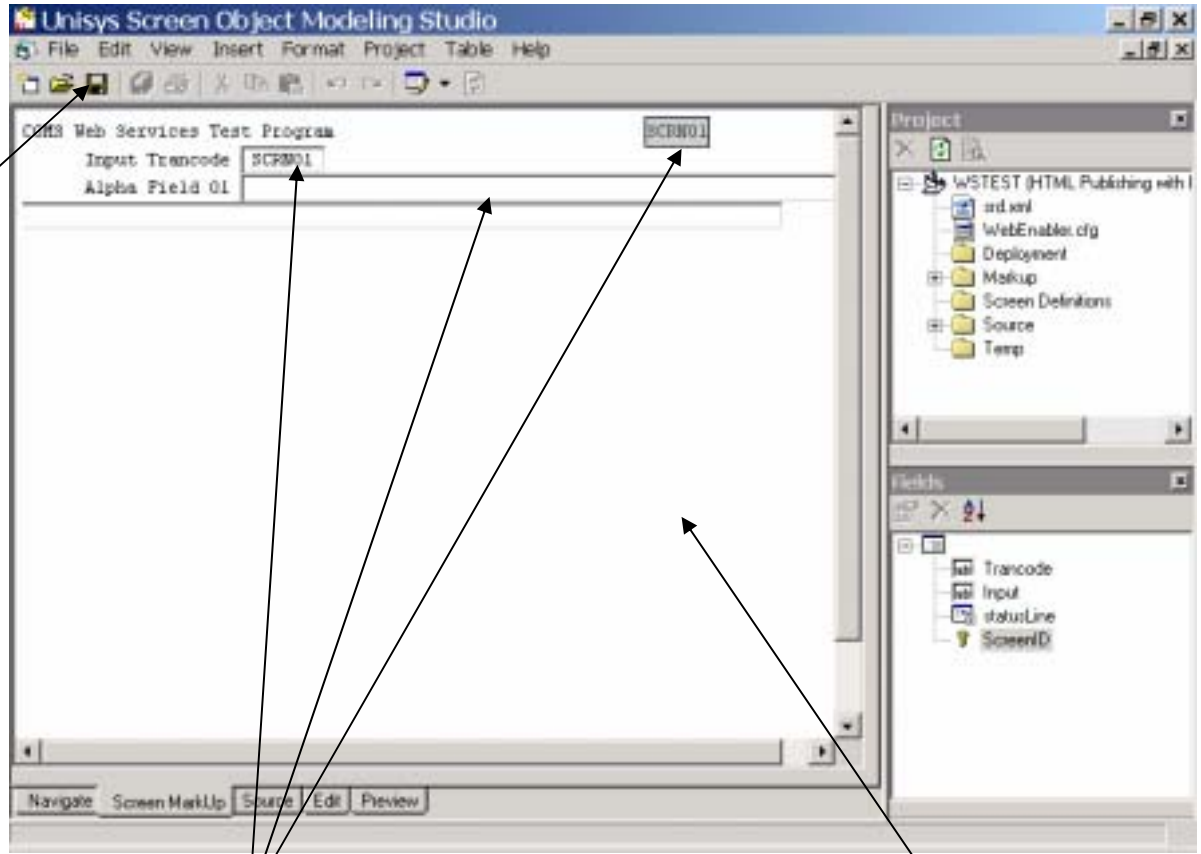
Turning a COMS Transaction into a Web Service

Web Services Definition – Station



3. Save SOMS Project

2. Map data fields on screen

1. Navigate to screen using terminal emulation area

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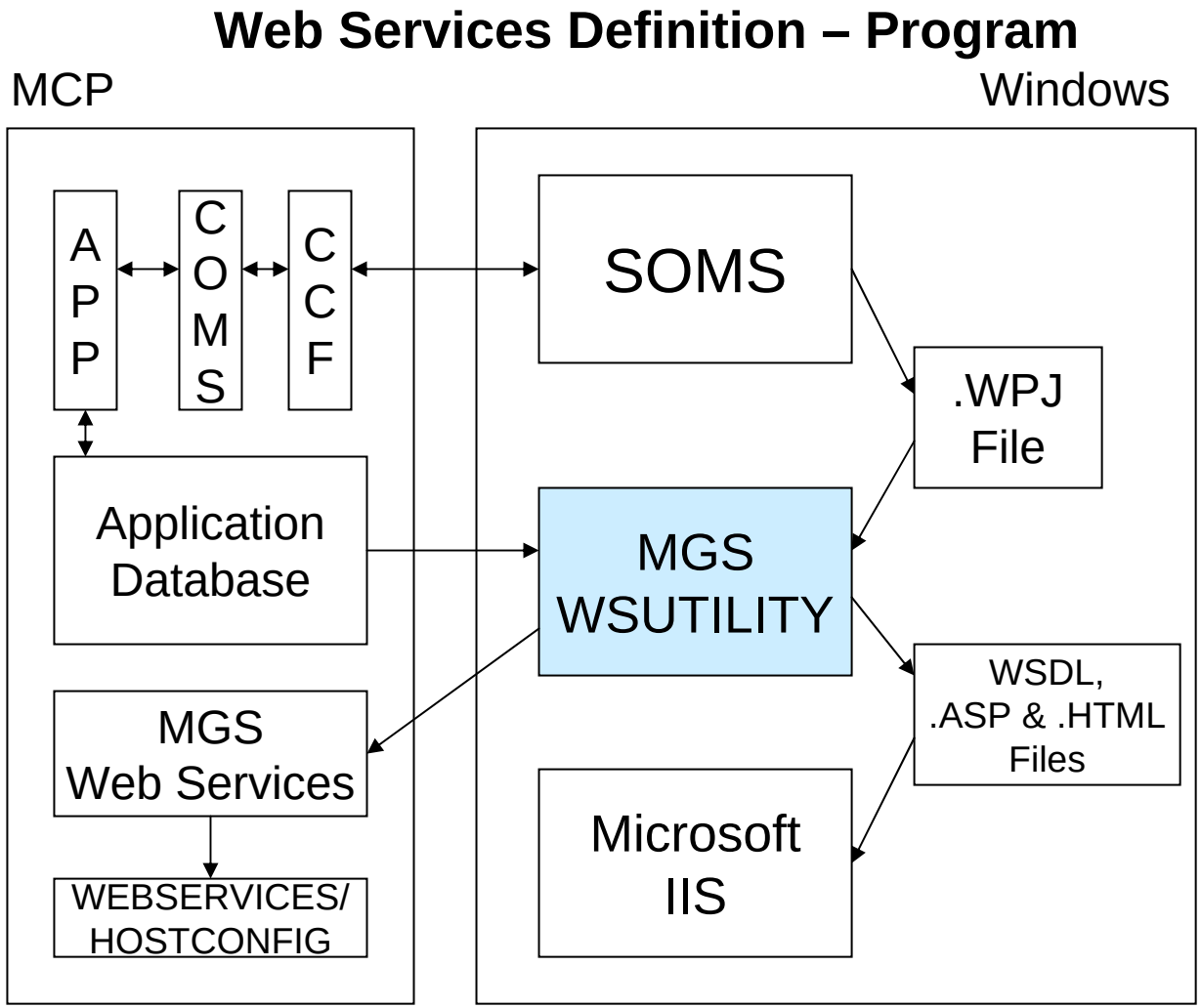
Turning a COMS Transaction into a Web Service



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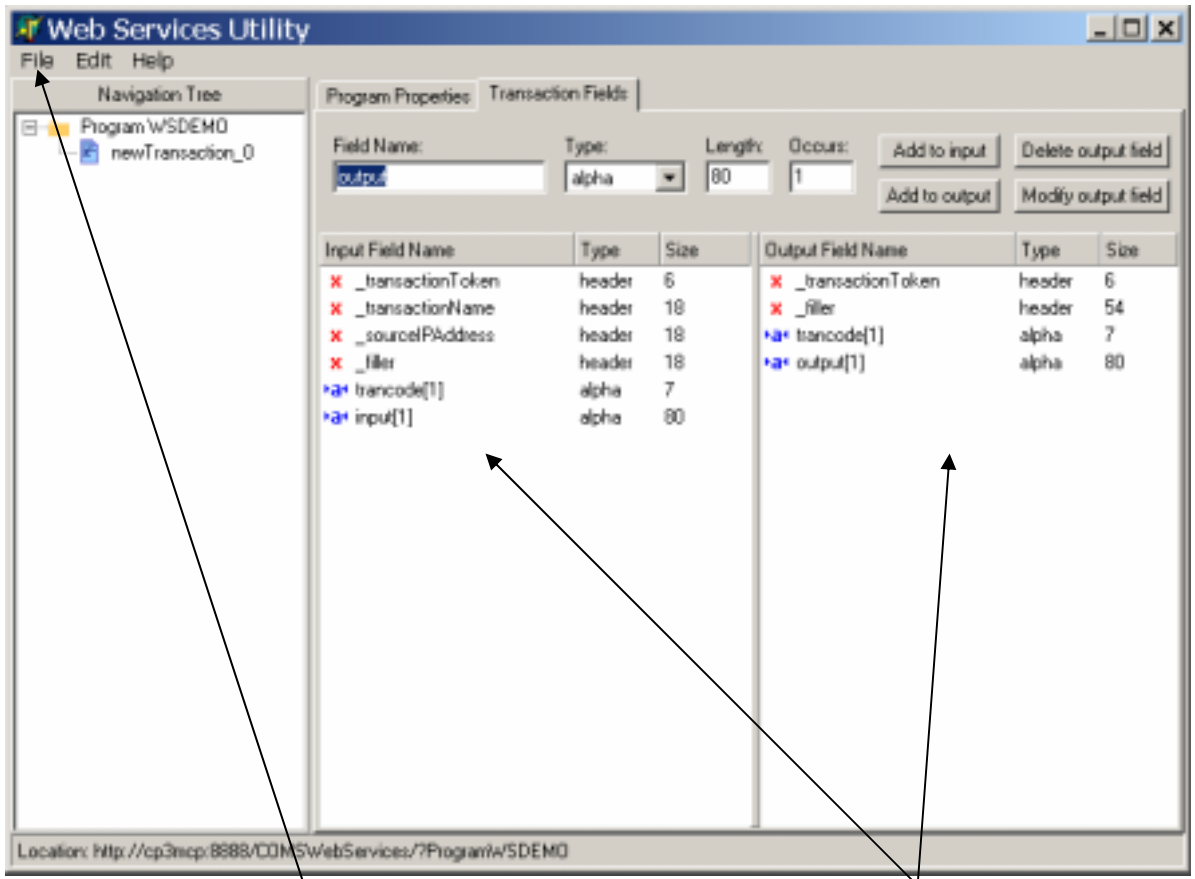
Turning a COMS Transaction into a Web Service

Web Services Definition – Program



2. Save program definition

1. Define input and output message formats

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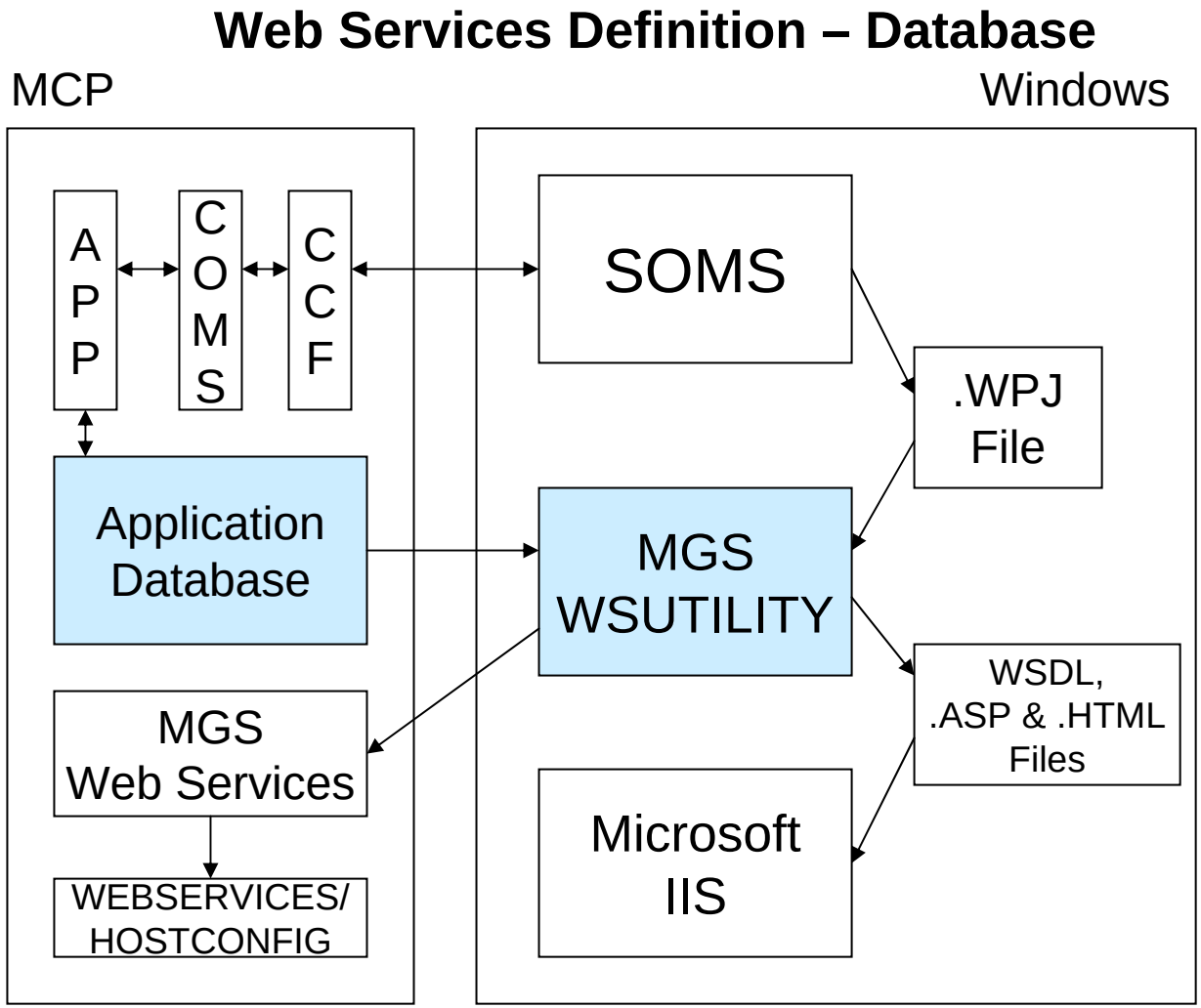
Turning a COMS Transaction into a Web Service



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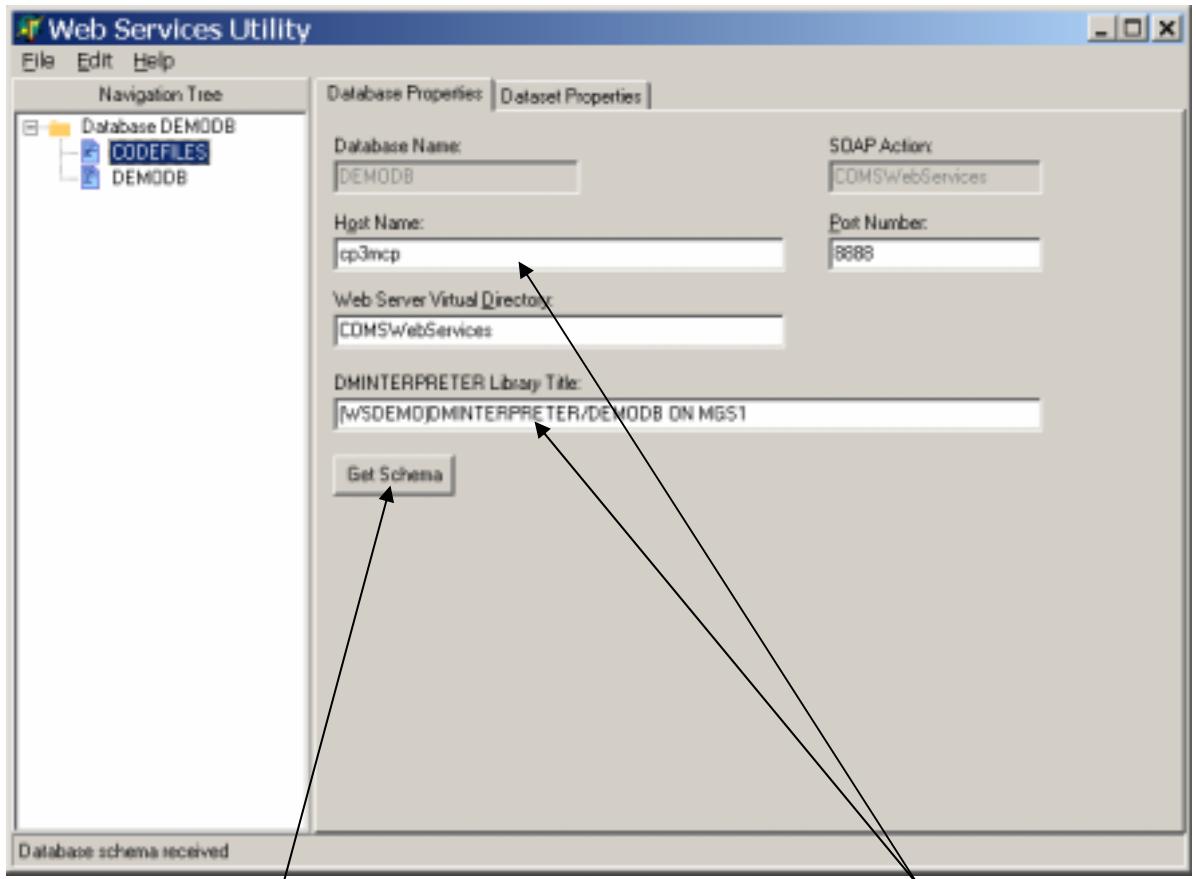
Turning a COMS Transaction into a Web Service

Web Services Definition – Database



2. Download schema

1. Identify database location

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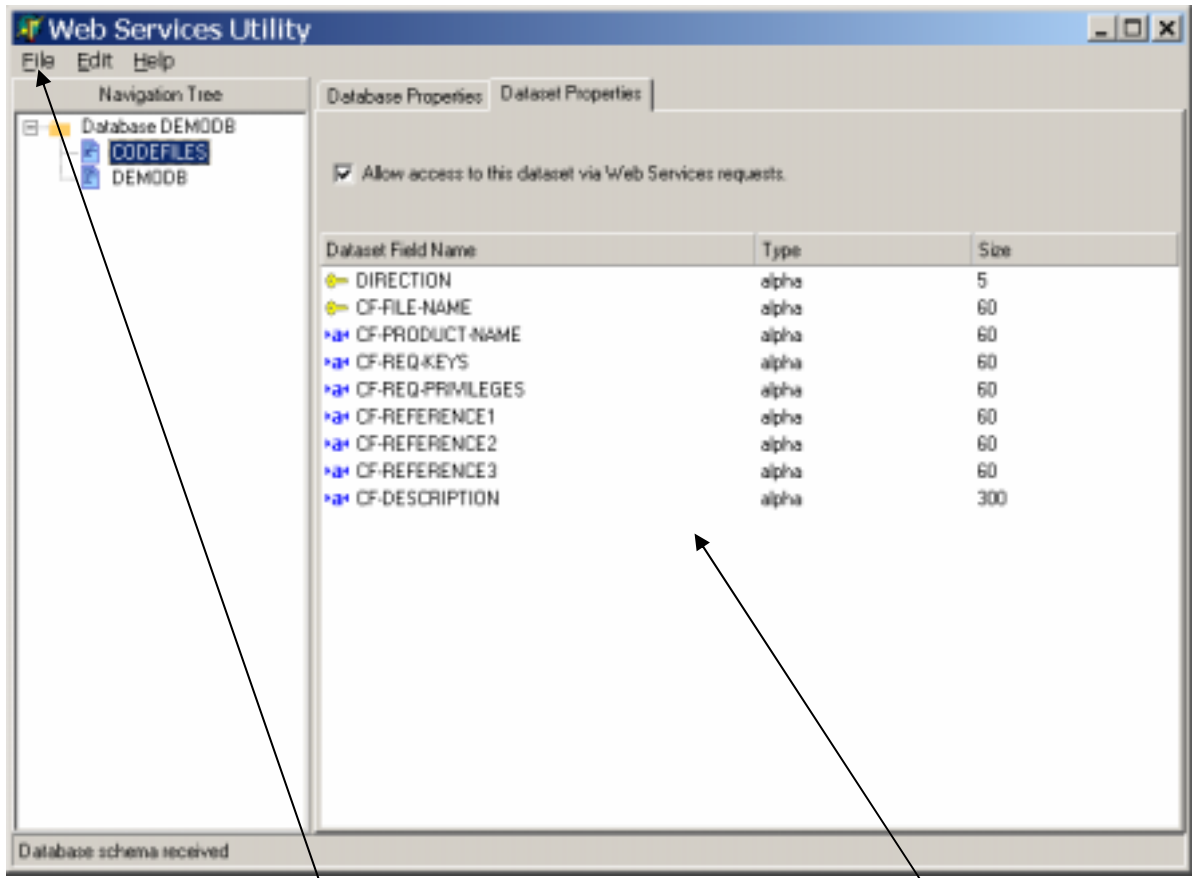
Turning a COMS Transaction into a Web Service

Web Services Definition – Database



4. Save Database definition

3. List of available data fields

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Turning a COMS Transaction into a Web Service

- Web Services Deployment
  - Deploy host configuration
  - Deploy WSDL to web server of choice
  - [optional] Deploy ASP/HTML files to web server of choice

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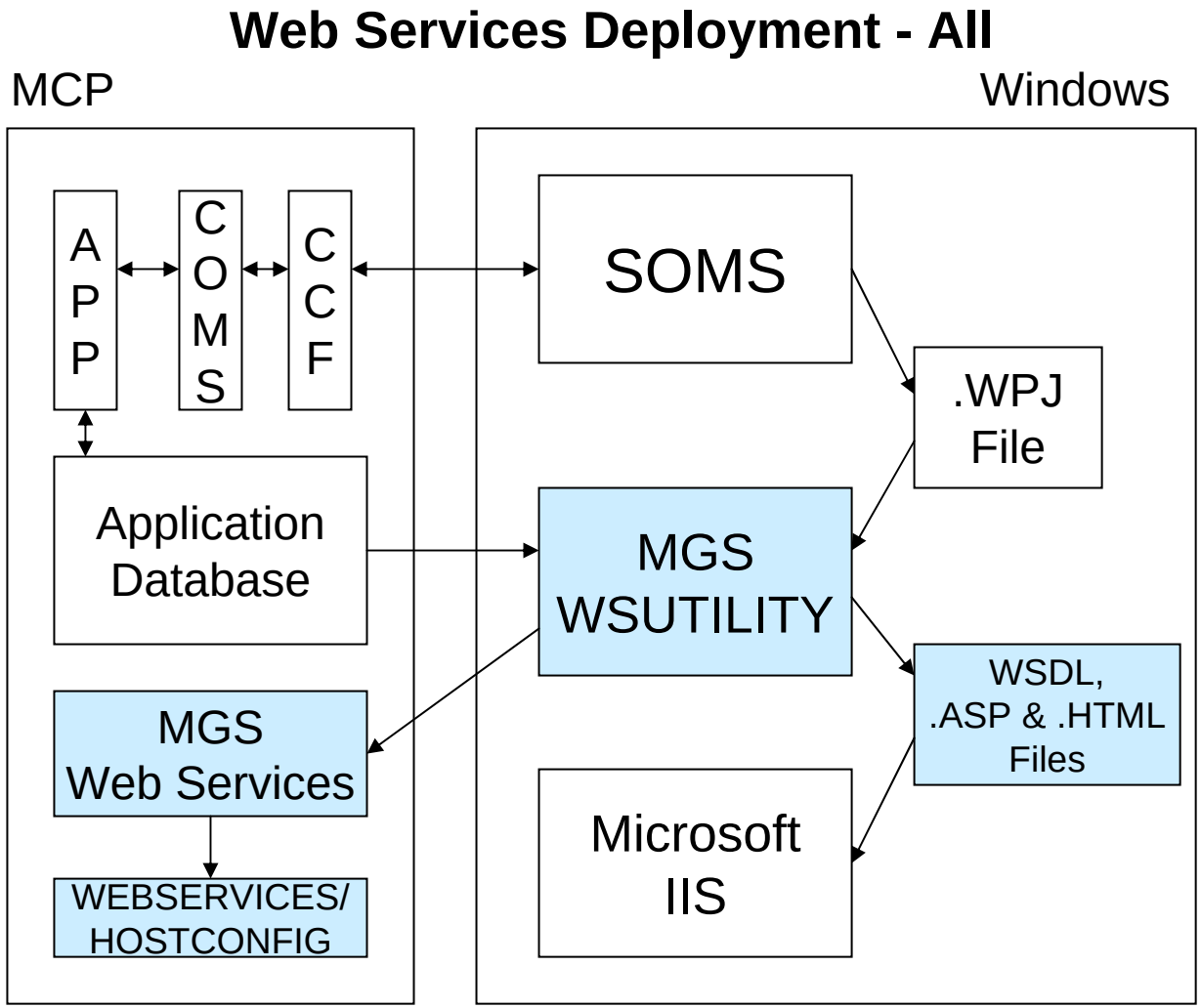
Turning a COMS Transaction into a Web Service



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Turning a COMS Transaction into a Web Service

- Client Application Development
  - Load WSDL
  - Create COMS transaction objects
  - Send Web Services request
  - Receive Web Services response

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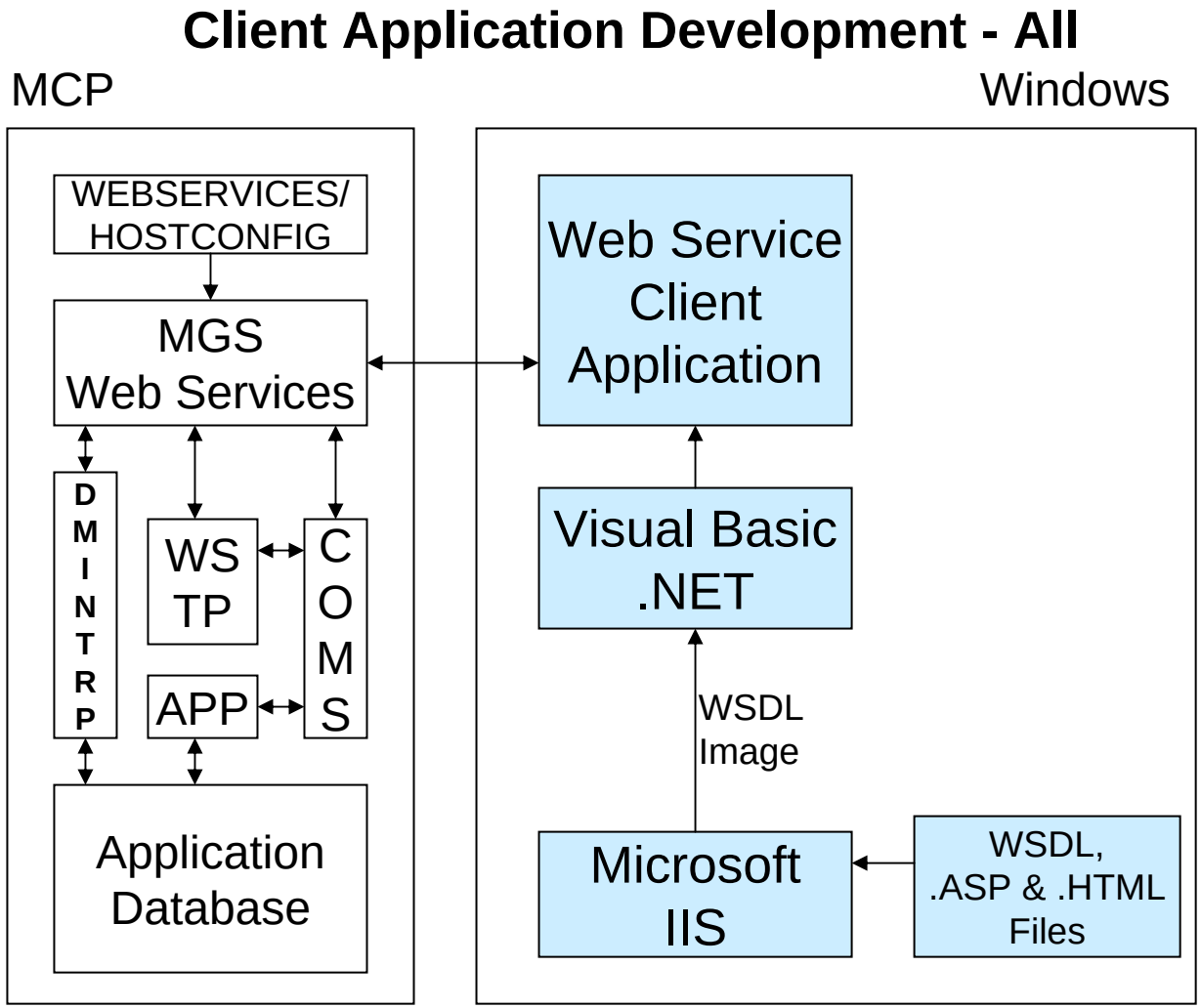
Turning a COMS Transaction into a Web Service



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Turning a COMS Transaction into a Web Service

- Example Visual Basic Code

```
Private Sub Button1_Click(ByVal sender As System.Object,
                          ByVal e As System.EventArgs
                         )Handles Button1.Click

    ' declare web-service, send and receive objects
    Dim MCPWS As New WebReference1.COMSWebServices()
    Dim Send As New WebReference1.WSTEST_ScreenOneType()
    Dim Receive As WebReference1.WSTEST_ScreenOneResponseType

    ' set up the input parameters
    Send.trancode = “SCRN01"
    Send.Input = TextBox1.Text

    ' execute the web service
    Receive = MCPWS.WSTEST_ScreenOne(Send)

    ' display the output field
    TextBox1.Text = Receive.Output

End Sub
```

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Turning a COMS Transaction into a Web Service

- Running the Client Application
  - Accesses objects for the different MCP Web Services
  - Different data paths
    - Station
    - Program
    - Database

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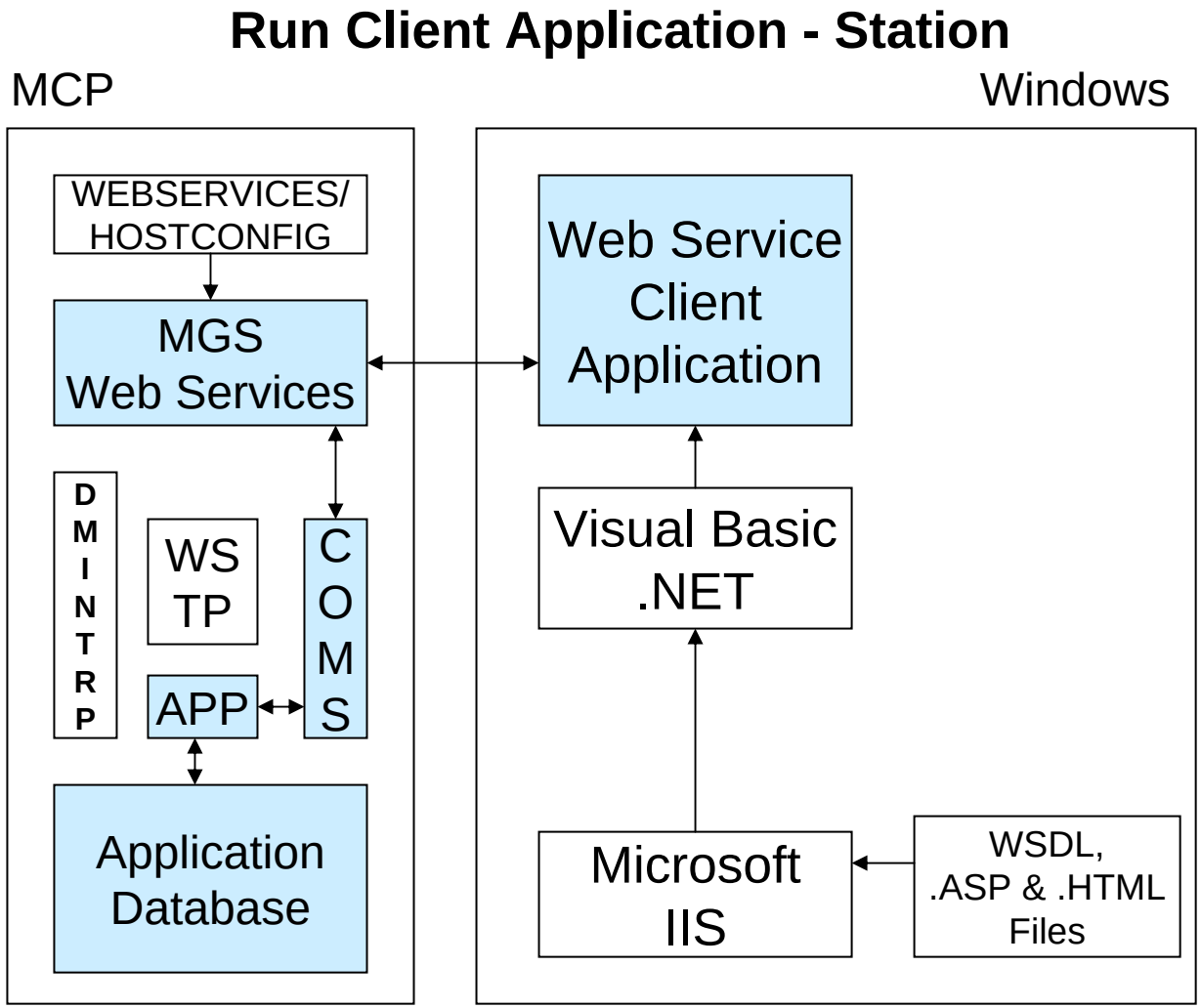
Turning a COMS Transaction into a Web Service



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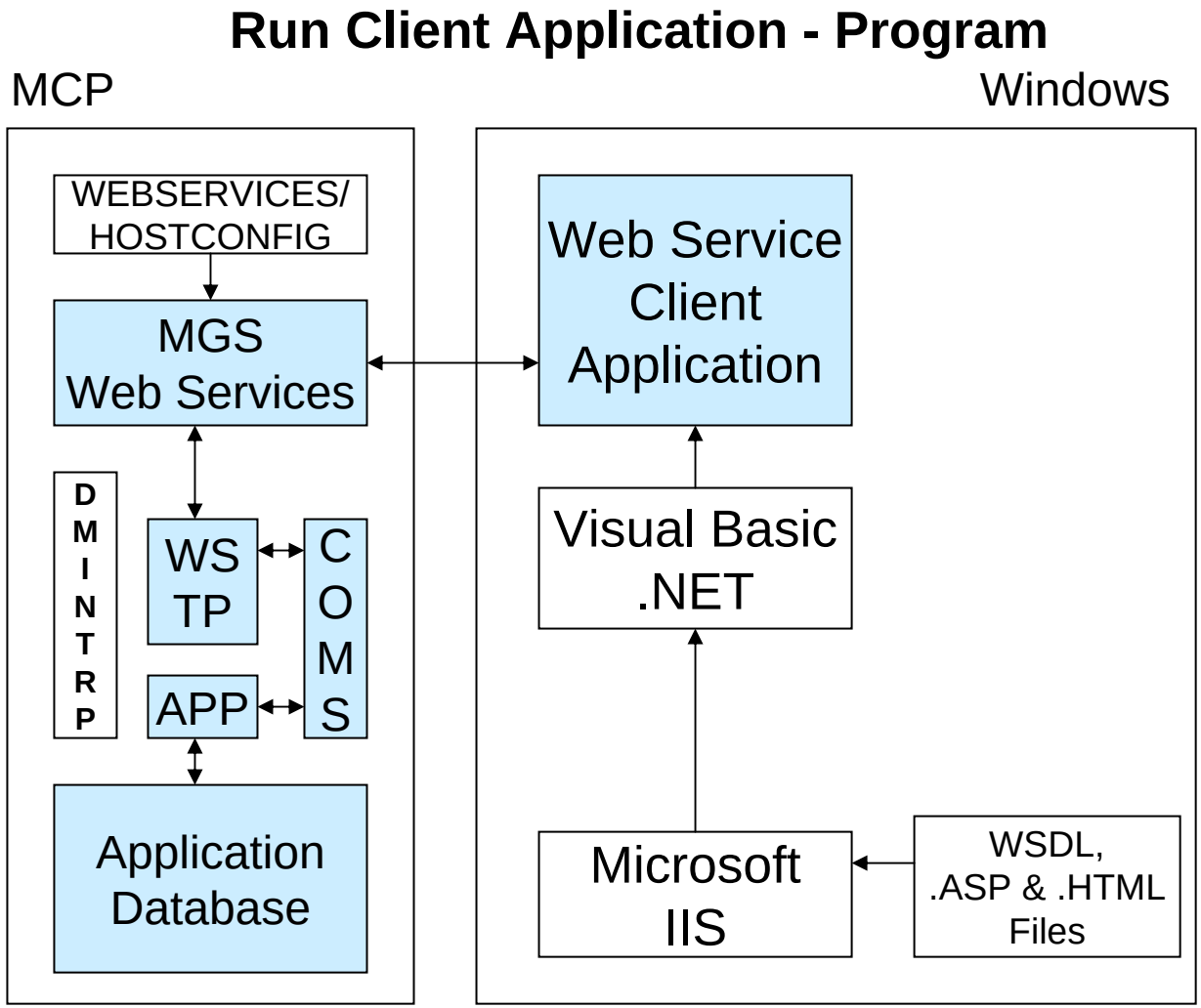

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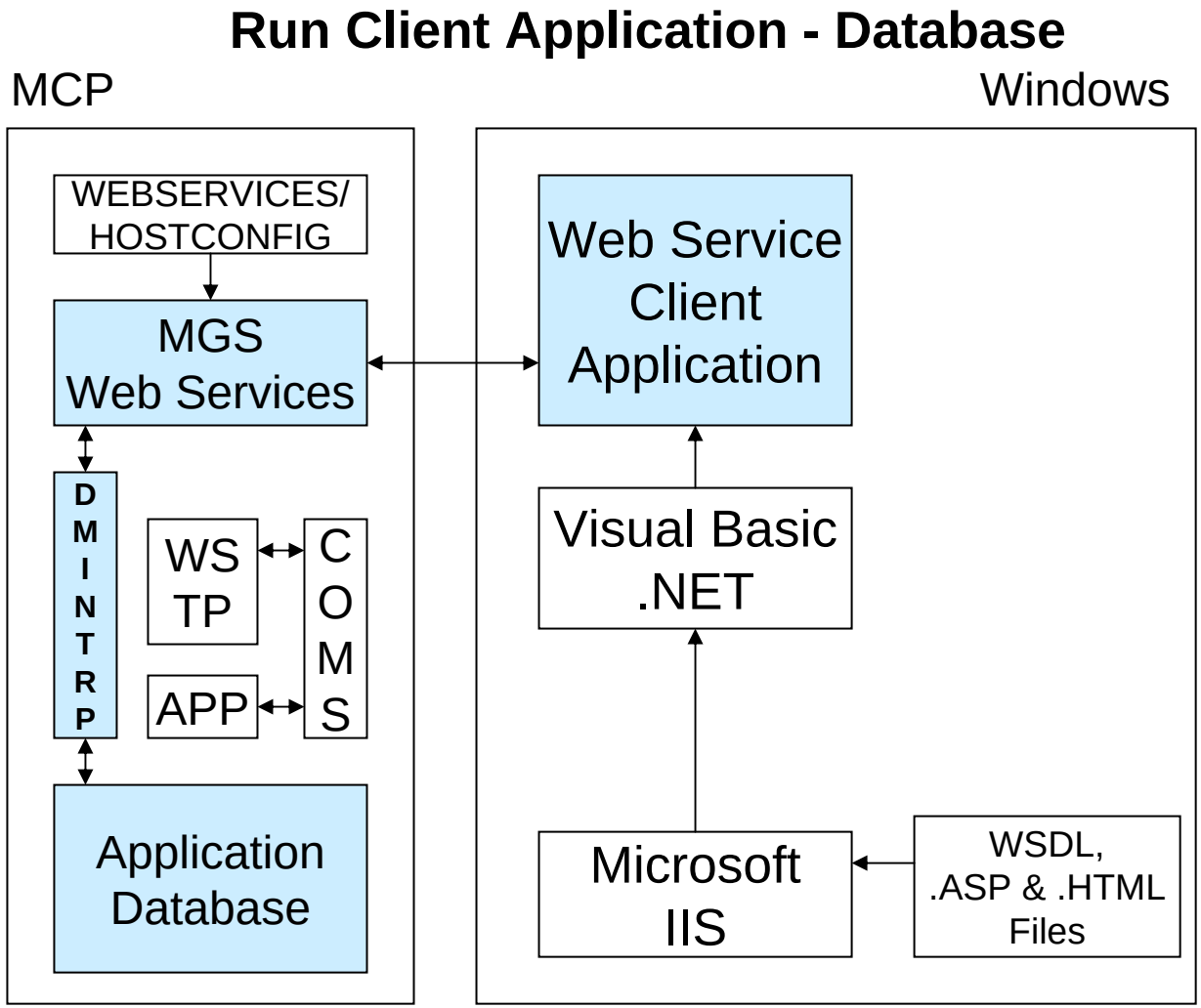
Turning a COMS Transaction into a Web Service



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Turning a COMS Transaction into a Web Service

- Support for Web Transaction Server for ClearPath MCP (Atlas)
  - MGS Web Services can process Web Service requests presented to the Atlas Web Server
  - MGS Web Services can also process Web Service requests directly

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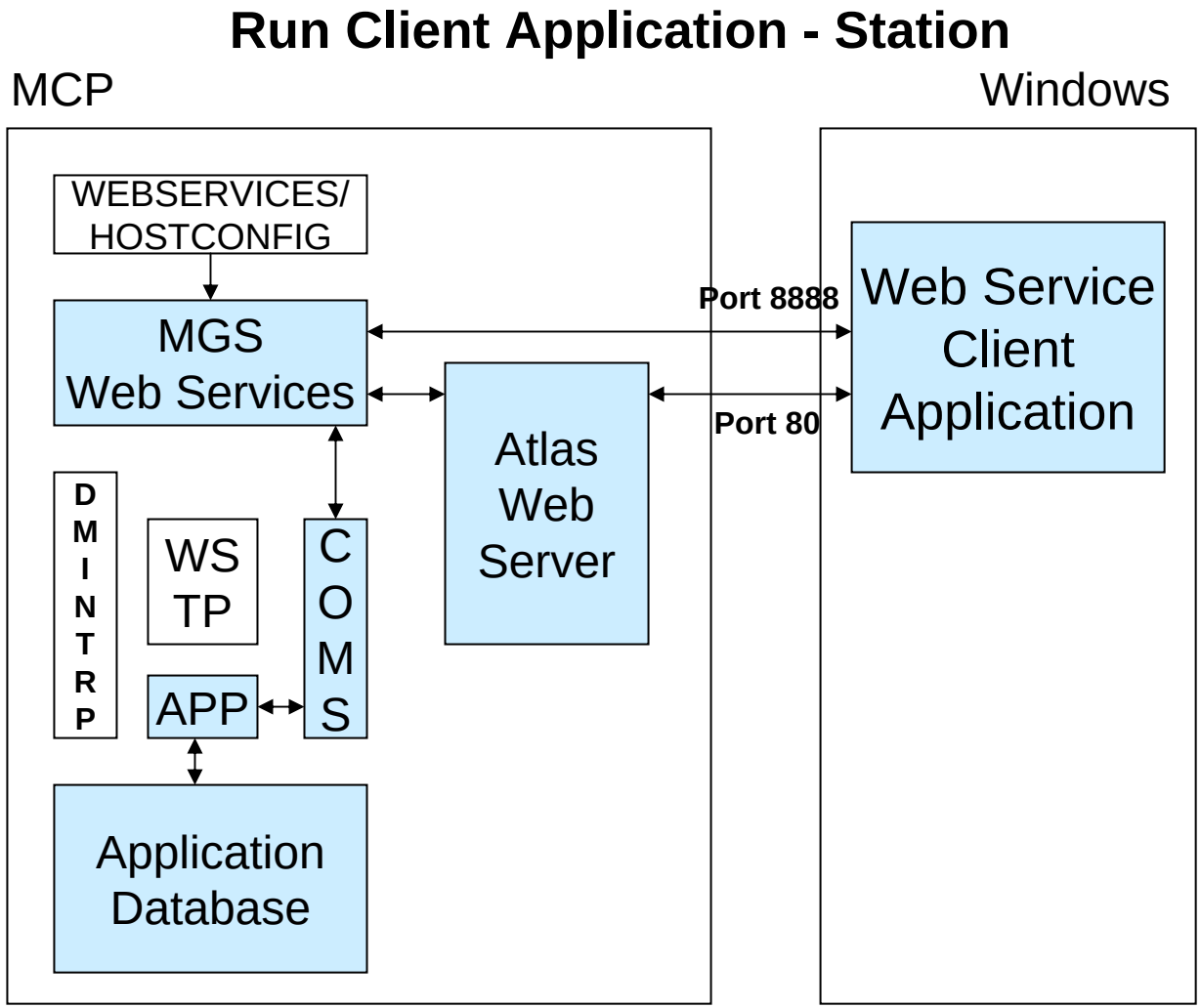
Turning a COMS Transaction into a Web Service



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Turning a COMS Transaction into a Web Service

- Get additional value by using Web Services to Serve up data for browser transactions
  - Run browser to access generated ASP/HTML for demo Web Service
  - Run FrontPage or DreamWeaver to customize the generated HTML

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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**

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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**

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Web Services- Business Case

- Supported by software IDEs like .NET and J2EE
  - **Creates Web Services client objects**
  - **Web Services Server object support for:**
    - **WSDL generation**
    - **UDDI update**
    - **WS Server program**
- Abstracts business functionality
  - **Creates technology independent functionality**
  - **Indirect reference to service, trivial to re-locate the business function**
  - **Improved scalability and ability to re-host**

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Web Services- Business Case

- Easily 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**
- Organize IS services
  - **Implement functionality shared between dissimilar systems**
  - **Provide well defined interfaces between business units**

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Additional Questions?

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