Extending Your Mainframe for More Business Value

Extend Connectivity With a Mainframe Communications Backbone

Business Challenge

Our payments business is a key source of revenue, but it is too costly to maintain the connections

Service Oriented Finance CIO

A Communications Backbone can solve this problem

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Providing Application-to-Application Connectivity Can Be Complicated

- System Platforms

- Programming Models

Asynchronous Messaging | Synchronous RPC | Publish/ Subscribe

- Programming Languages

RPG | COBOL | Java

- Transport Protocols

Web Services | WebSphere MQ | JMS | FTP | TCP/IP Multicast | HTTP | SMTP

- Standards & Message Formats

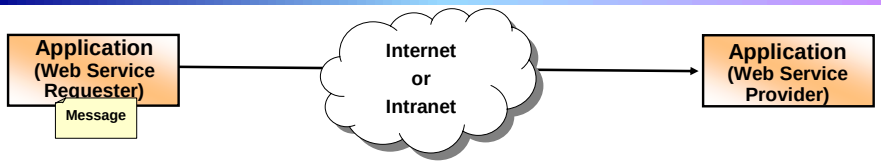
ACORD | HIPAA | ebXML | COBOL Copybook | SWIFT | EDI-X.12 | Word/Excel/PDF | Custom Formats | XML | FIX | AL3 | EDI-FACT | HL77

- Error Recovery

How to Provide Application-to-Application Connectivity

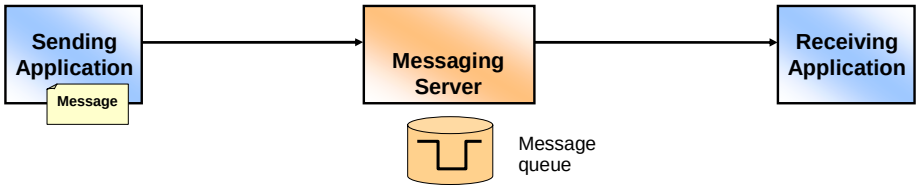
- Installed environments are very diverse
  - No single technology can provide the all of the required power and flexibility
- Use a combination of middleware technologies as needed
  1. **Web Services**
     Standards-based, heterogeneous, Internet-based exchanges
  2. **Asynchronous Messaging**
     Adds reliability, assured delivery, application de-coupling
  3. **Mediation Broker**
     Adds services to transform and enrich information as it flows from one application to another
- Implementations of these technologies is known as an **Enterprise Service Bus**

Web Services Provide Simple Point-to-Point Connectivity



- Advantages
  - Almost every platform supported
  - Standards-based, works across the internet
- But there are considerations…
  - The requester and provider must be running at the same time
  - No infrastructure for managing overall web services
- Mainframe supports web services via WebSphere Application Server, CICS, and IMS SOAP Gateway

Message Queues Provide Greater Flexibility with Asynchronous Messaging

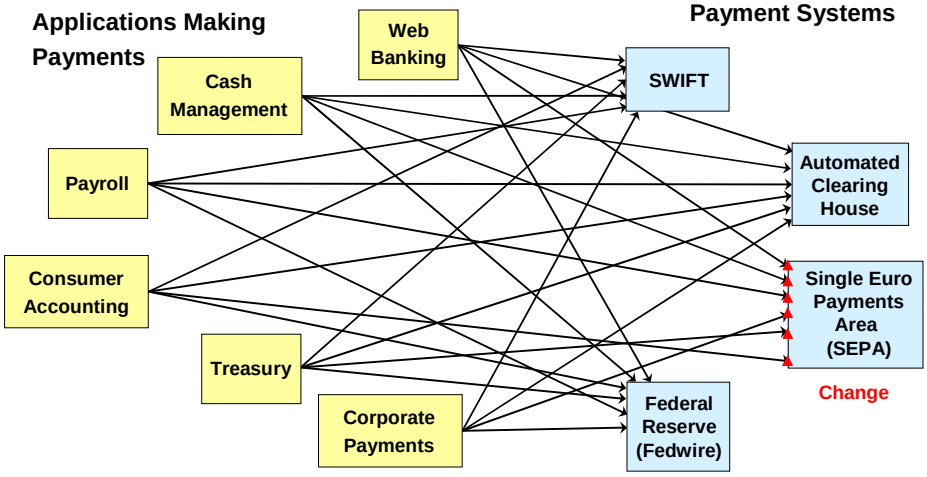


- Sender and receiver do not need to run at same time
  - Put and get messages from queues
- Reliable, assured delivery
- Sender and receiver can process messages at different rates
- Message servers can be networked together
  - Messages automatically arrive at named destination queue
- Mainframe supports messaging via WebSphere MQ and WebSphere Application Server (JMS)

Connect Applications Point-to-Point with WebSphere MQ

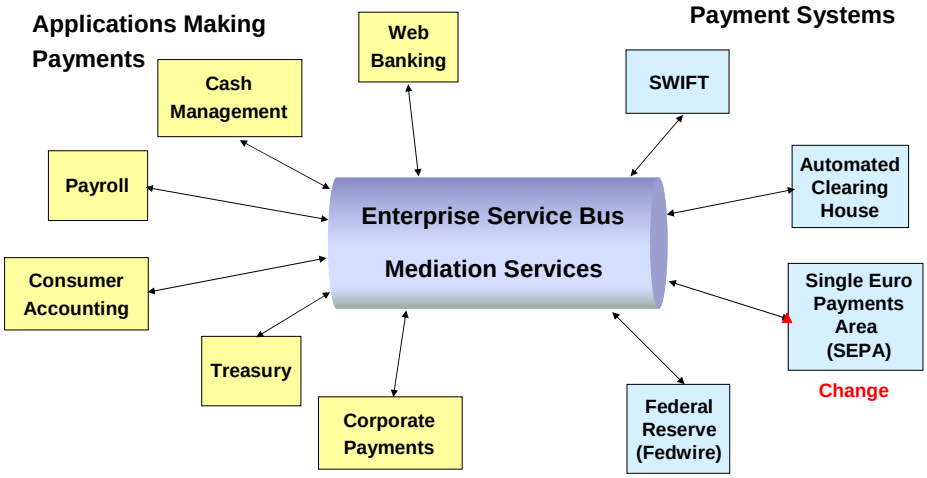
- Connects to virtually everything
  - Over 80 platform configurations
  - Uses IBM Message Queuing Interface (MQI), Java Message Service (JMS), or SOAP/JMS
- Very simple API (put/get) for all main programming languages: C++, C#, Visual Basic, .NET, COBOL, Java
- The de facto standard for asynchronous messaging
  - 42% of z/OS customers have WebSphere MQ
  - 90% of the Fortune 100 businesses have WebSphere MQ
  - 60% of the Fortune 500 businesses have WebSphere MQ
  - 66% of North American and European banks
  - Banking clients move transactions worth $35 trillion/day
  - Government clients move 675+ million messages/day

However, Point-to-Point Connectivity Can Be Costly to Maintain



- Services are tightly coupled to one another
- One change requires many other changes

An Enterprise Service Bus Reduces Costs By Providing Centralized Mediation Services



- A change requires only one change in the ESB mediation services
- Services can be created and maintained independently

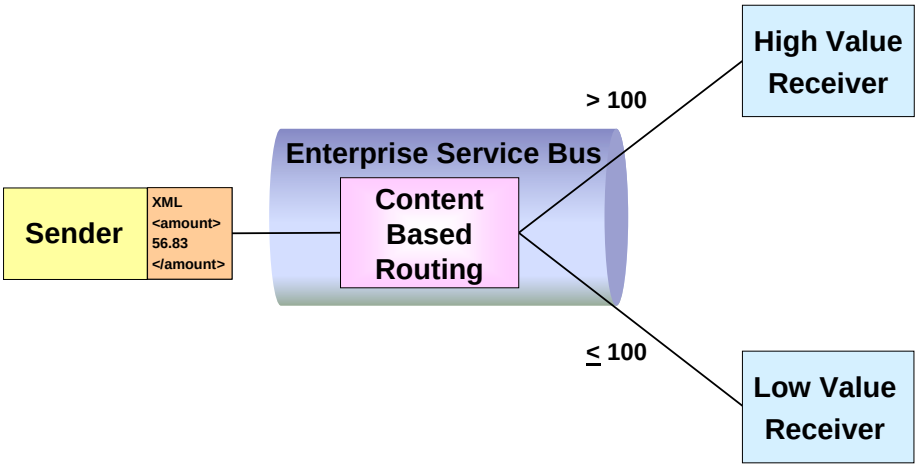
Case Study – Analysis Showed Benefit of Using WebSphere Message Broker for Enterprise Integration

- The ESB on z/OS solution offered these benefits over the custom point-to-point connection option over the 5-year period:
  - 62% reduction in solution build cost
  - 73% reduction in on-going code maintenance of the integration solution
  - 42% reduction in infrastructure administration
- For an investment of $2.5M in WebSphere software, the company would realize a benefit of **$165M** over a 5-year period
  - Resulting in an ROI of **6,715%**

Source: High-level analysis for a large U.S. Health Insurance Company using IBM's Business Value Assessment (BVA) model, 2006

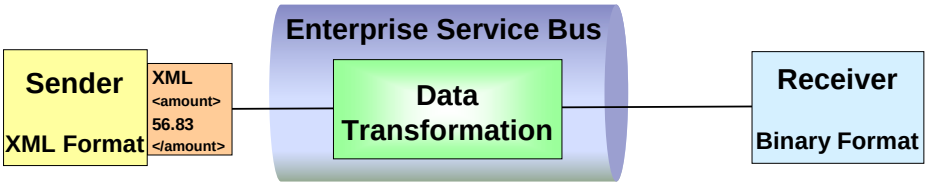
Mediation Service: Content-Based Routing

Example: Route payment based on payment amount



Mediation Service: Data Transformation

Example: Transform XML to binary format

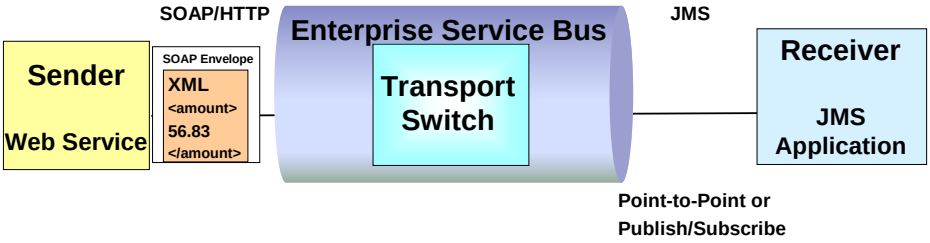


Other Common Transformations

- One XML schema to another XML schema
- Industry specific transformations, e.g., FIX to SWIFT

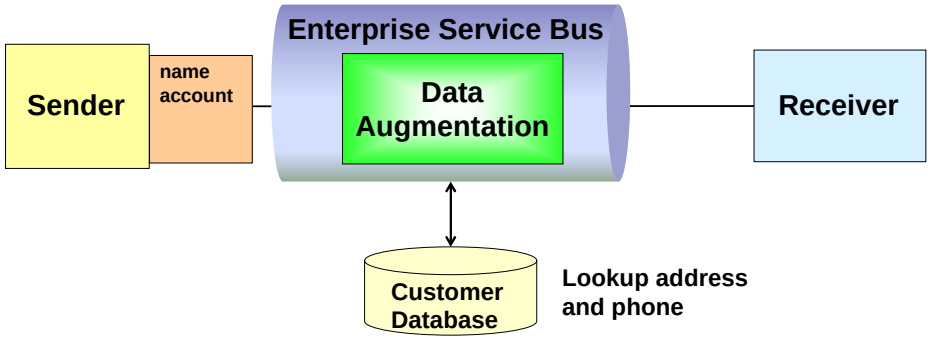
Mediation Service: Transport Switching

Example: Switch from SOAP/HTTP to a JMS message



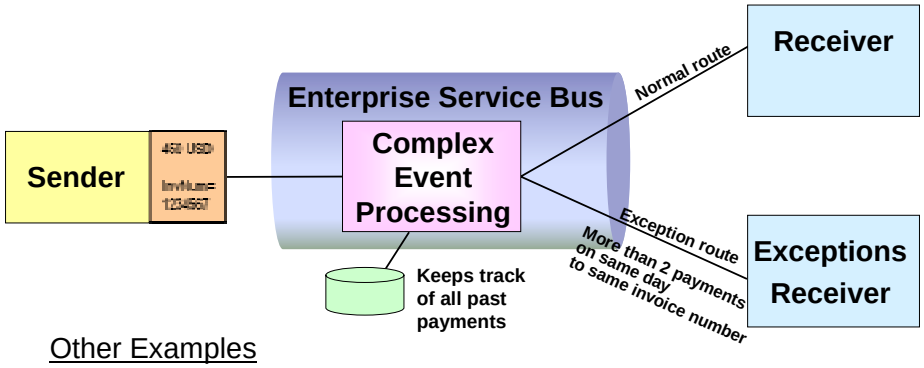
Mediation Service: Data Augmentation

Example: Add customer information from an external database



Complex Event Processing

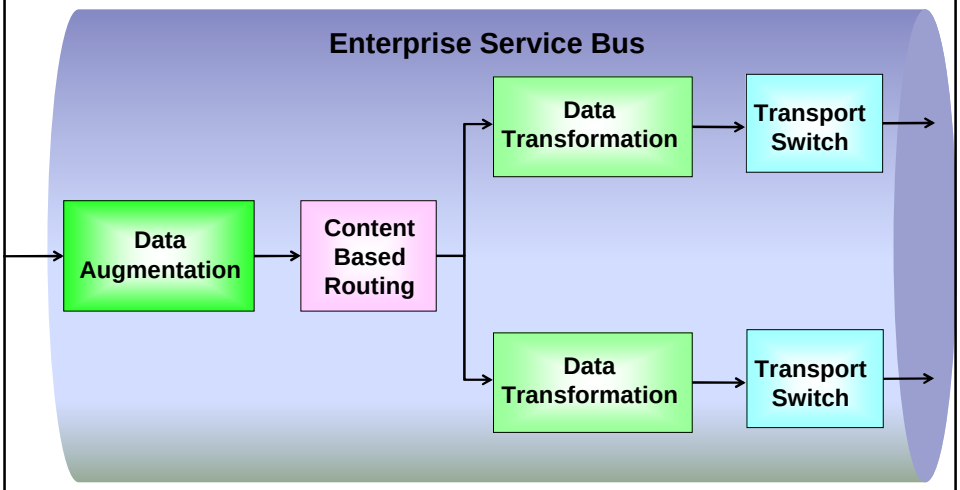
Example: Fraud detection and alerting



Other Examples

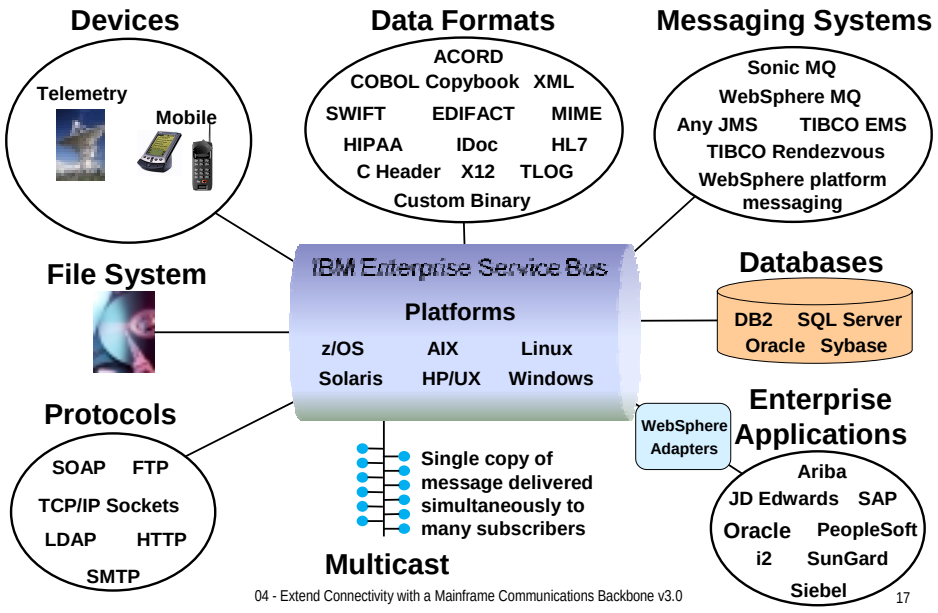
- Enforcement of regulatory constraints
- Periodically report aggregate payments
- Service level agreement monitoring and notification

Combine Mediation Services Together To Meet Connectivity Requirements



- Combine mediation services in any order
- Construct mediation flow to connect services

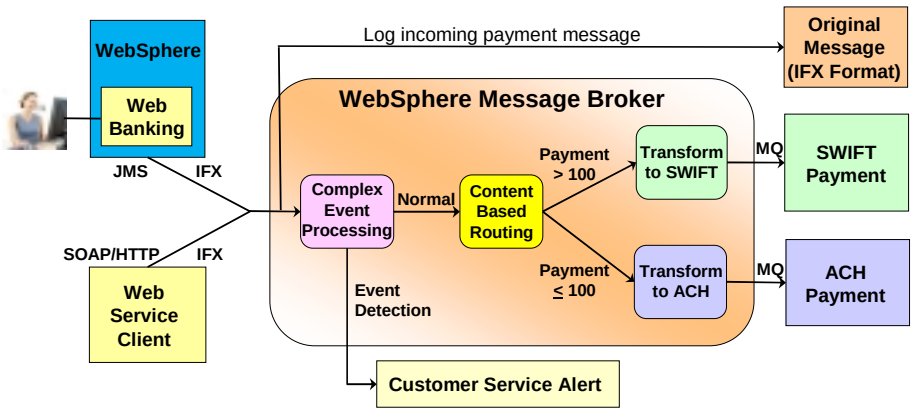
IBM Enterprise Service Bus Connects Almost Anything to Anything



Implementing Your Enterprise Service Bus Depends Upon Your Requirements

	Web Services and Mediation	Extend Reach and Speed
	WebSphere ESB (Runs on z/OS)	WebSphere Message Broker (Runs on z/OS)
Built on WebSphere Application Server	✓	
Wide Range of Platforms	✓	✓
Web Services (SOAP/HTTP)	✓	✓
Content-Based Routing & Transformation	✓	✓
Transport Switching & Database Support	✓	✓
Adapters for Enterprise Applications	✓	✓
XML Data Format	✓	✓
Non-XML Data Formats		✓
Complex Event Processing		✓
Content-Based Publish/Subscribe		✓
Mobile and Telemetry Devices		✓
Multicast		✓
Third Party Messaging Systems		✓

DEMO: Using WebSphere Message Broker For Payments



- Web banking payments routed to payment system based on amount
- Transformation from IFX to SWIFT and ACH formats
- 3rd payment on same invoice number on same day creates customer service alert
- Payments are processed exactly the same for a web service client

Run Your Communications Backbone on the Mainframe

What platform should I use to run my communications backbone?

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Extend your mainframe to provide a communications backbone with WebSphere MQ and WebSphere Message Broker on System z

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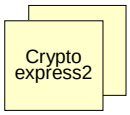
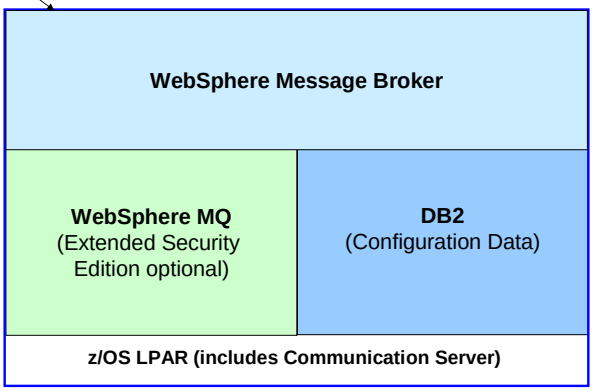
Mainframe Extension Solution – Communications Backbone

WebSphere Message Broker Includes three components installed in one LPAR with z/OS

WebSphere Message Broker Developer Toolkit Windows or Linux



Optional hardware cryptography assist

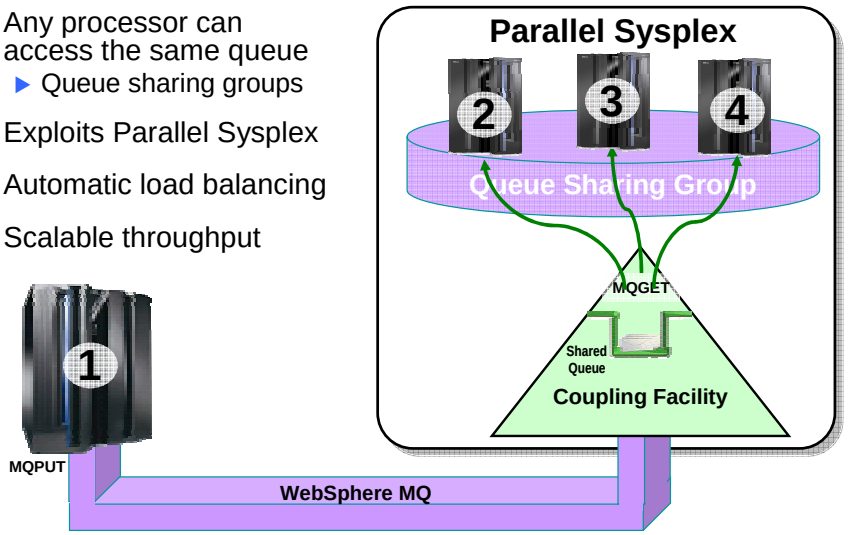


Communications Backbone Exploits z/OS Capabilities

- Exploits sysplex clustering to provide true 24X7 operations
  - WebSphere MQ takes advantage of Parallel Sysplex to enable MQ shared queues
- Leverage System z hardware advantages
  - Huge I/O bandwidth
  - Hipersocket in-memory networking eliminates latency
  - Unmatched hardware reliability
  - Crypto Cards accelerate encryption
- RACF security
- Disaster recovery via GDPS
- Capacity upgrade on-demand for unexpected peaks

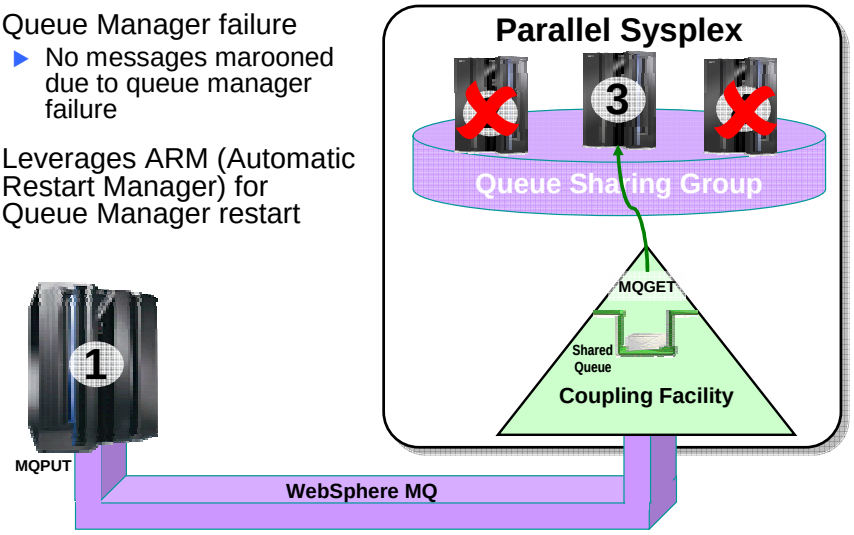
WebSphere MQ Shared Queues on z/OS

- Any processor can access the same queue
  - Queue sharing groups
- Exploits Parallel Sysplex
- Automatic load balancing
- Scalable throughput



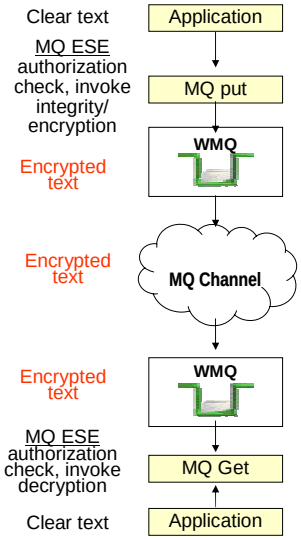
Shared Queues Enable High Availability

- Queue Manager failure
  - No messages marooned due to queue manager failure
- Leverages ARM (Automatic Restart Manager) for Queue Manager restart



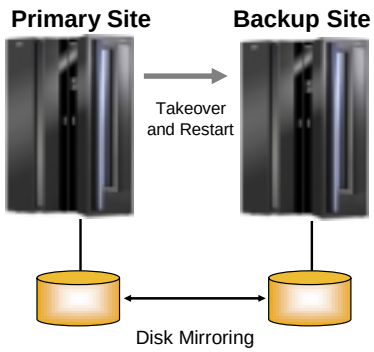
WebSphere MQ Extended Security Edition for z/OS V6 Enhances Security and Compliance

- Protects message data end-to-end-including when it resides in queues. 3 security levels:
  - None-authorization only
  - Integrity-attaches digital signatures to messages
  - Privacy-encrypt/decrypt
- Exploits System z cryptographic processor
- Simple upgrade on top of WebSphere MQ
  - Intercepts application message before it enters/leaves queues



A Communications Backbone on System z Benefits From Systematic Disaster Recovery

- Leverages Geographically Dispersed Parallel Sysplex (GDPS) capabilities in case of a data center disaster
  - Capacity backup to support critical workloads
  - Disk mirroring avoids message loss
  - Automated scripts drive automatic failover



Summary

IBM's communication backbone solution provides the availability, scalability, and security I need

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