Data Services Gateway (DSG)

Kevin Boham and Michael Johnston - IBM

2006 B2B Customer Conference

B2B - Catch the Next Wave

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The Revenue Train

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Objectives

- Present how the Data Services Gateway (DSG) has integrated the WebSphere B2B products into its environment in support of IBM's Global Logistics organization
  - Define the role and function of the Data Services Gateway
  - Illustrate a couple business examples using the DSG
  - Architectural overview of the Data Services Gateway
    - Describe IBM's technical implementation of the DSG
  - Describe why the DSG is different than most applications
  - Summarize the business value of the DSG

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Agenda

- The DSG concept
  - Kevin Boham
- Business processes and messages
  - Michael Johnston
- DSG architecture overview
  - Kevin Boham
- Q&A

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What is the Data Services Gateway?

- The Data Services Gateway is a middleware service which provides "any to any" connectivity between IBM's internal distribution systems (SAP and Legacy), data warehouses, freight carriers/forwarders and government agencies (Customs) around the world.
  - Often referred to as an isolation layer

- The DSG is used to support IBM’s business activity
  - The DSG is like any other IBM customer except it supports IBM’s Global Logistics Organization.

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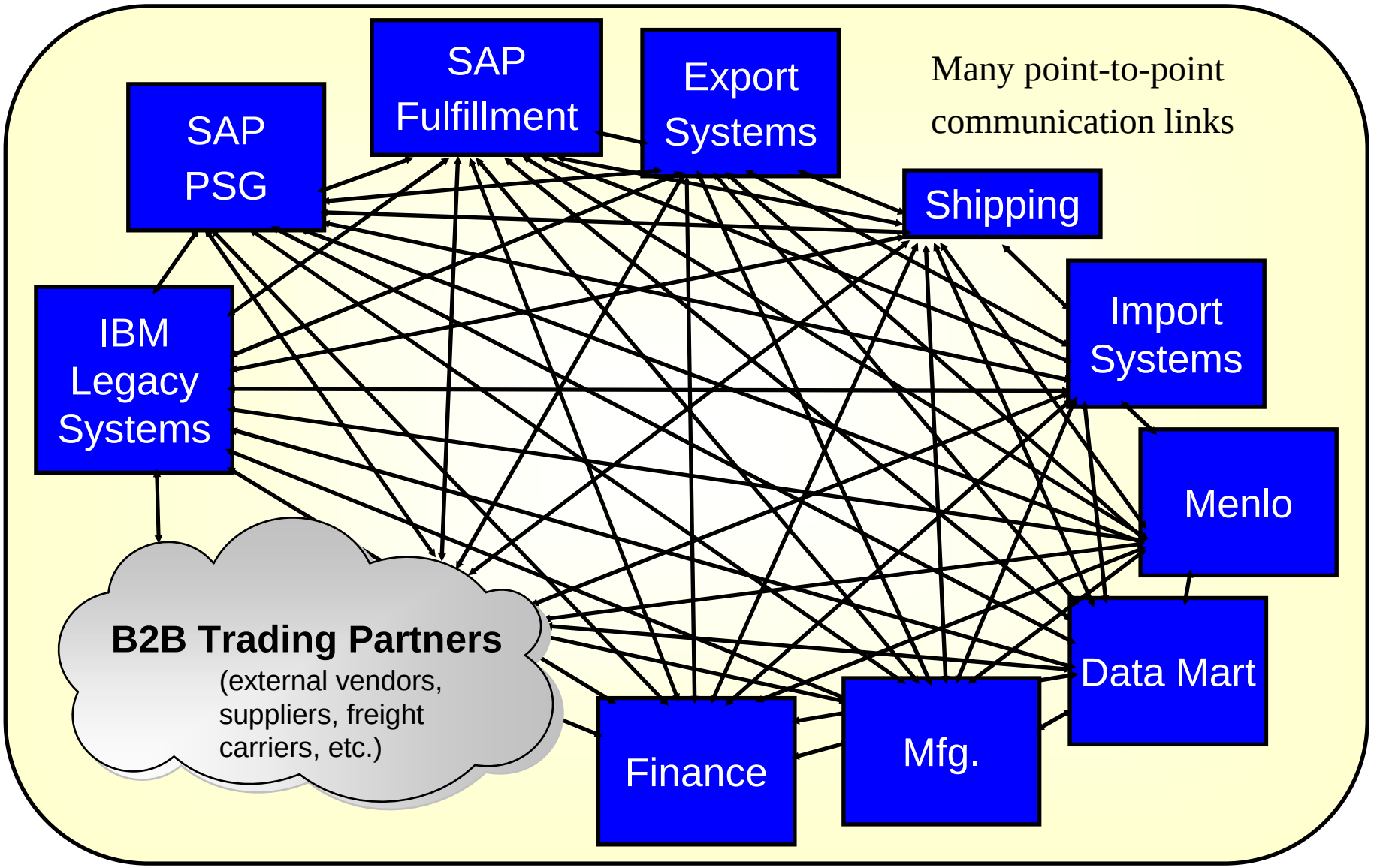
Without the Data Services Gateway



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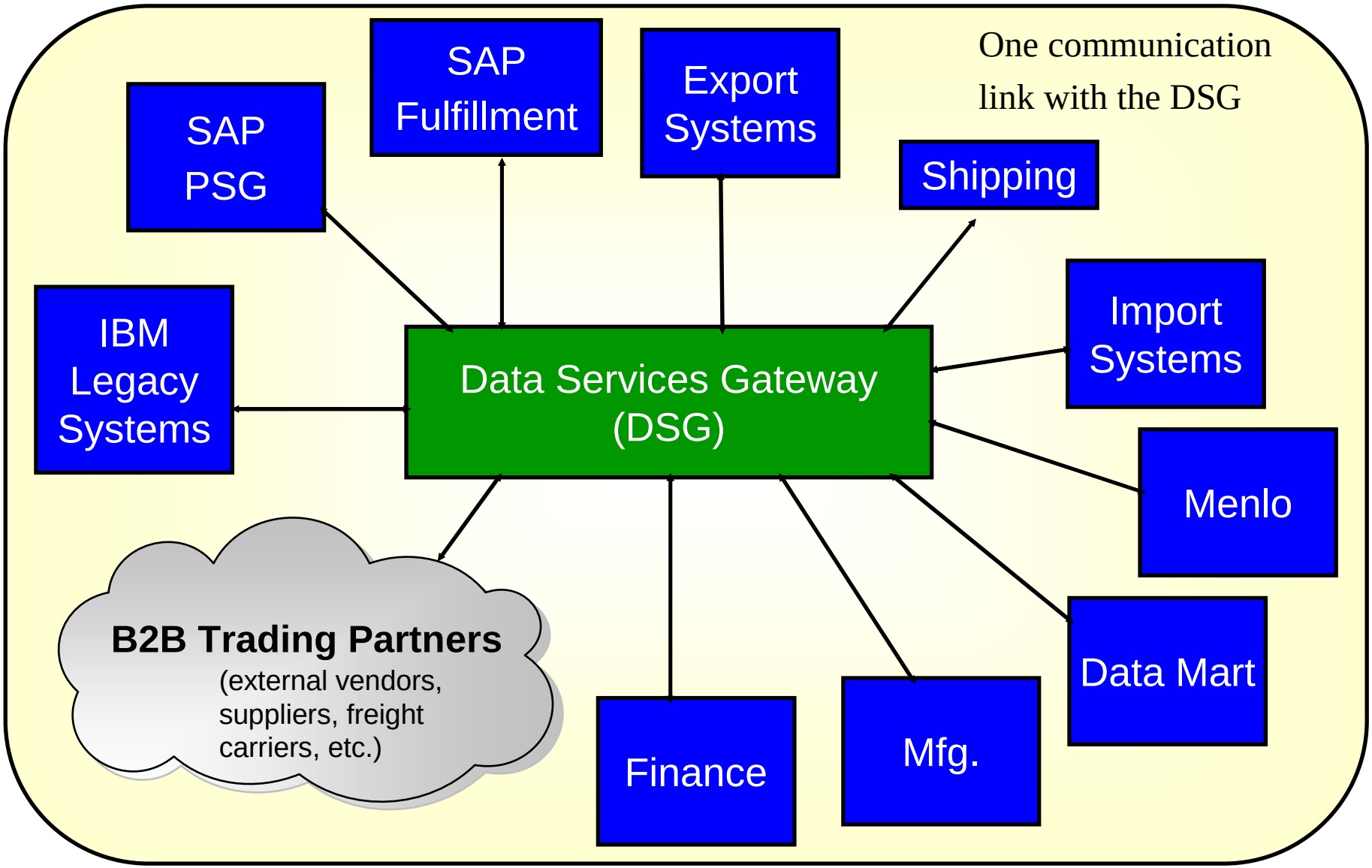
With the Data Services Gateway



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Functions Provided by the DSG

- Isolation layer
  - Changes in any one system are isolated from the other systems
- Message brokering service
  - Data transformation
    - Transpose/translate values and data format
  - Data delivery
    - Rules based delivery of data
    - One input data format, output to more than one destination
- Protocol conversion
  - Data may come into the DSG via WMQ, go out via FTP
- IES approved communication path with non-IBM entities

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The DSG Provides Middleware Services

- DSG is a collection of loosely coupled services
  - Message broker
  - Transformation service
  - Data delivery service
  - B2B service
  - Scheduling service
- Business data is not validated in the DSG
- Edits and audits are industry standards based
  - Message structure
  - Standards values
- The DSG is NOT a data store
- Built around communication links

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Summary of the DSG Concept

- Central integration point within IBM's logistics landscape
  - Spoke and Hub architecture
- Communications enabler
  - Allows multiple systems to communicate with each other
  - Allows IBM to communicate with other companies
- A collection of loosely coupled services
- Simplifies IBM trading partner communication
- Allows and promotes global standards

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Business Processes and Messages

- The Data Services Gateway supports the following messages in multiple industry standards
  - Advance shipment notifications
  - Import notifications
  - Export notifications
  - Carrier instructions
  - Carrier events
  - Customs invoices
  - Vendor shipment invoices
  - Customs declarations
  - Customs responses
  - Government reporting

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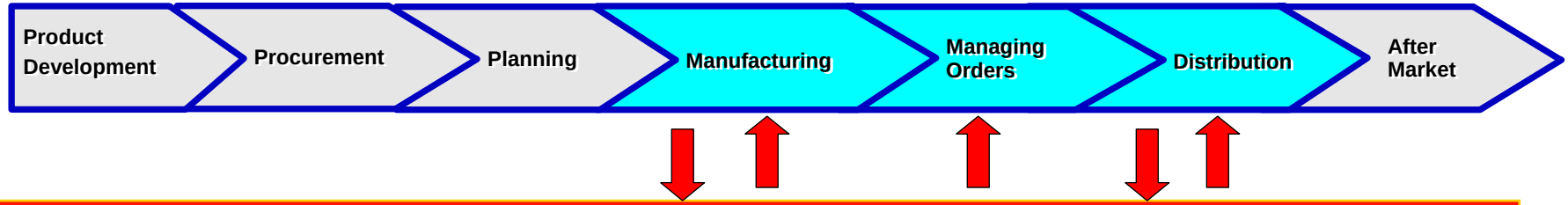
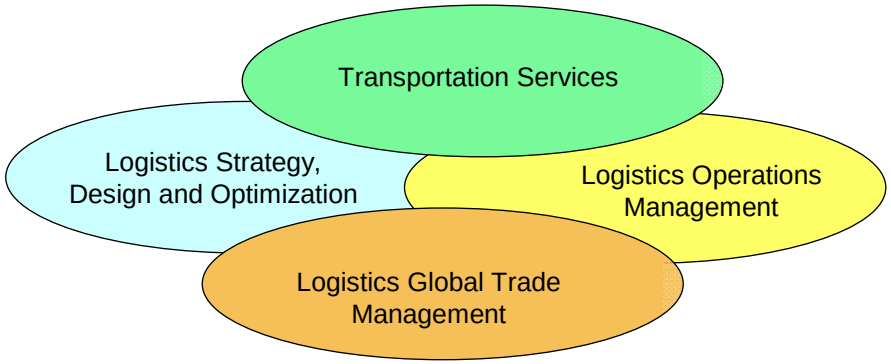


Business Integration Service - Data Services Gateway (DSG)

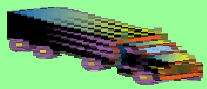
Global Logistics Processes



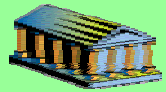
Trading Partner Gateway - Data Services Gateway (DSG)

Logistics Partners:

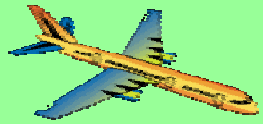
International Banks



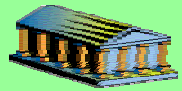
US Domestic Carriers



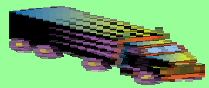
Commerce/ Exporting



International Carriers / Brokers



Customs/ Importing



In Country Carriers

In Country Banks

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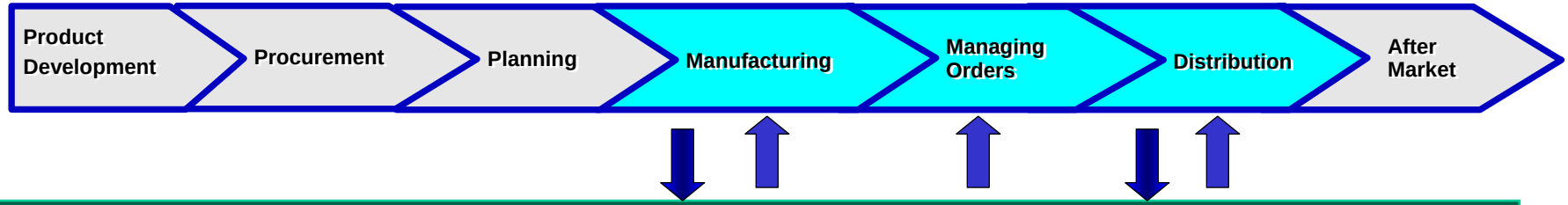
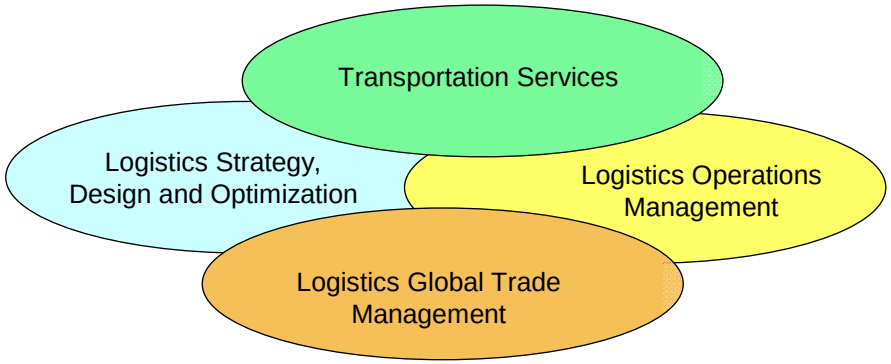


Business Integration Service - Data Services Gateway (DSG)

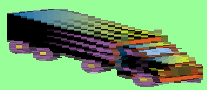
Global Logistics Processes



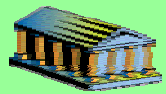
Partner Gateway - Data Services Gateway (DSG)

Logistics Partners:

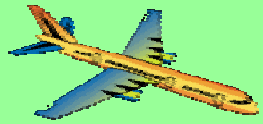
International Banks



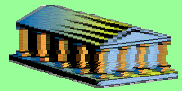
US Domestic Carriers



Commerce/ Exporting



International Carriers / Brokers



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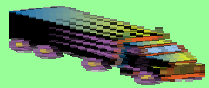

In Country Carriers

In Country Banks

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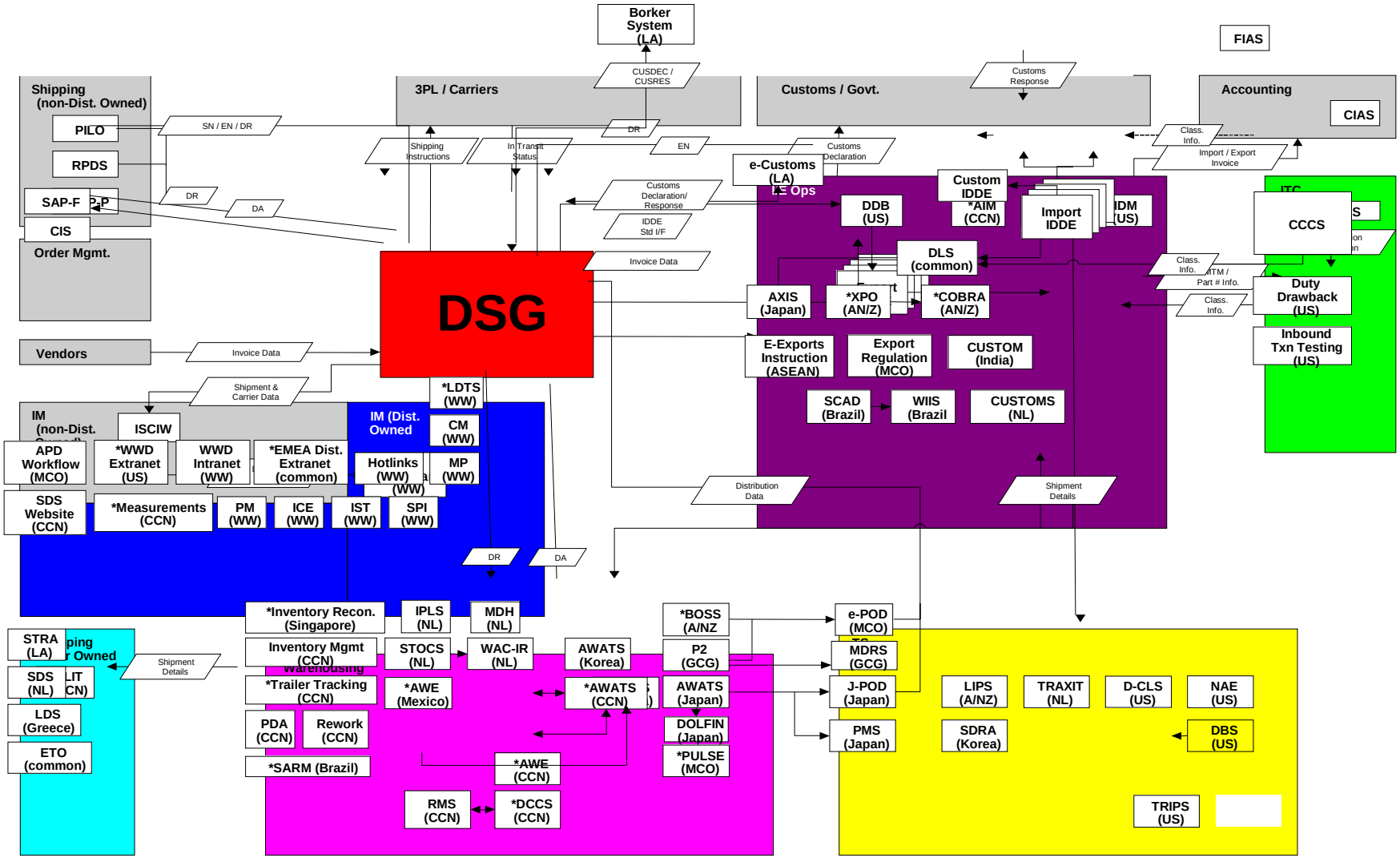
Global Logistics I/T Landscape



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Transportation Service Example

Delivery request

Shipping locations
- Mfg locations
- Distribution centers
- OEM vendors
- Etc.

Data Services Gateway

-Connectivity services

-Data transformation services

-Content based delivery services

-B2B services

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Transportation Service Example

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Delivery request

Data Services Gateway

-Connectivity services

-Data transformation services

-Content based delivery services

-B2B services

Delivery request

Global Logistics transportation services

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Transportation Service Example

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- Etc.

Delivery Request

Data Services Gateway

-Connectivity services

-Data transformation services

-Content based delivery services

-B2B services

Delivery request

Global Logistics transportation services

Advance shipment notification

Carrier instructions

Transportation service provider

Shipment details

Order Management

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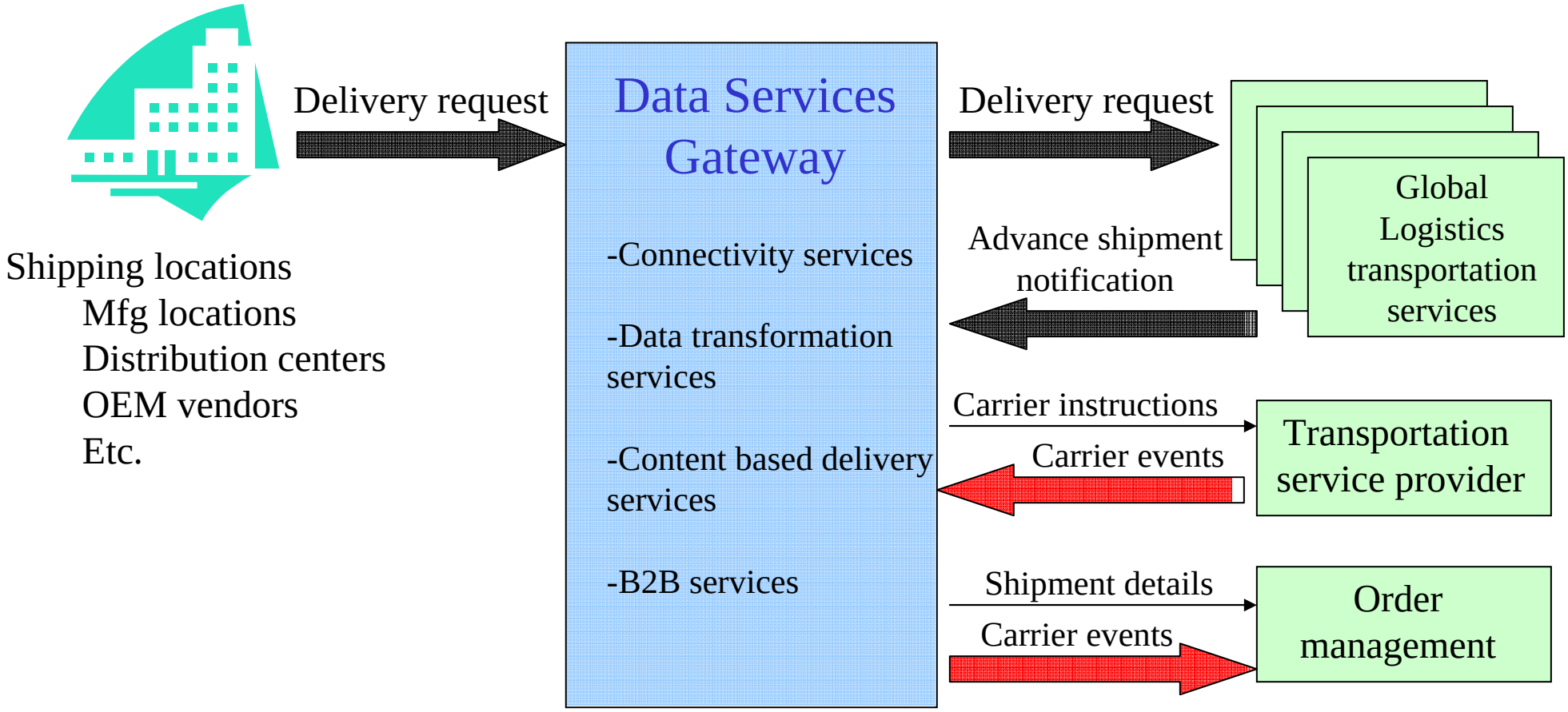
Transportation Service Example



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Benefit of Electronic Transportation Services

- Load optimization
  - Plan and consolidate shipments
  - Select most cost effective transportation service
  - Optimize freight pick up
- Electronic tendering of freight
  - Eliminates paper process
  - Allows carriers to plan in advance
- Customer visibility of shipment status
  - How is the order being shipped and with who
  - Estimated time of arrival
  - In-transit status

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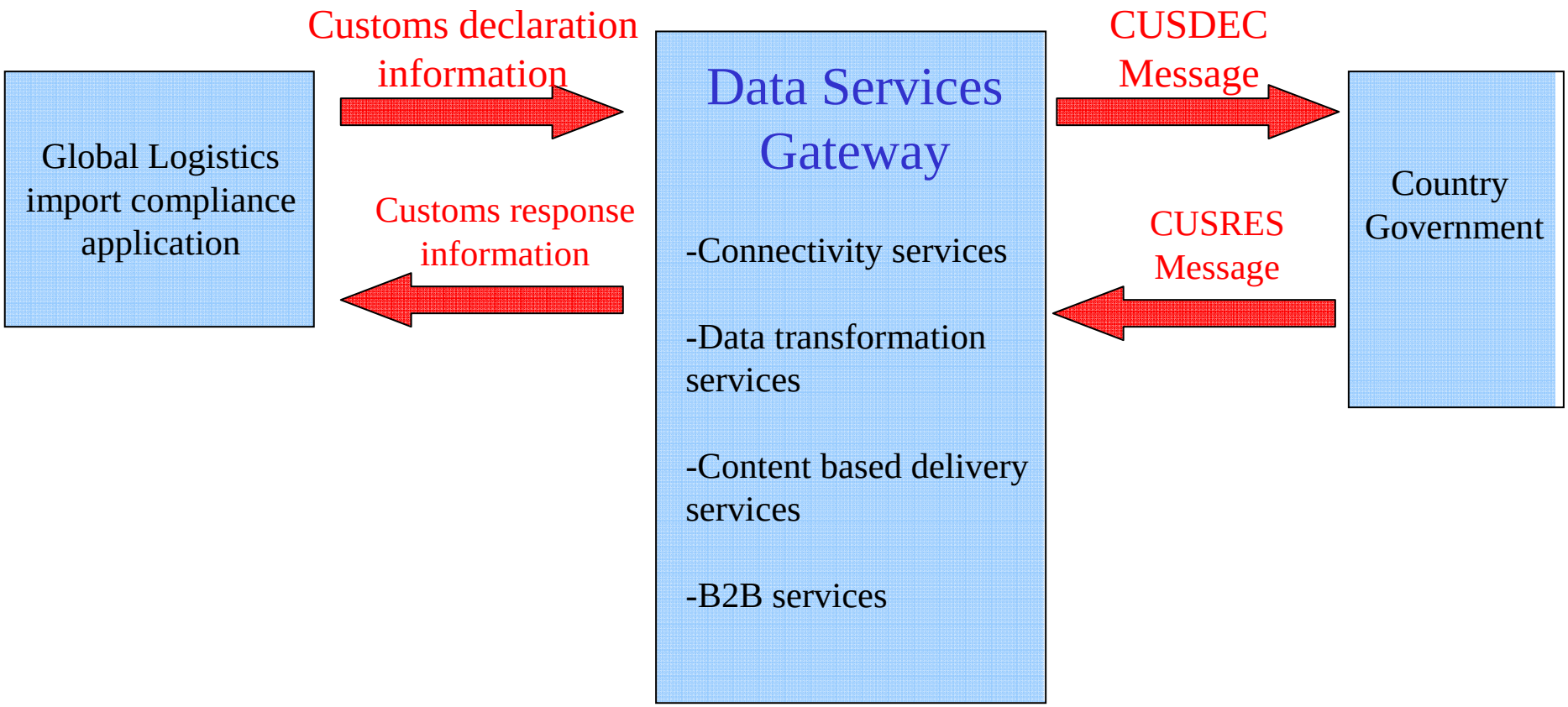
E-Customs Example



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Benefits of Electronic Customs Clearance

- Eliminates the middle man
- “Wheels Up” clearance process
  - Clearance process begins when the plane lifts
  - Goods have cleared customs prior to plane landing
  - Reduces delivery time to customer
  - Minimizes inventory costs in the delivery pipe

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Summary of Business Processes and Messages

- Electronic Communication with business partners is essential
- Middleware solution needs to be robust enough to support IBM's and the business partner's requirements
  - Multiple message formats and standards
  - Multiple communications options
  - Rapid deployment capability

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DSG Architecture Overview

- Architecture
  - Mix of AIX and MVS environments
  - Run once (one installation used worldwide)
    - 24x7x365
  - Architecture allows on demand deployments during prime time without interruption (or limited interruption) to DSG customers
  - Deployments and changes can be implemented within days
    - 125 to 150 projects implemented each year
- Operations
  - Different than a “typical” application

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DSG Architecture

- The DSG consists of 4 individual interconnected environments
  - Message broker, transformation and delivery services
    - Runs in a MVS (z/OS) environment
  - EDIINT server
    - Runs in an AIX environment
  - Two yellow zones (extranets or DMZs)
    - Public yellow zone (extranet or DMZ)
    - Restricted yellow zone (extranet or DMZ)

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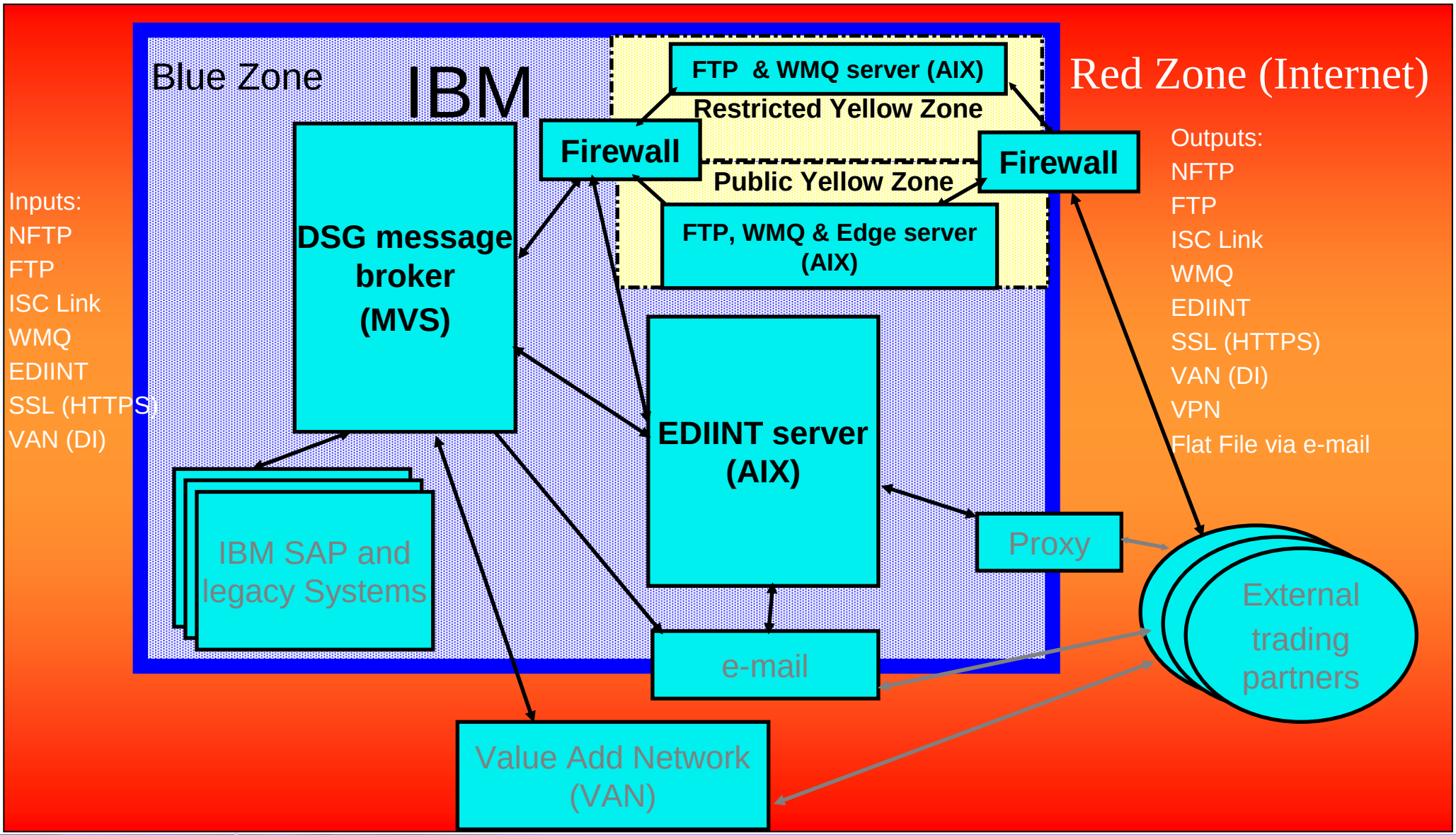
DSG Environment



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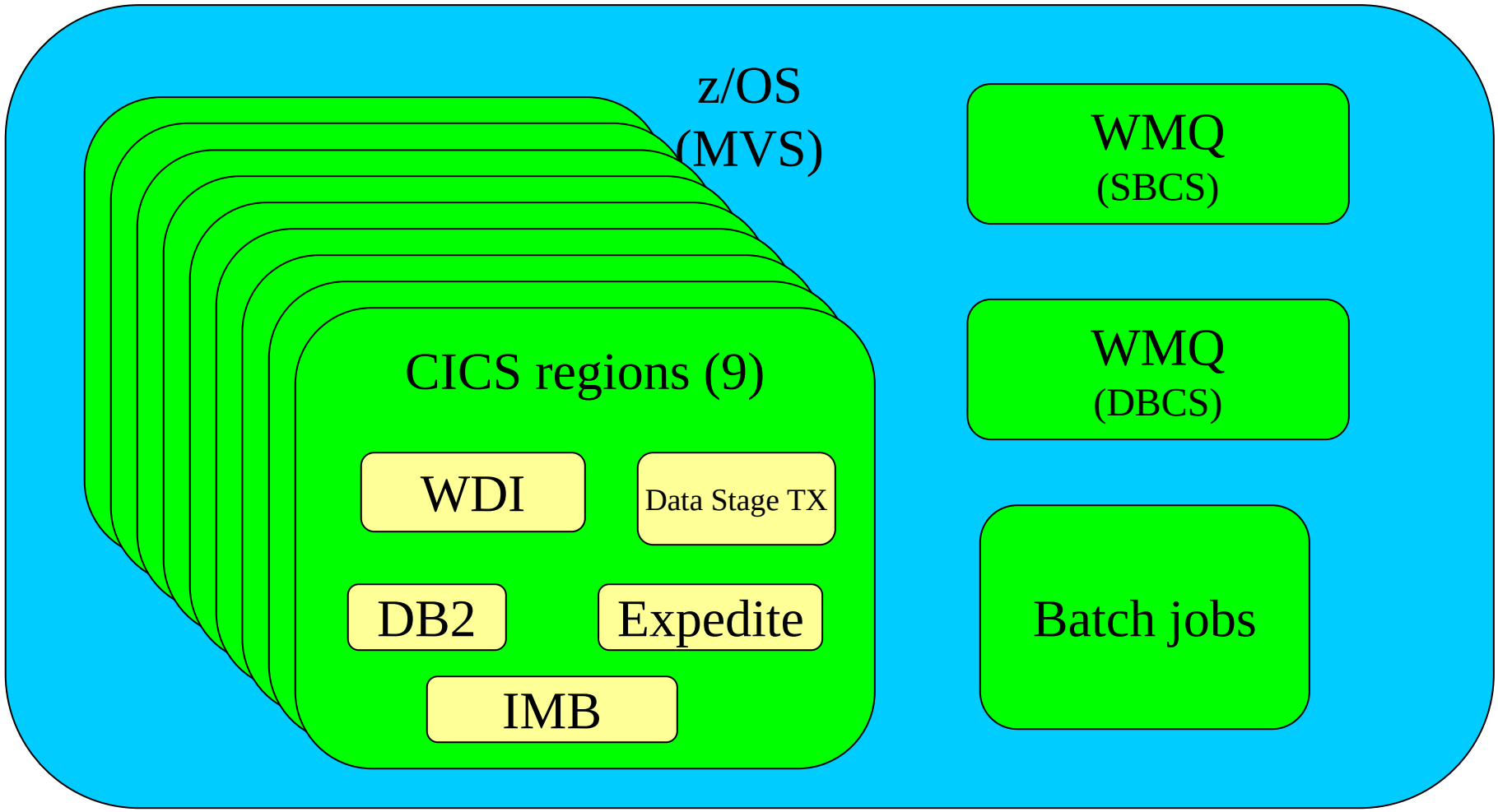
DSG MVS Environment

Communication protocols: FTP, NFTP, WMQ, value added network, e-mail



* IMB (Intelligent Message Broker) is not part of the WebShpere family and should not be confused with WMB

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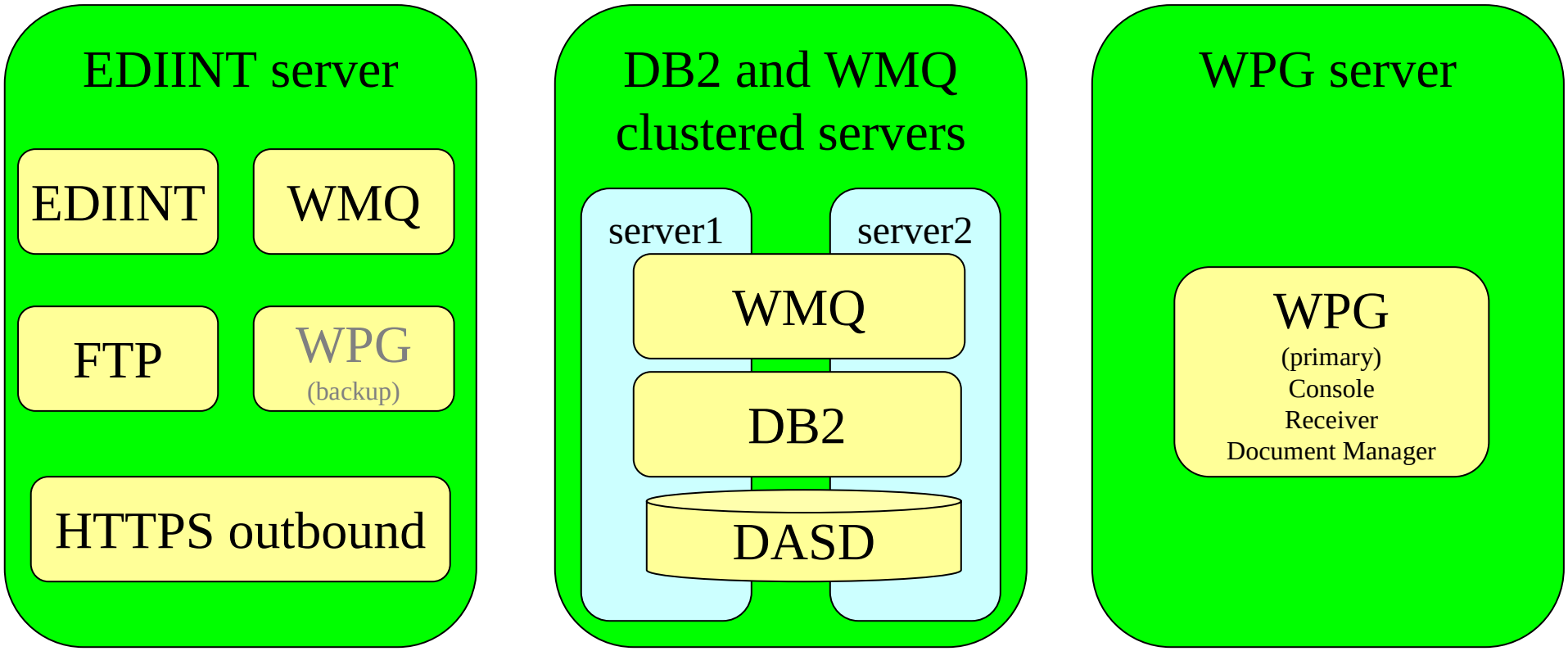
DSG Blue Zone AIX Servers

(current)

Communication protocols: FTP, SSH, AS1, WMQ, HTTPS, e-mail



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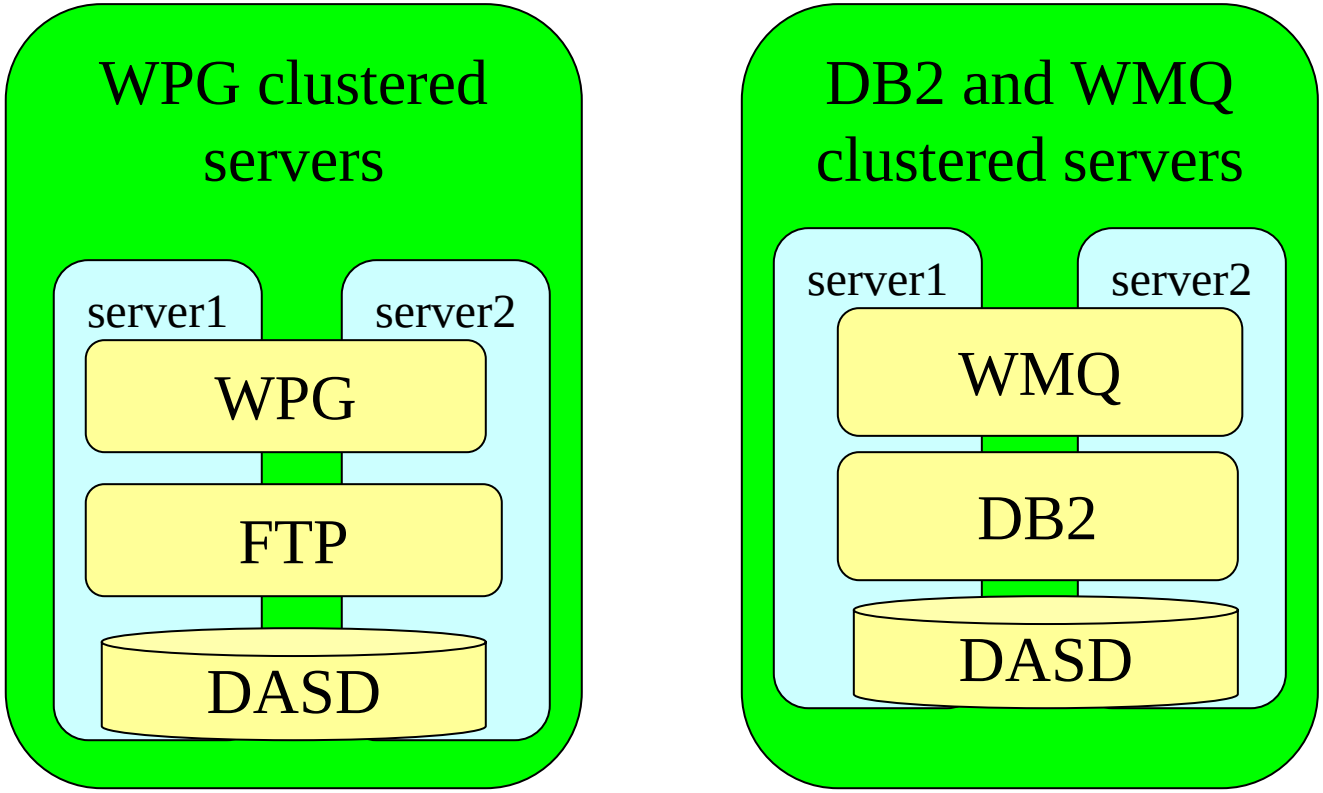
DSG Blue Zone AIX Servers

(target configuration)

Communication protocols: FTP, SSH, AS1, WMQ, HTTPS, e-mail



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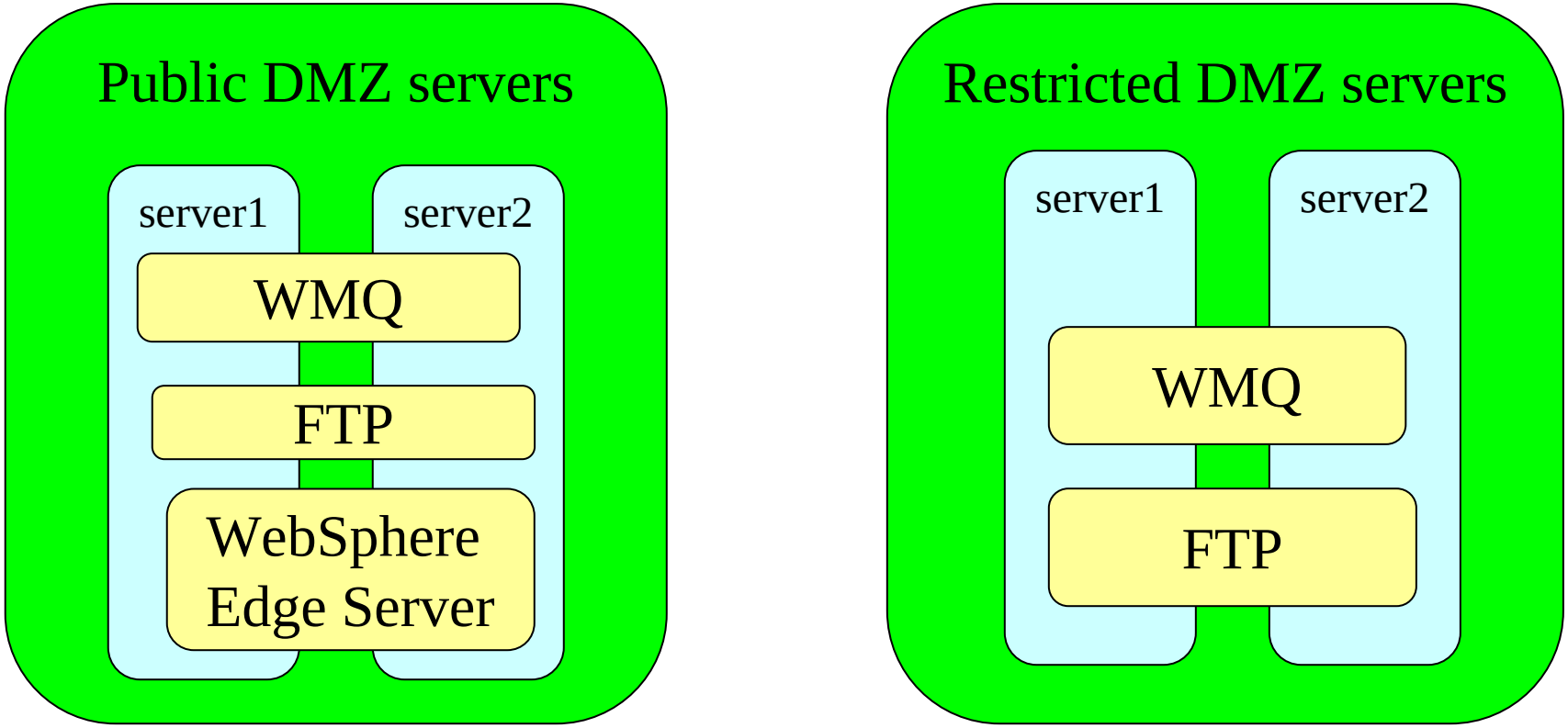
DSG Yellow Zone AIX Servers

Communication protocols: FTP, SSH, WMQ, AS2 (soon)



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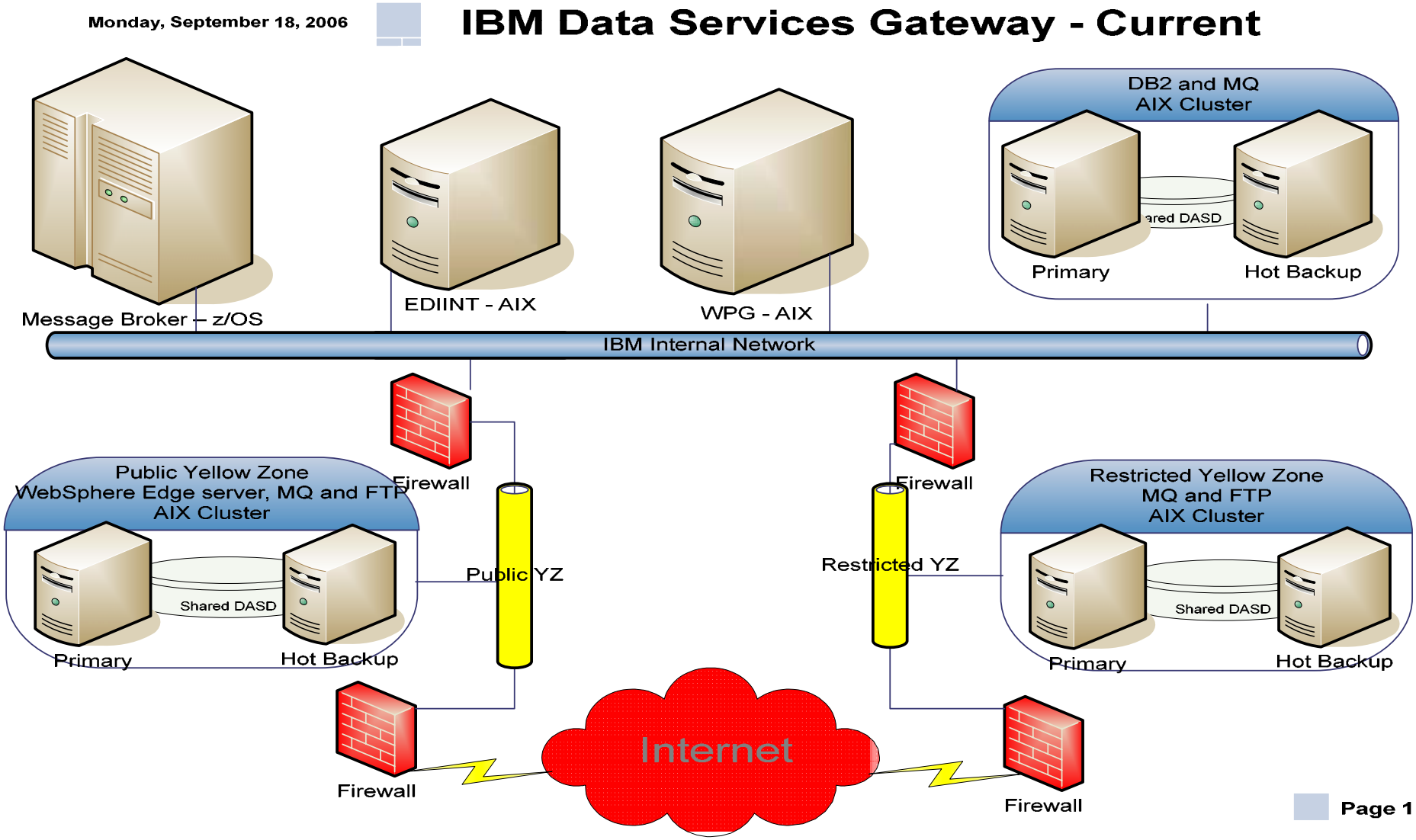
Physical view of the DSG



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DSG usage of WebSphere Data Interchange

- WebSphere Data Interchange 3.2.1
  - At fixpack 14
  - Migrating to FP19
- Execution engines run on z/OS
  - CICS (real time)
  - Batch execution
- Map Development
  - On developer's workstation
- Mapping for industry standards

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DSG usage of Data Stage TX

- Data Stage TX 8.0
- Execution engines run on z/OS
  - CICS (real time)
  - Batch execution
- Map development
  - On developer's workstation
- Application to application transformation

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WebSphere MQ usage in the DSG

- Standard WebSphere MQ setup
  - Typical usage
- Common collection point
  - Used in DMZ to control security and reduce maintenance costs
- Passthru
  - DSG used as a data pipeline

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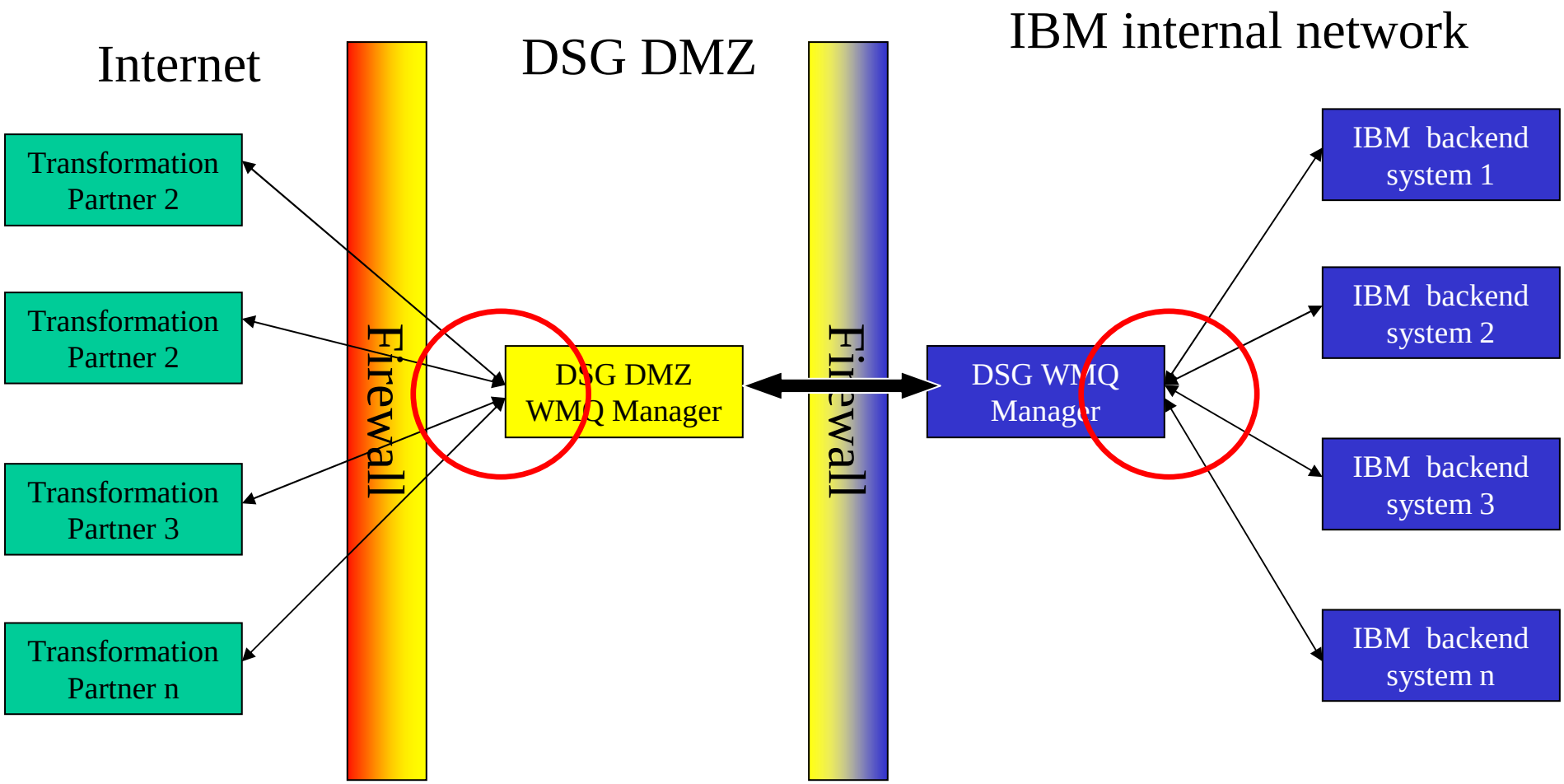
Common Collection Point



Provides defined, secure path through firewalls, maintains security yet allows multiple systems to communicate

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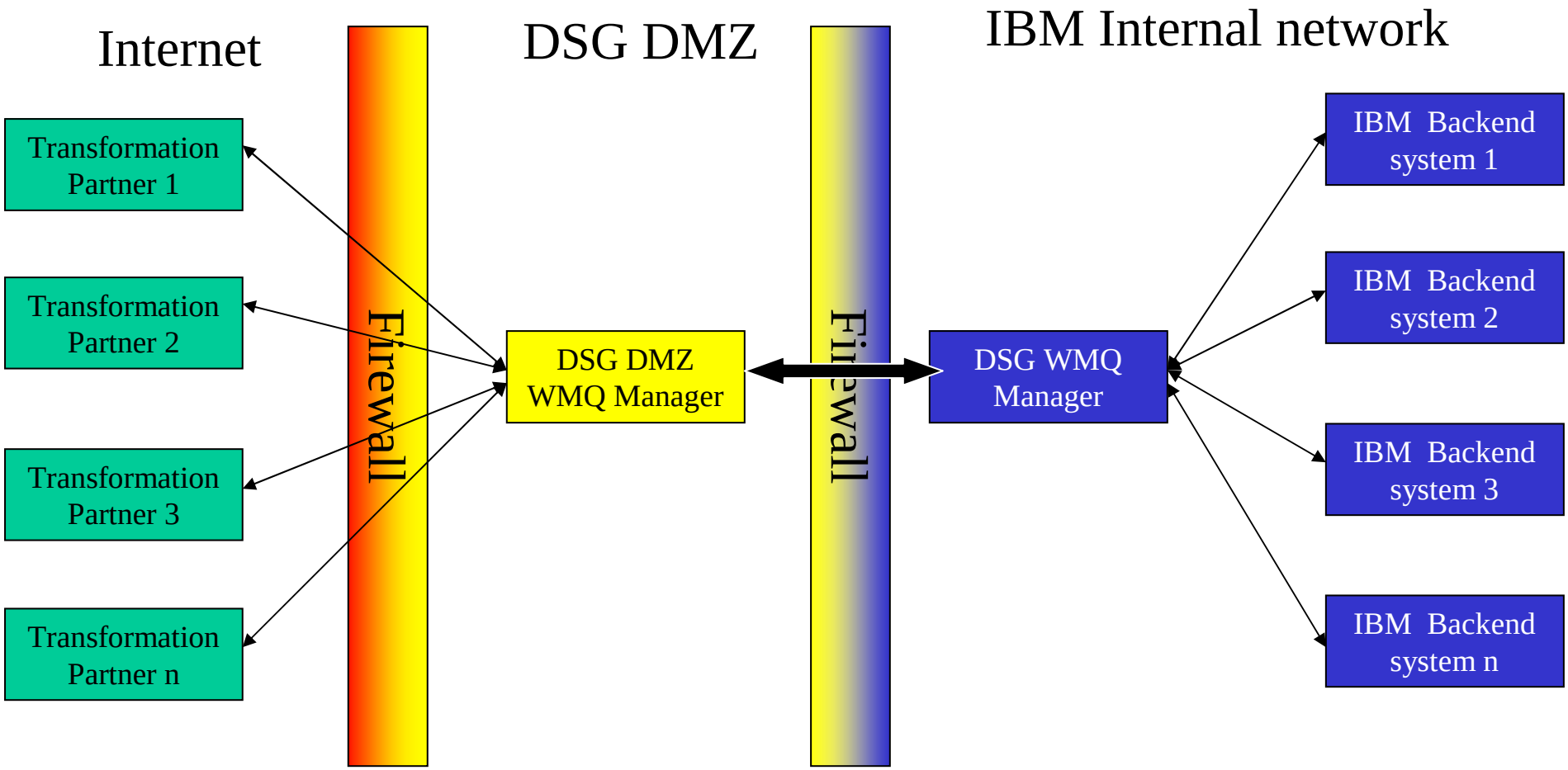
WebSphere MQ Passthru



The end points appear to talk directly to each other and all data is routed via WMQ through the DSG to allow communication between transformation partner and IBM backend

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DSG Operations

- DSG Goal: Identify and resolve any issue before a customer notices
- Gateway Operations team represents all DSG hosted customers
  - 200+ customers
  - Over 600 data paths through the DSG
  - 3 HC to support 24x7
  - Automated monitors
- Processes $35B of IBM goods per year
  - “Down time” is measured by any disruption of service to the customer
  - 1 hour of down time results in executive alerts
- DSG is not responsible for the absence of data
- Network availability is essential
- Maintenance
  - Typical weekly maintenance is less than 30 minutes
  - 6 hour disaster recovery process

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DSG Future & Growth Areas

- DSG Growth Area
  - External communication driven by more and more outsourcing
  - Business model will require extensive B2B connectivity
    - WebSphere Partner Gateway
- Looking forward….
  - Add WPG to enhance B2B communications
    - Extend current AS1 capabilities
    - Enable AS2 capability
    - Position for AS3 (replace current FTP processes)
    - Enable redundancy & high availability within the DSG environment
  - XML
    - Transportation industry is starting to adopt XML as a replacement for EDI
  - Investigate WMB as replacement for IMB
    - Determine appropriate platform

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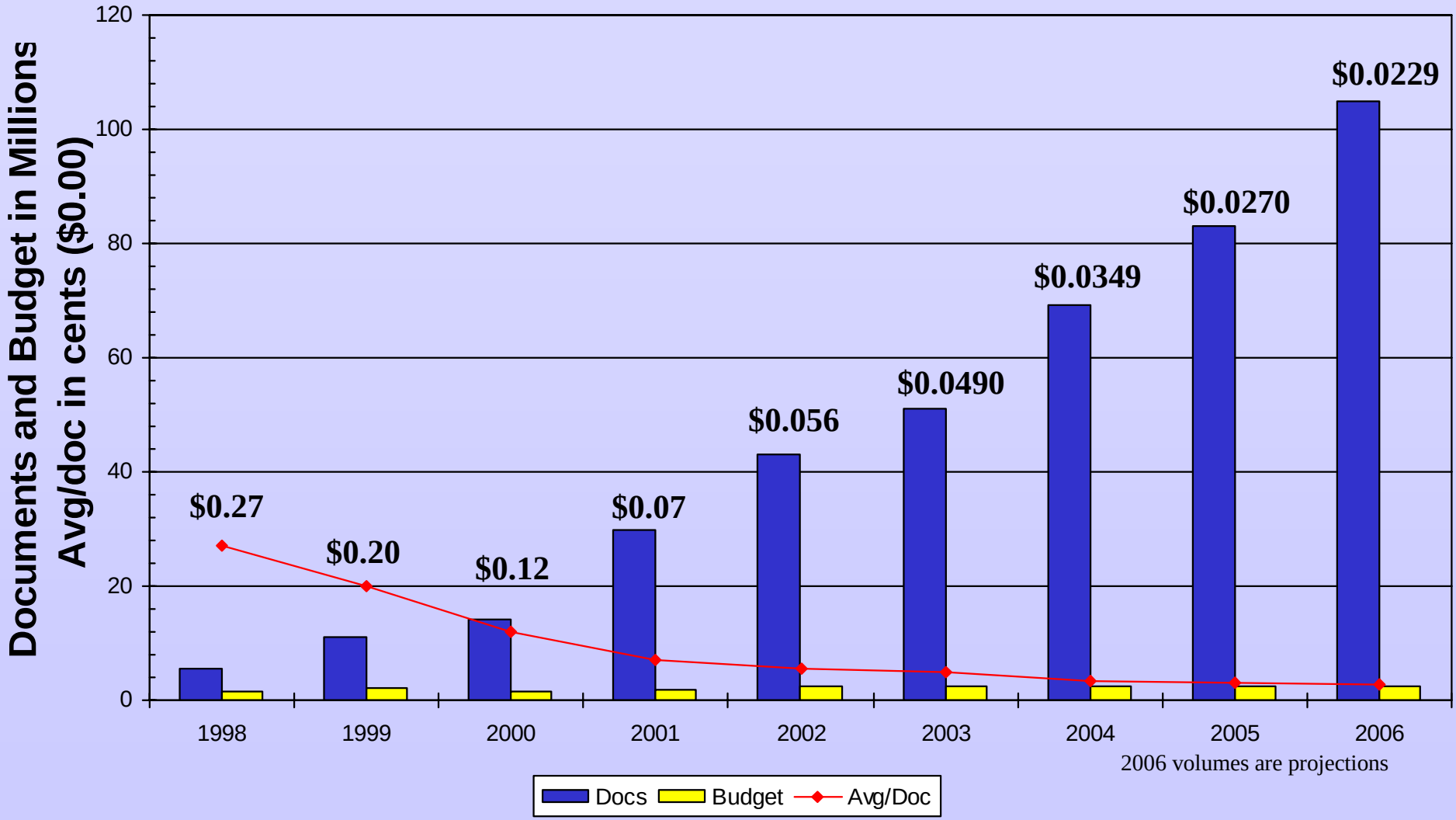
Data Services Gateway Results

Yearly Budget, Volumes & Average Cost per Transaction



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DSG Summary

- DSG Concept is to provide system-to-system communication
  - B2B
  - Within IBM
- DSG architecture utilizes a mix of tools which are loosely coupled and integrated across multiple platforms
- DSG provides interconnectivity for IBM Global Logistics
- The DSG has returned approximately $1B in cost avoidance savings to IBM Global Logistics
- Future growth is in B2B
- DSG utilizes WDI, Data Stage TX, WMQ and will soon use WPG in a mixed MVS and AIX environment

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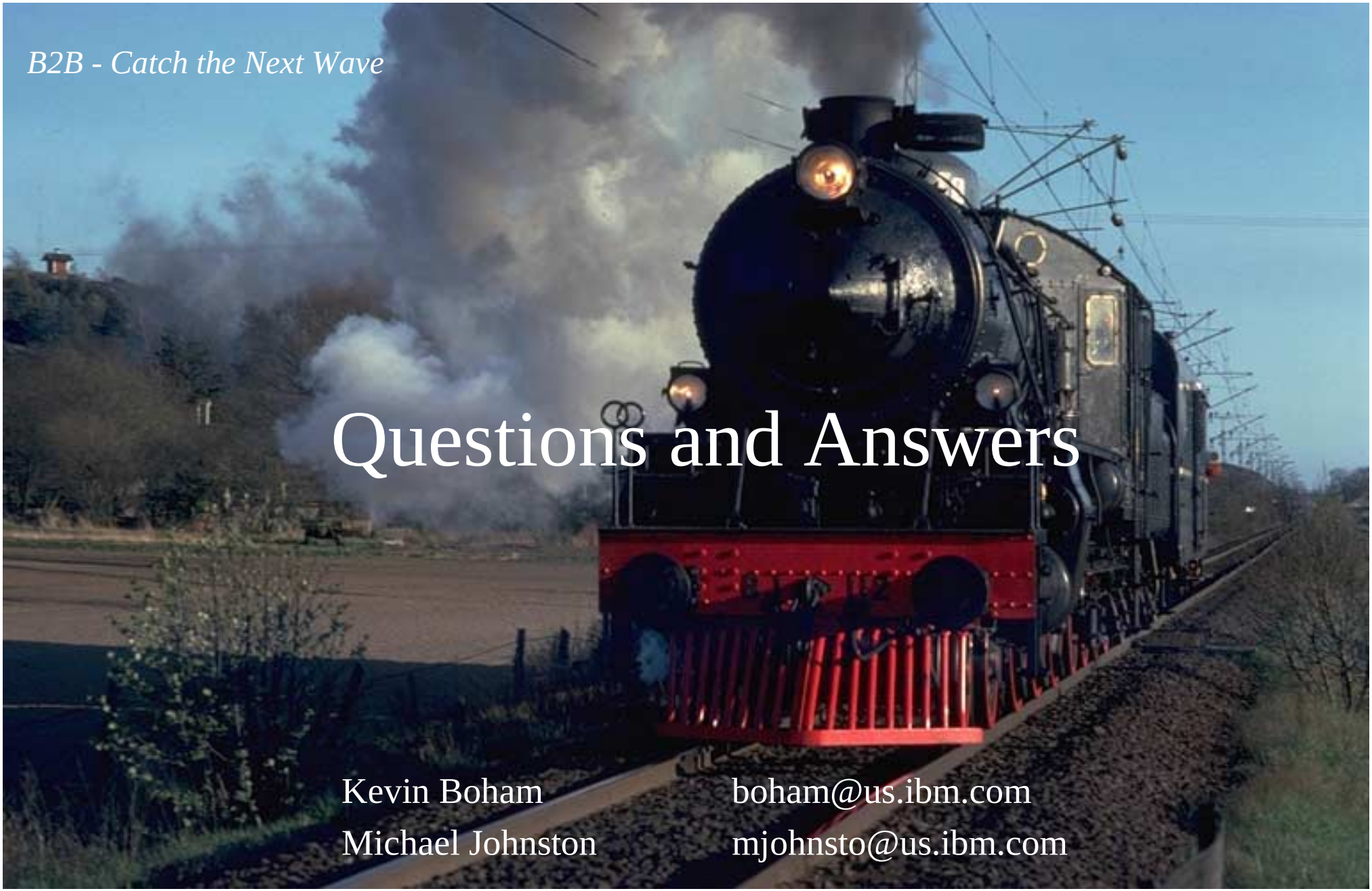

Questions and Answers

Kevin Boham boham@us.ibm.com
Michael Johnston mjohnsto@us.ibm.com

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