Appliances and SOA Security; DataPower and Z Integration

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IBM

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Agenda

- DataPower SOA Appliances
  - Products
  - Uses
- DataPower and Z
  - Subsystems
  - Load Distribution and High Availability
  - Security
  - Management
  - Tooling
- Summary

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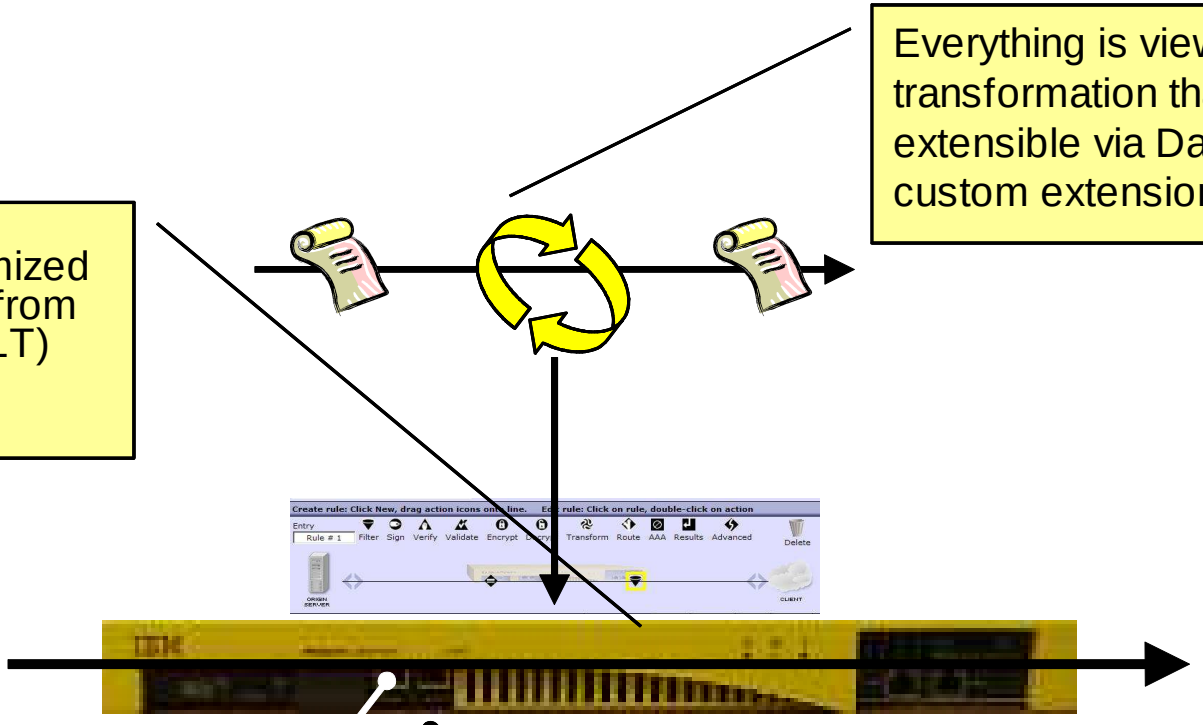
DataPower SOA Appliances

Why an Appliance for SOA?

- Integrated
  - Many functions integrated into a single device
  - Addresses the divergent needs of different groups (architects, operators, developers)
  - Integrates well with other IBM SWG and standards-based products
- Hardware reliability
  - Dual power supplies, no spinning media, self-healing capability, failover support
- Security
  - Higher levels of security assurance certifications require hardware (HSM, government criteria)
  - Inline application-aware security filtering and intrusion protection
- Higher performance with hardware acceleration
  - Wire-speed application-aware parsing and processing
  - Ability to perform costly XML security operations without slow downs
- Consumability
  - Simplified deployment and management: up in minutes, not hours
  - Reduces need for in-house SOA skills & accelerates time to SOA benefits

DataPower Architecture



Everything is viewed as a transformation that is extensible via DataPower custom extension functions

Specialized compiler technology creates optimized executable object code from transformations (eg. XSLT) that execute natively on hardware

High-performing throughput-optimized engine yields wire-speed capabilities

Purpose-built hardware to execute SOA workloads and transformations

DataPower SOA Appliances Product Family

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Low Latency Appliance XM70

- High volume, low latency messaging
- Enhanced QoS and performance
- Simplified, configuration-driven approach to LLM
- Publish/subscribe messaging
- High Availability

B2B Appliance XB60

- B2B Messaging (AS2/AS3)
- Trading Partner Profile Management
- B2B Transaction Viewer
- Unparalleled performance
- Simplified management and configuration

Integration Appliance XI50

- Hardware ESB
- "Any-to-Any" Conversion at wire-speed with WTX
- Bridges multiple protocols
- Integrated message-level security

XML Security Gateway XS40

- Enhanced Security Capabilities
- Centralized Policy Enforcement
- Fine-grained authorization
- Rich authentication

Advantages of a DataPower Blade

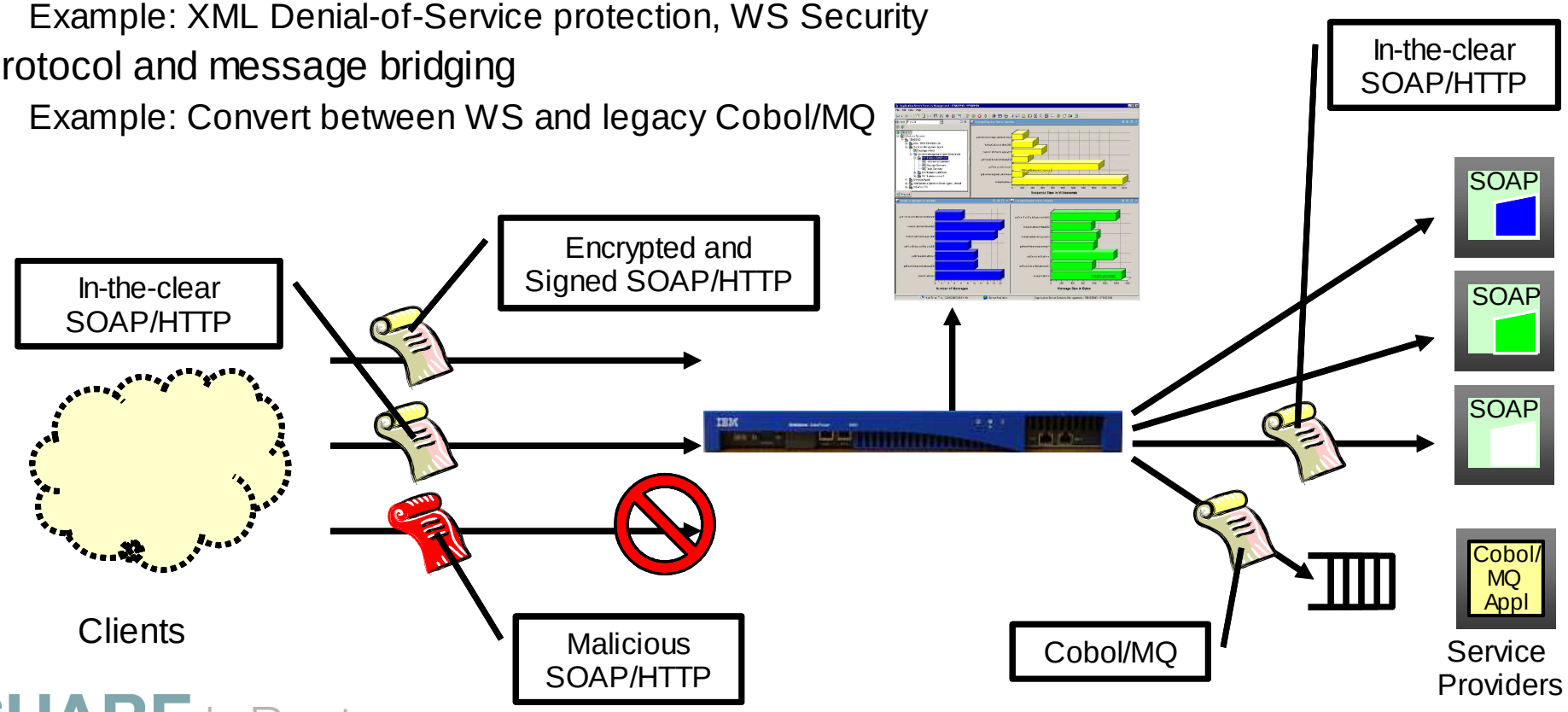
- First-class support of new features: IPv6, 10GigE, XG4NG
- Increased load distribution and high availability options for optimized application support
- Configuration transparency: 1U and blade
- Opportunities for additional future integration

DataPower XI50

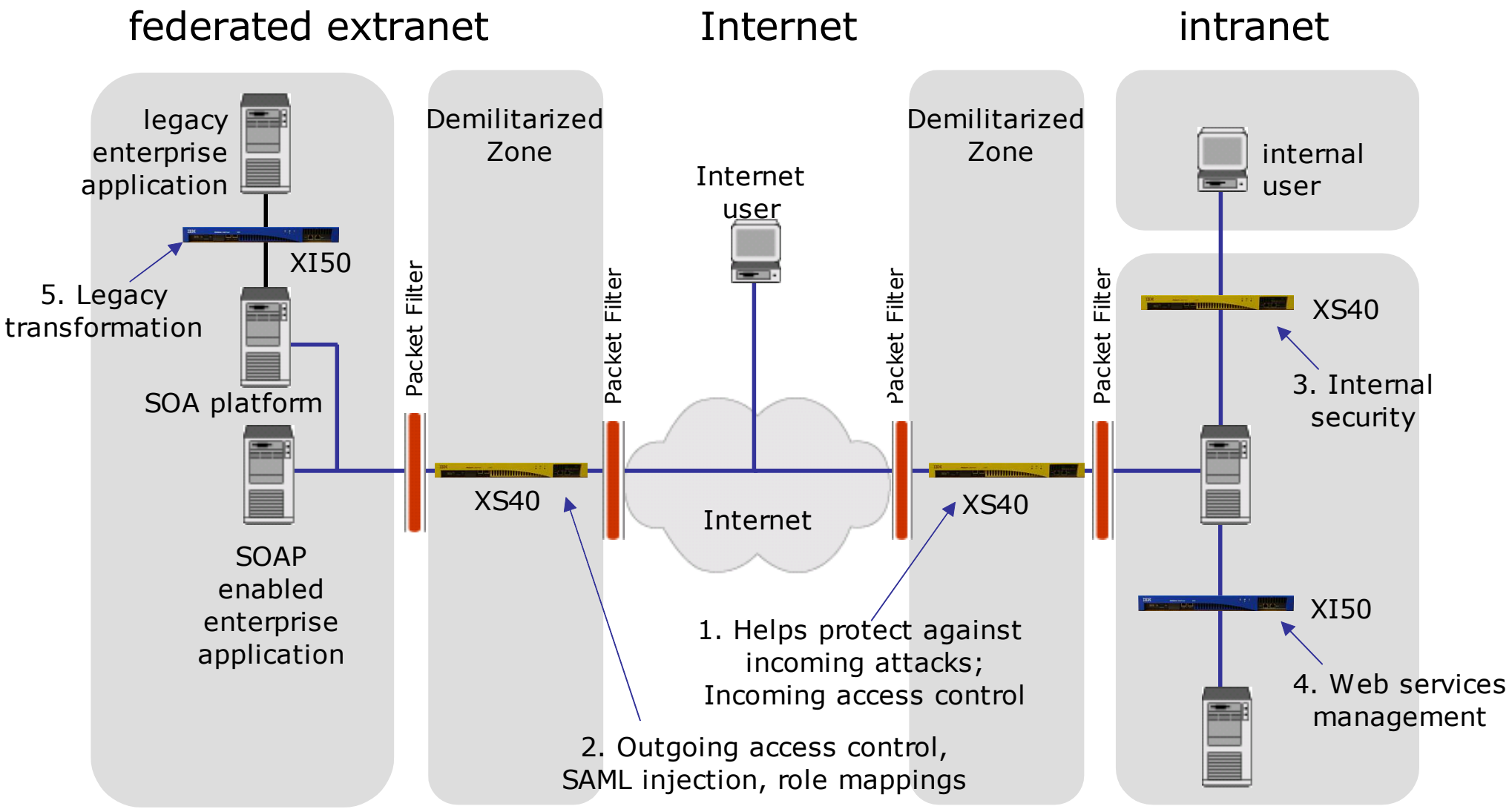
DataPower XI50B Blade Appliance

Use Cases

- Monitoring and control
  - Example: centralized ingress management for all Web Services using ITCAM SOA
- Deep-content routing and data aggregation
  - Example: XPath (content) routing on Web Service parameters
- Functional acceleration
  - Example: XSLT, WS Security
- Application-layer security and threat protection
  - Example: XML Denial-of-Service protection, WS Security
- Protocol and message bridging
  - Example: Convert between WS and legacy Cobol/MQ



Deployment Scenarios



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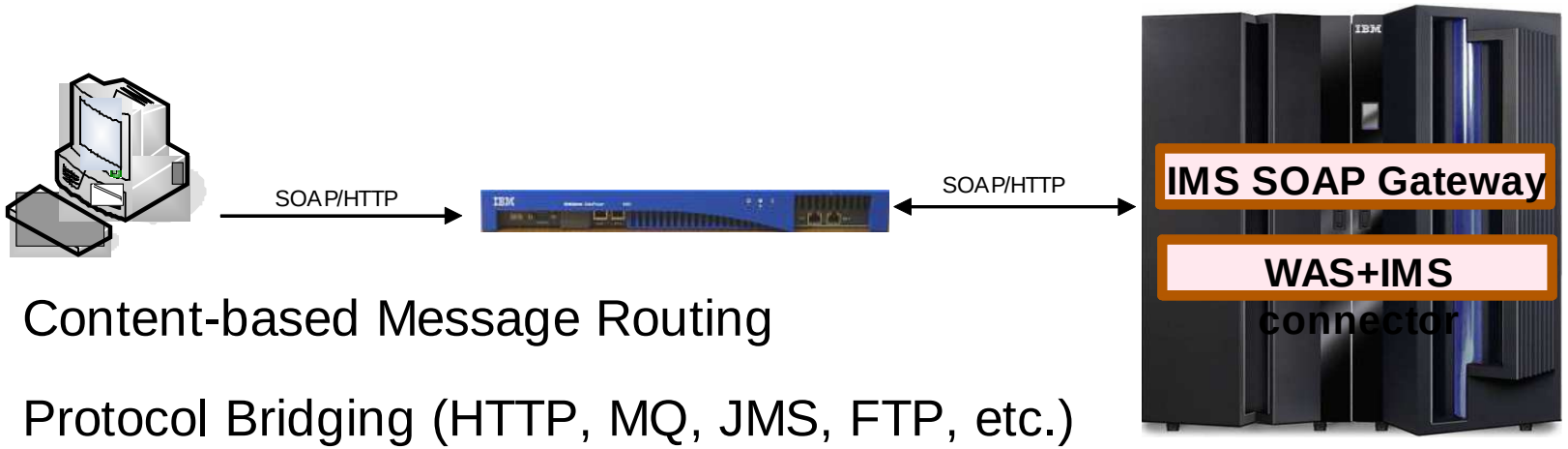
DataPower and Z: Subsystem Integration

Integration Goals

- Enable Web Services interfaces to z Subsystems
- Enhance communication mechanisms and intelligence
  - Load distribution and high availability choices and optimizations
- Allow integrated and centralized security
  - Promote System z as the enterprise-wide security focal point
- Integrated system administration and monitoring
- Holistic approach focusing on all aspects of the SOA Lifecycle
- Unified map tooling
  - Used to build binary transformations, e.g. Cobol Copybook

IMS Integration (1)

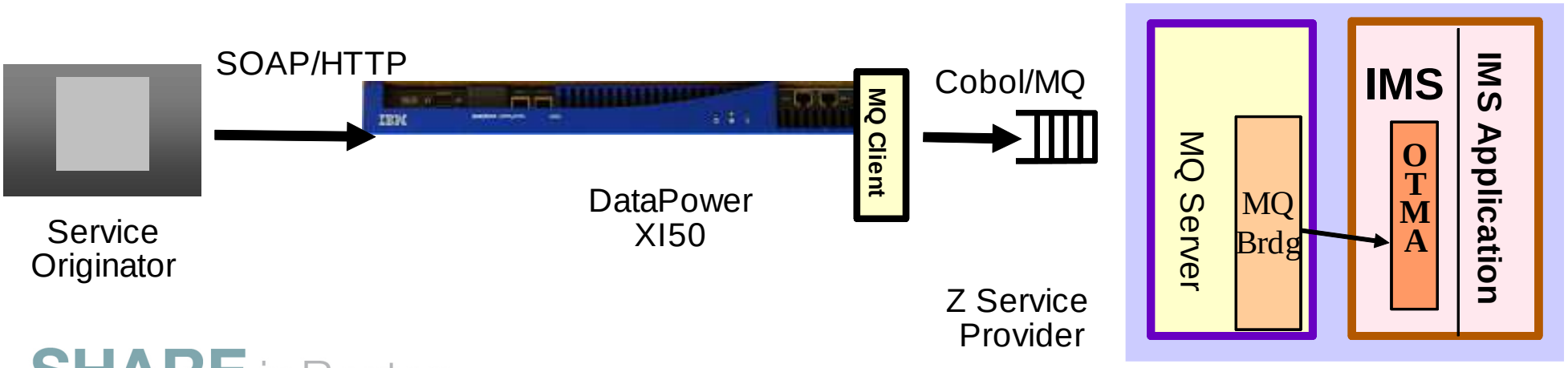
Web Services Security and Management for IMS Web services



- Content-based Message Routing
- Protocol Bridging (HTTP, MQ, JMS, FTP, etc.)
- XML/SOAP Firewall
- Data Validation
- Field Level Security
- XML Web Services Access Control/AAA
- Web Services Management

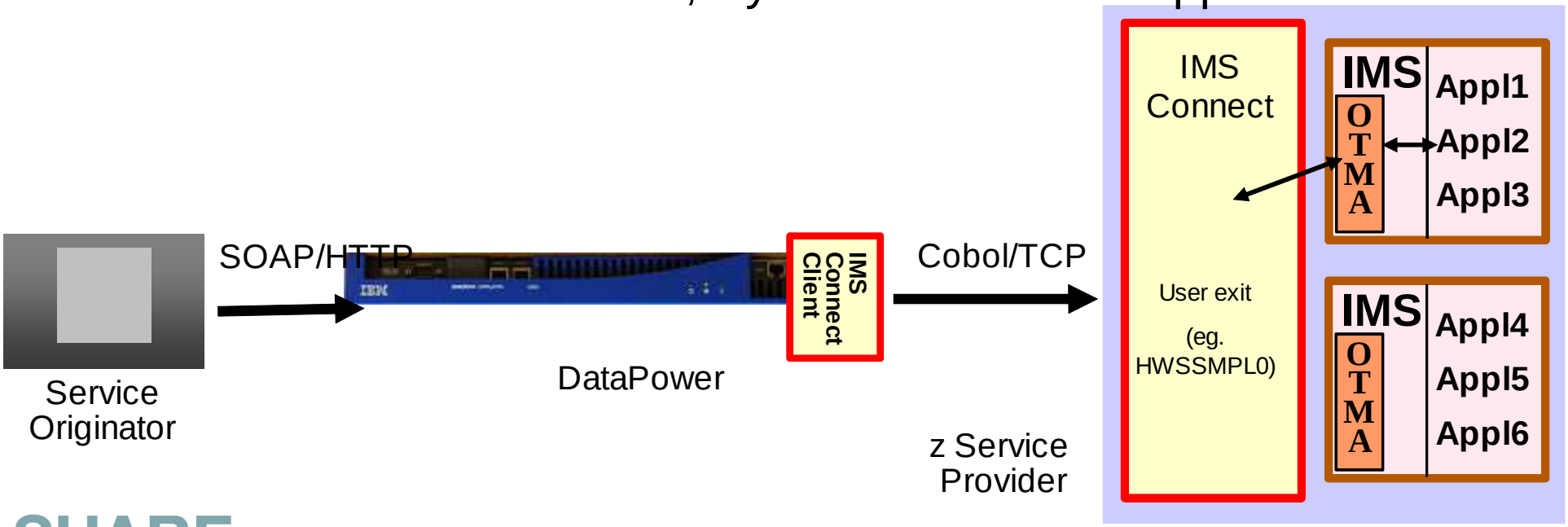
IMS Integration (2)

- DataPower provides WS-enablement to IMS applications
- Customer codes schema-dependent FFD or WTX data map to perform request/response mapping
- This is the preferred way to WS-enable IMS applications
- Requires MQ
  - MQ bridge to access IMS
  - MQ client is embedded in DataPower
  - Some push back against MQ requirement due to cost and complexity issues



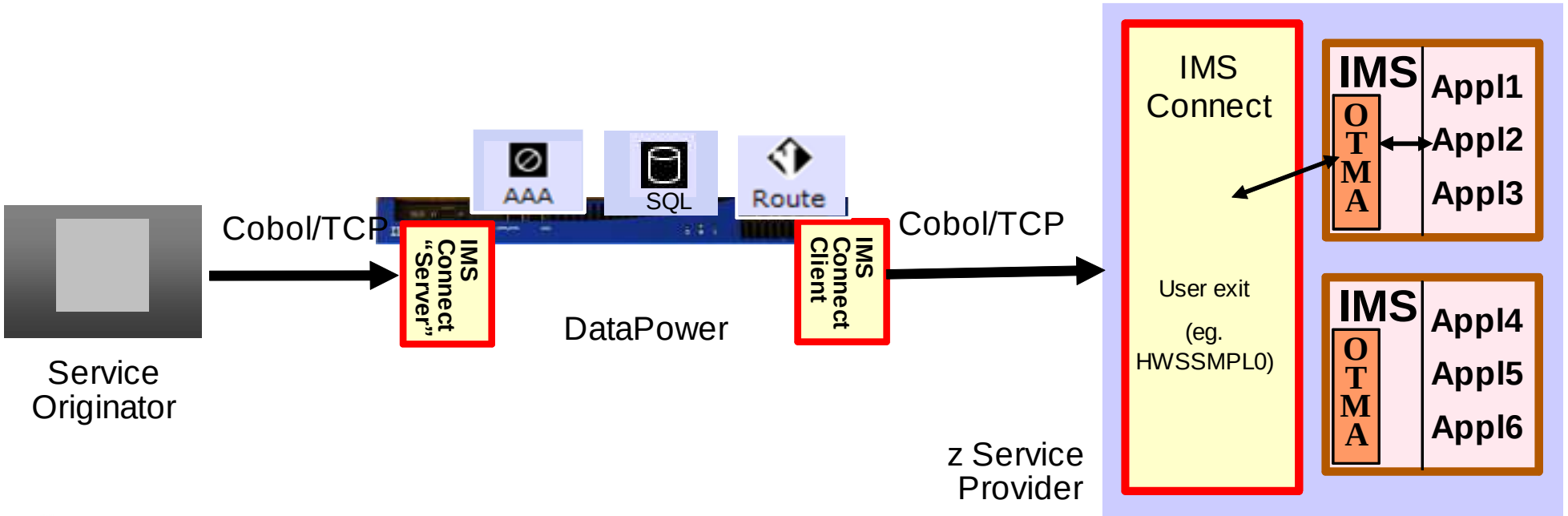
IMS Integration (3): WS-Enablement

- Remove MQ requirement
  - MQ still best alternative for scenarios requiring transactional support
  - IMS has few alternatives (IMS SOAP Gateway is an entry-level solution)
- "IMS Connect Client" (back-side handler) natively connects to IMS Connect using its custom request/response protocol
- 3.8.0 adds: Automatic chunking and de-chunking
- 3.8.1 adds: Commit mode 1, Sync level commit support



IMS Integration (4): IMS Proxy

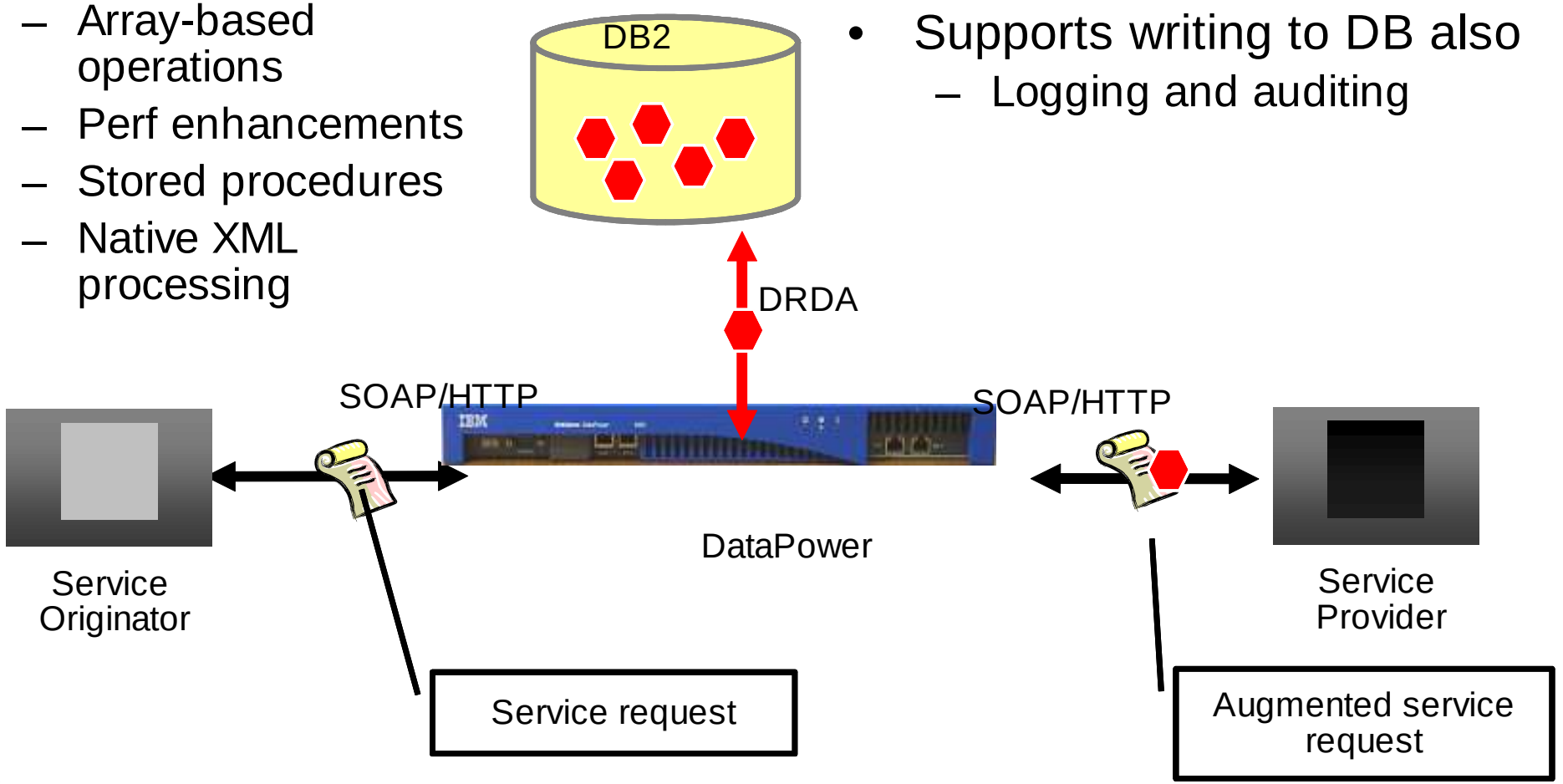
- Bring DataPower value add to standard IMS connect usage patterns
- Provide an “IMS Connect Client” on DataPower that natively connects to IMS Connect
- Provide an “IMS Connect Server” on DataPower that accepts IMS Connect client connections and provides an intermediation framework that leverages DataPower
  - Enables authentication checks, authorization, logging, SLM, transformation, route, DB look-up, SSL offload, etc.



DB2 Integration (1)

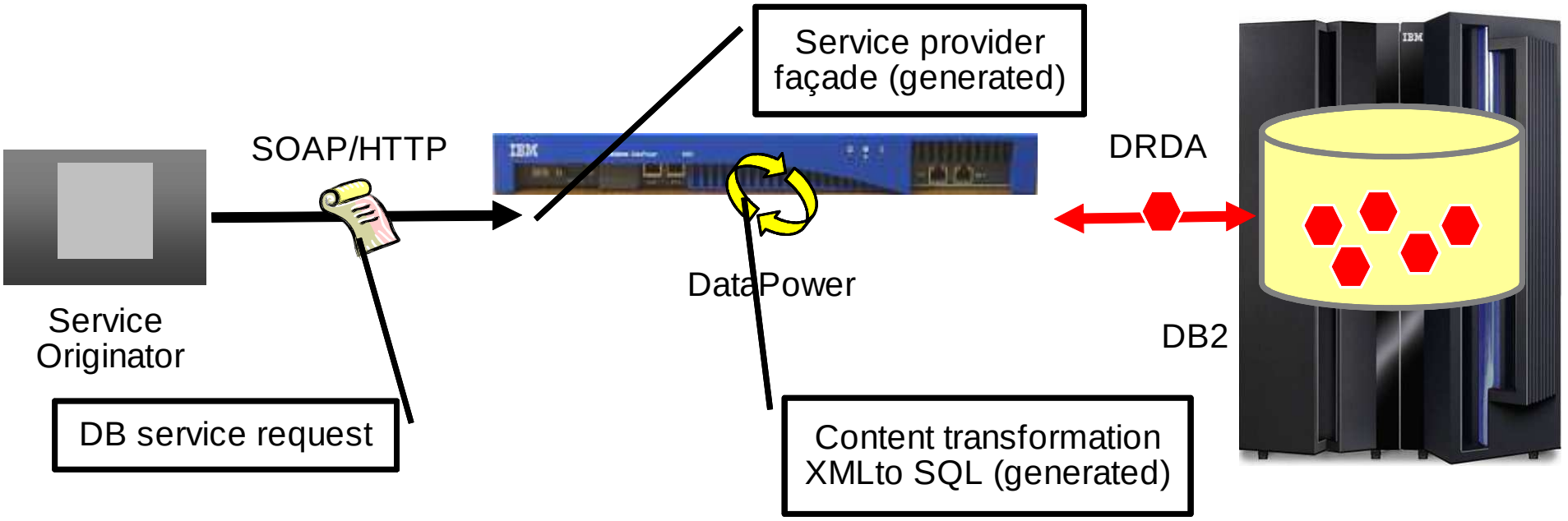
- Supports DB2, Oracle, Sybase, Microsoft
  - Parameter marking
  - Array-based operations
  - Perf enhancements
  - Stored procedures
  - Native XML processing

- Web service requests are augmented with information from the database (message enrichment)
- Supports writing to DB also
  - Logging and auditing



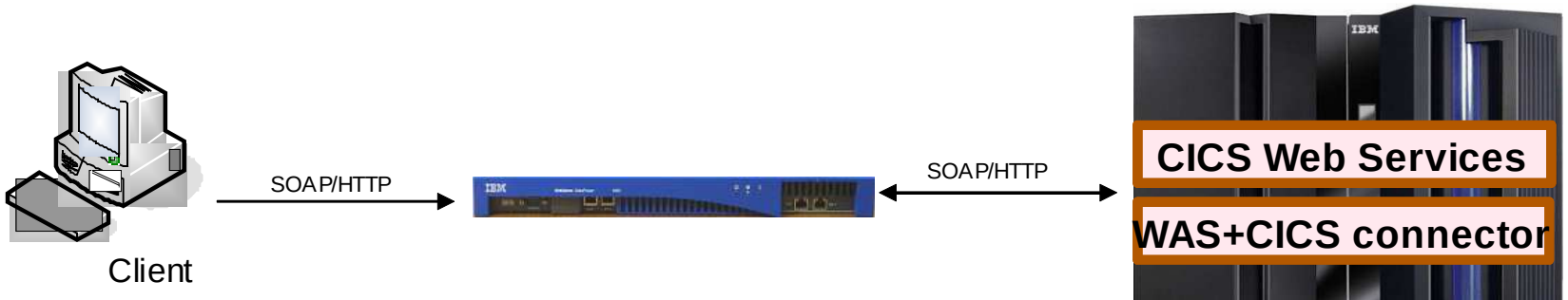
DB2 Integration (2)

- A standard WS façade to DB/2
  - Common tool (IBM Data Studio 1.2) generates WSDL and data mapping in both Data Web Services runtime and DataPower
  - SOAP call is mapped to an ODBC (DRDA) invocation
- Exposes database content (information) *as a service*



CICS Integration (1)

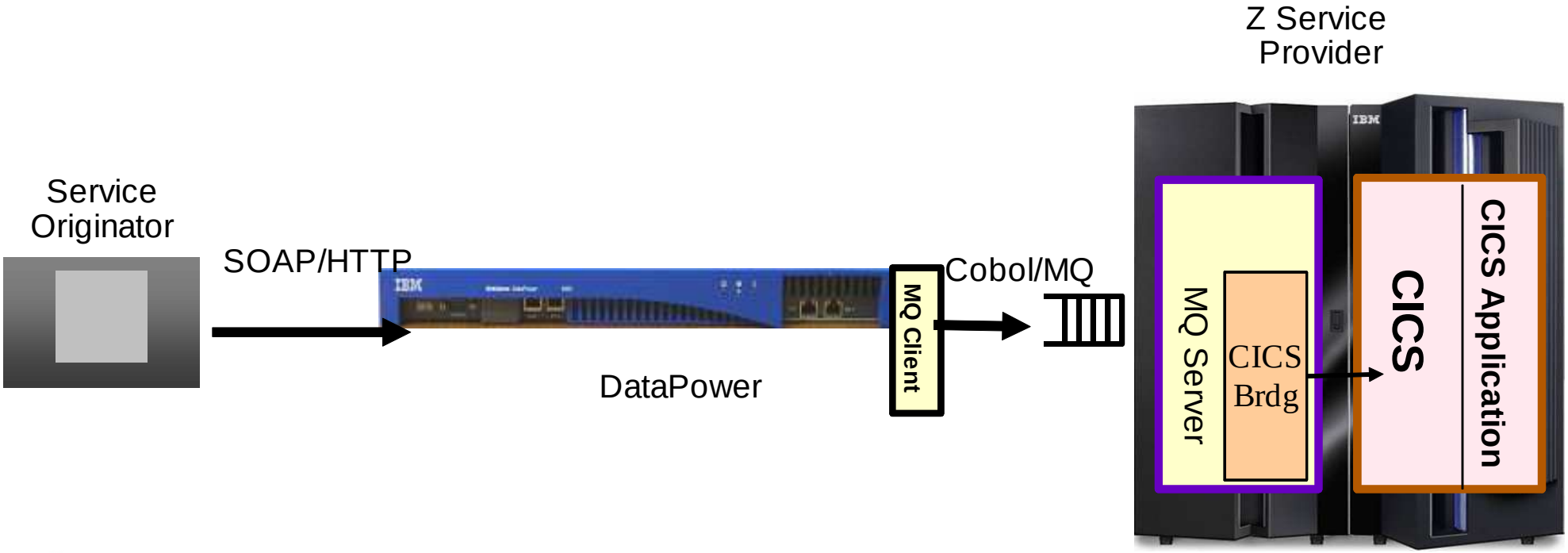
Web Services Security and Management for CICS Web services



- Content-based Message Routing
- Protocol Bridging (HTTP, MQ, JMS, FTP, etc.)
- XML/SOAP Firewall
- Data Validation
- Field Level Security
- XML Web Services Access Control/AAA
- Web Services Management
- 3.8.0 adds: ID propagation

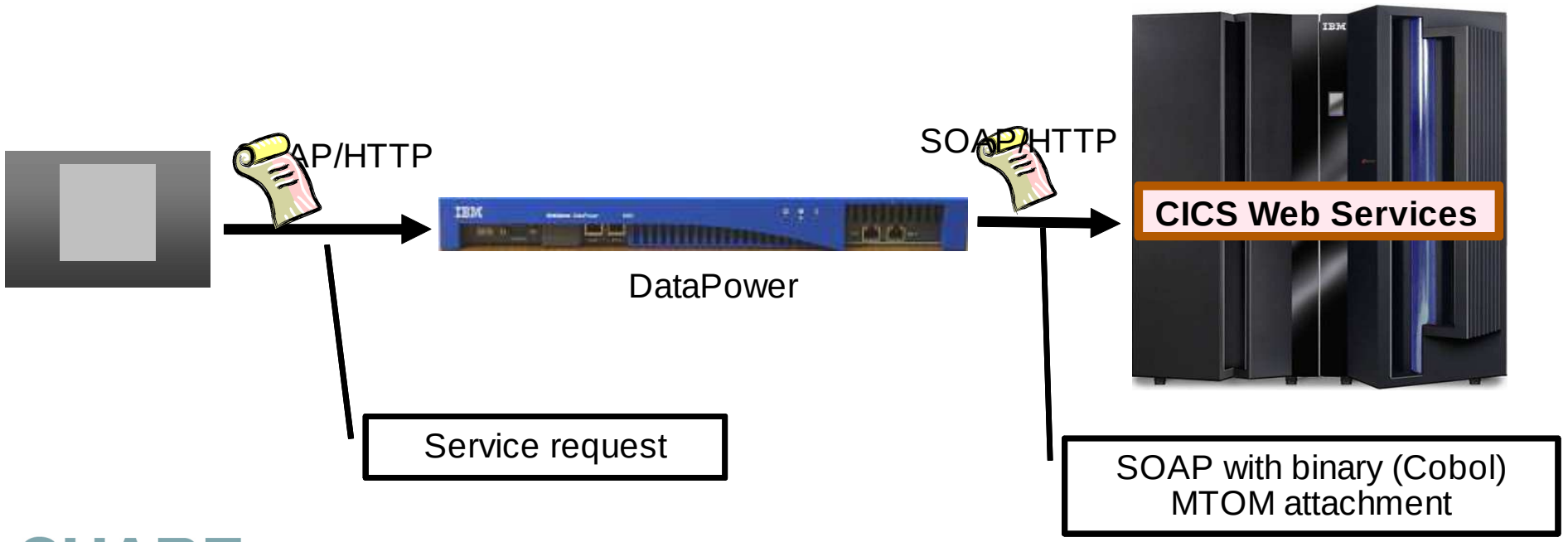
CICS Integration (2)

- DataPower provides WS-enablement to CICS
- Customer codes schema-dependent XSL/FFD/WTX to perform request/response mapping
- Requires MQ
  - MQ bridge to access CICS
  - MQ client capability is embedded in DataPower



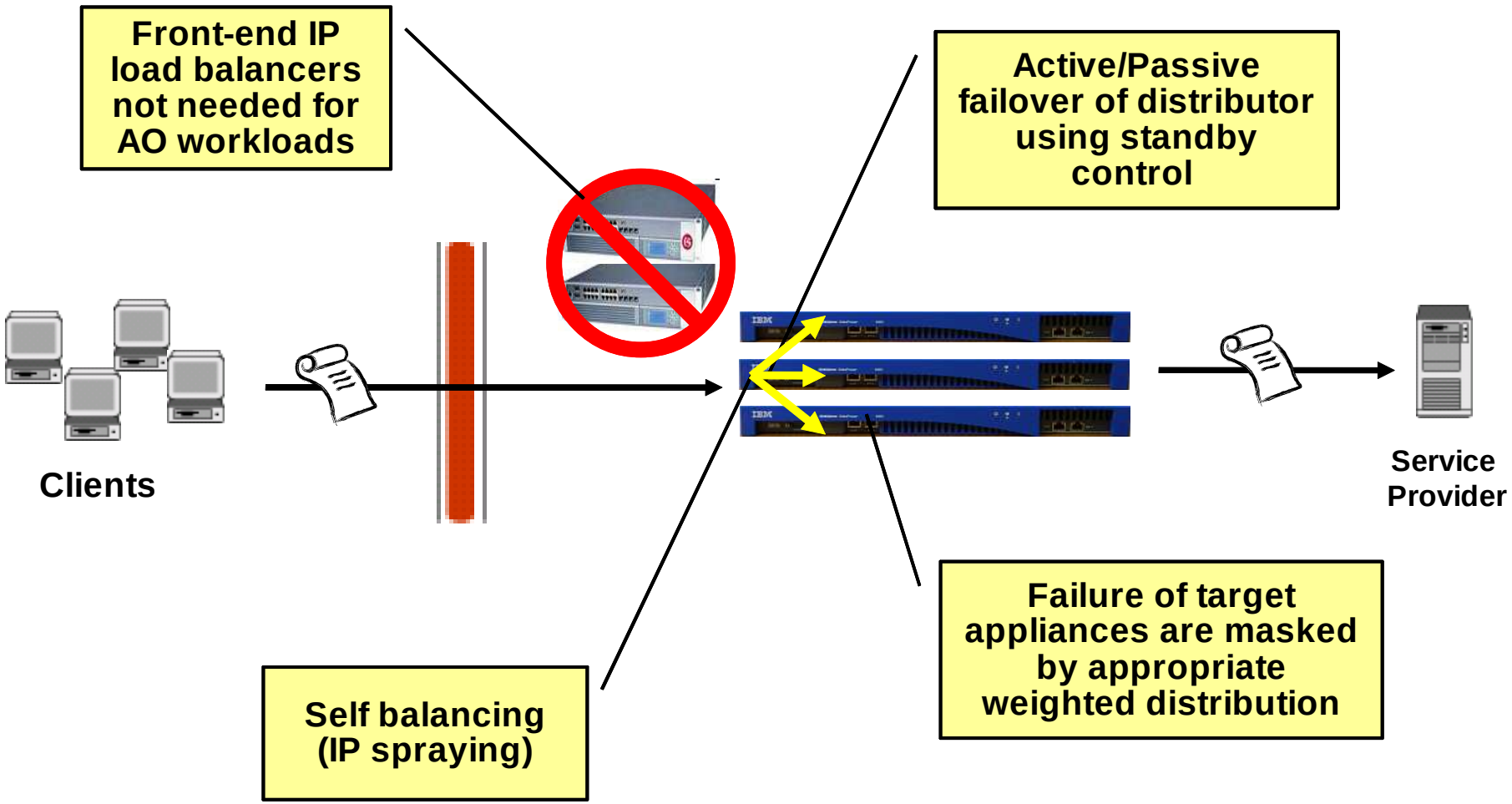
CICS Integration (3)

- DataPower provides WS Security, XDoS to CICS WS back-end
- User creates schema-dependent transform to perform request/ response mapping
- Payload transformation is pushed to DataPower
- SOAP Header information required at CICS WS back-end for correct operations, e.g. WS-AtomicTransactions



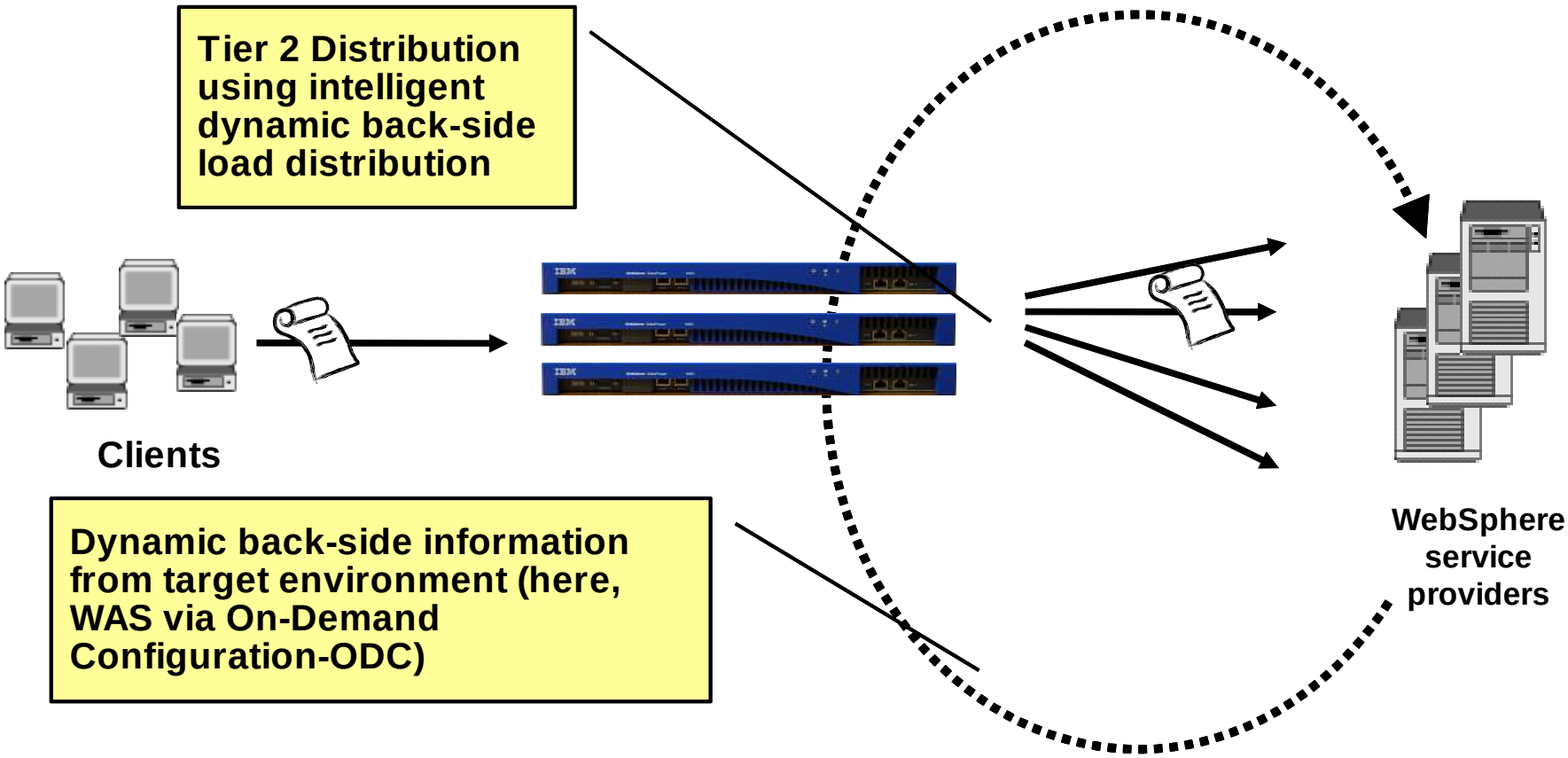
DataPower and Z
Load Distribution and HA

Application Optimization (AO): Self-Balancing and high availability HA of Appliances

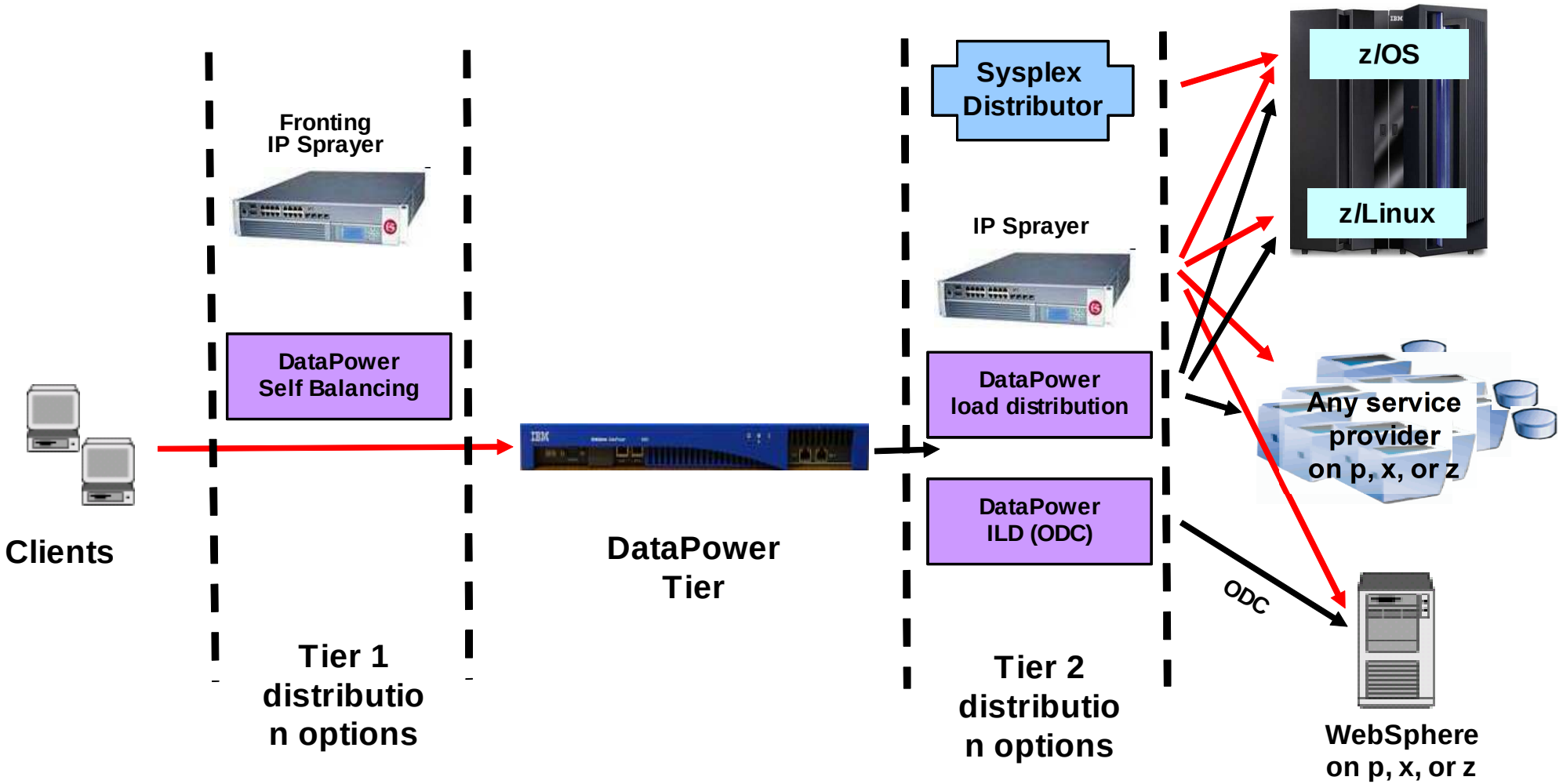


AO Intelligent Load Distribution (ILD)

- Request distribution, *not* connection distribution
  - This provides better distribution under persistent connections
- Today: WAS ND and VE are supported

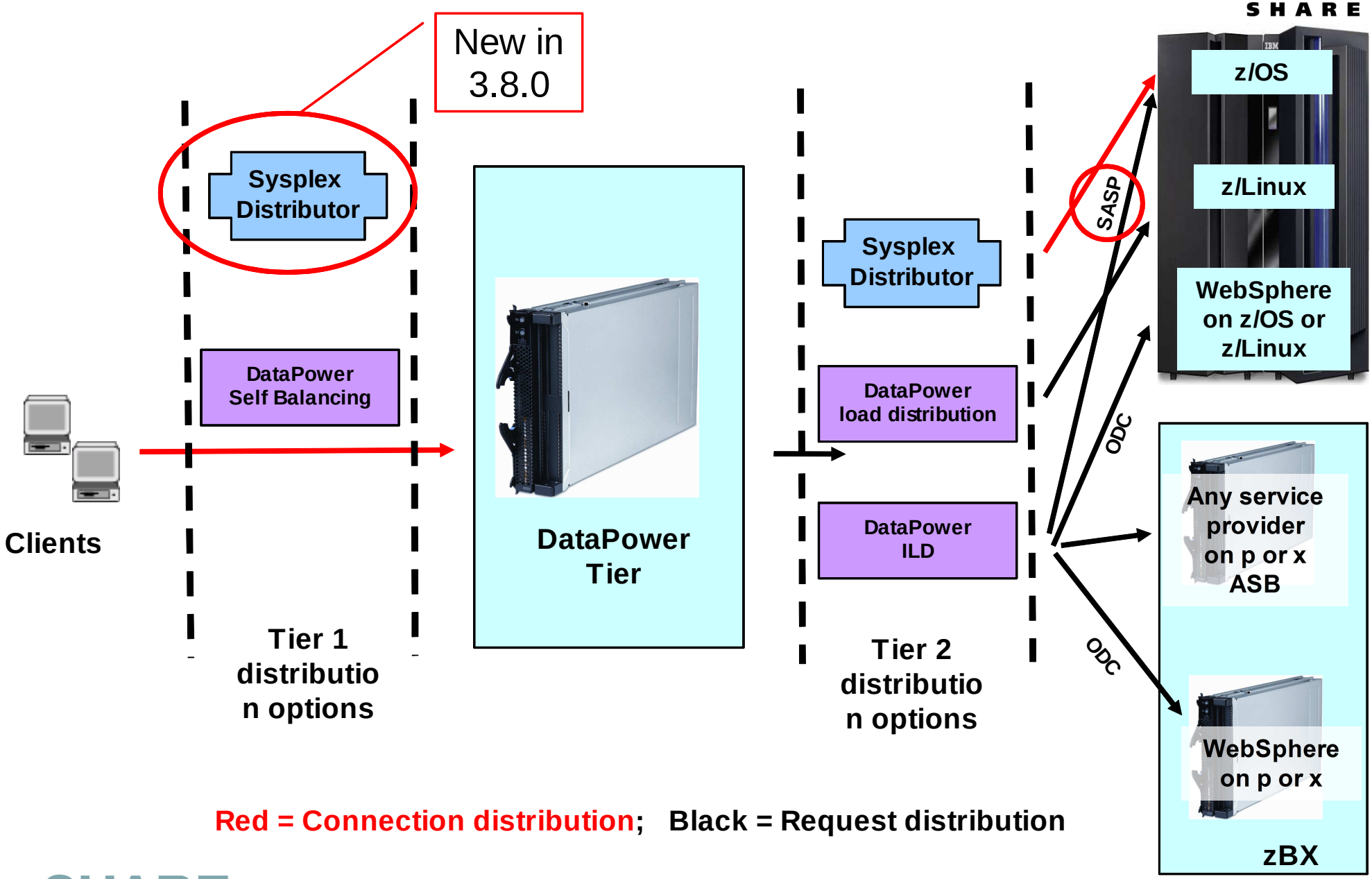


Distribution and HA Options Today



Red = Connection distribution; Black = Request distribution

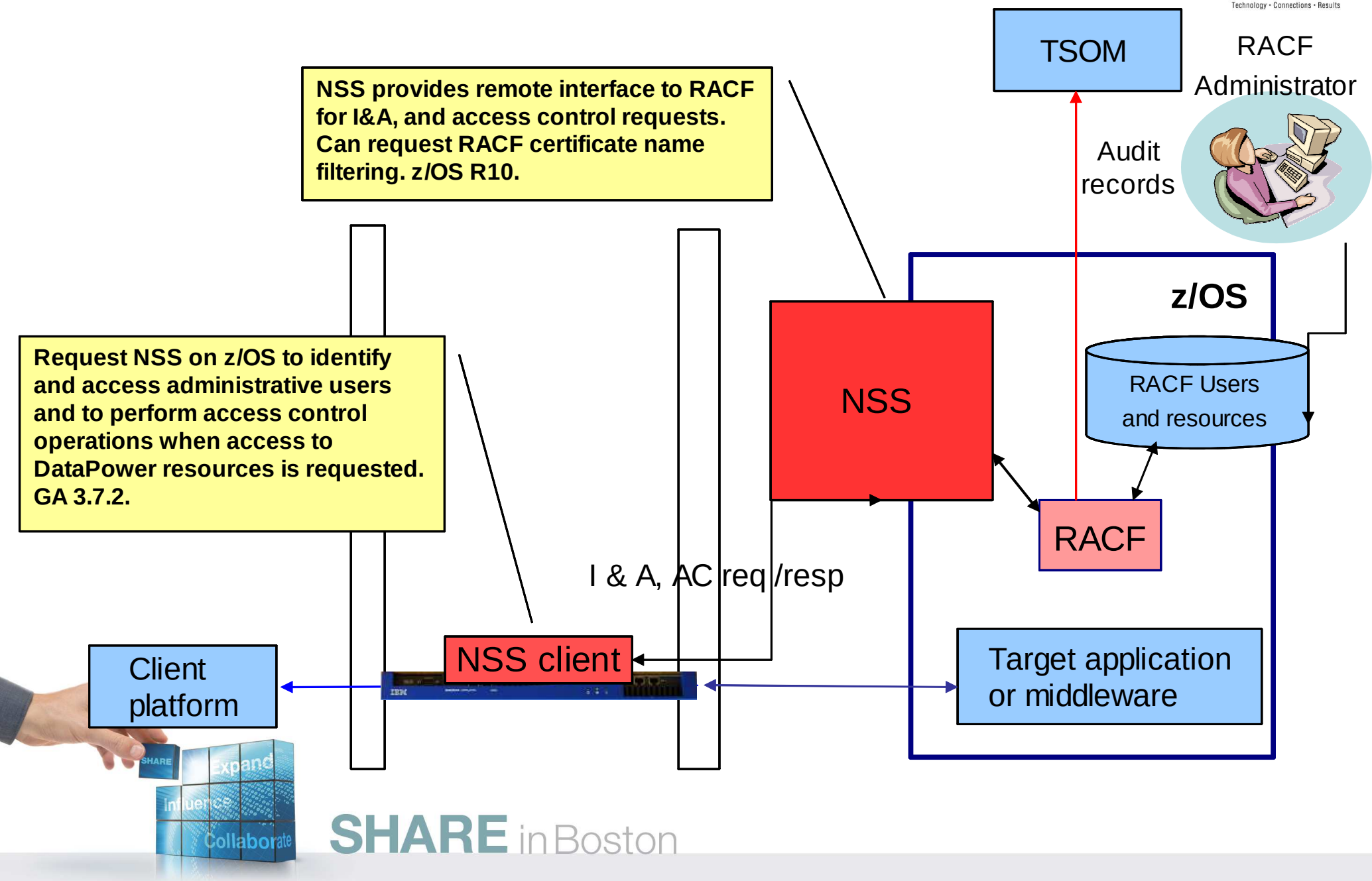
Emerging Distribution and HA Strategies



Red = Connection distribution; Black = Request distribution

DataPower and Z: Security Integration

Remote SAF Security Integration



Crypto Integration

NSS performs requested key operation using certificates and keys stored in RACF

Request NSS on z/OS to perform operations that require access to RACF keyring. This includes signing, validating signatures during security initialization, key unwrapping, and key downloading.

z/OS

Network Security Services

RACF Keyring

RACF

NSS Key req /resp

TLS Endpoints

NSS client

Datapower XS40

Client

Target application or middleware

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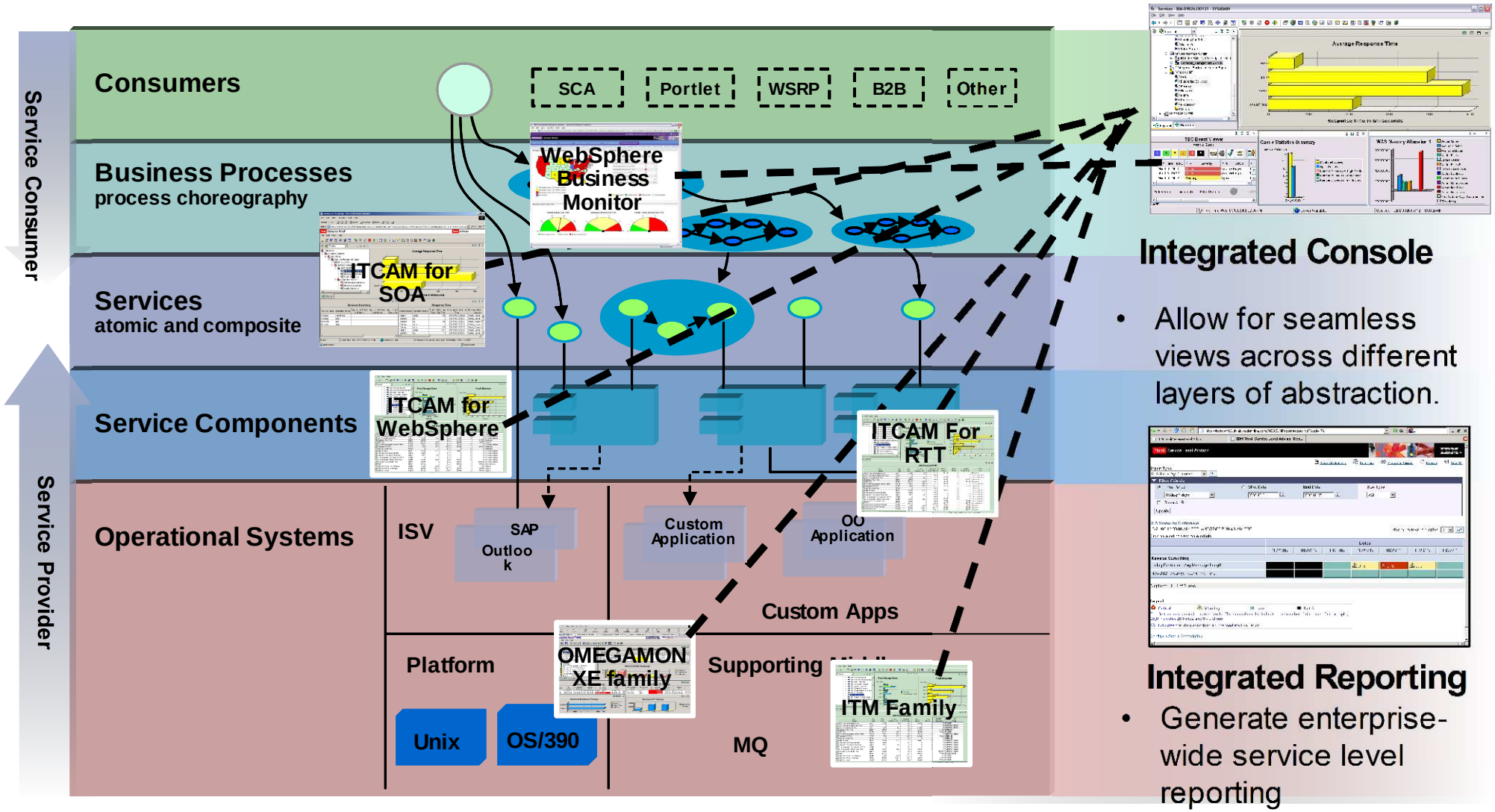
DataPower and Z: Management Integration

Management Integration

- Monitoring - many different “levels” of monitoring, all are important
  - System-level monitoring (CPU, memory, SNMP)
  - Service-level monitoring (WS, SOAP, WSDM)
  - Business-level monitoring (Key performance indicators, BPEL)
- Operational management
  - Configuration lifecycle management: Need to manage disparate configuration assets in the deployment lifecycle (development through production)
  - Control firmware upgrades
- Runtime management
  - How can we dynamically configure and affect DataPower in collaboration with other runtimes in our enterprise?
  - Peer-to-peer approach vs policy-driven approach: both are important

Monitoring Overview

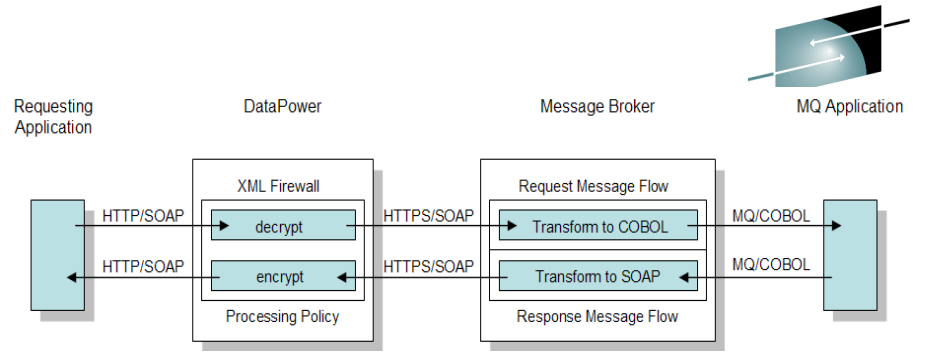


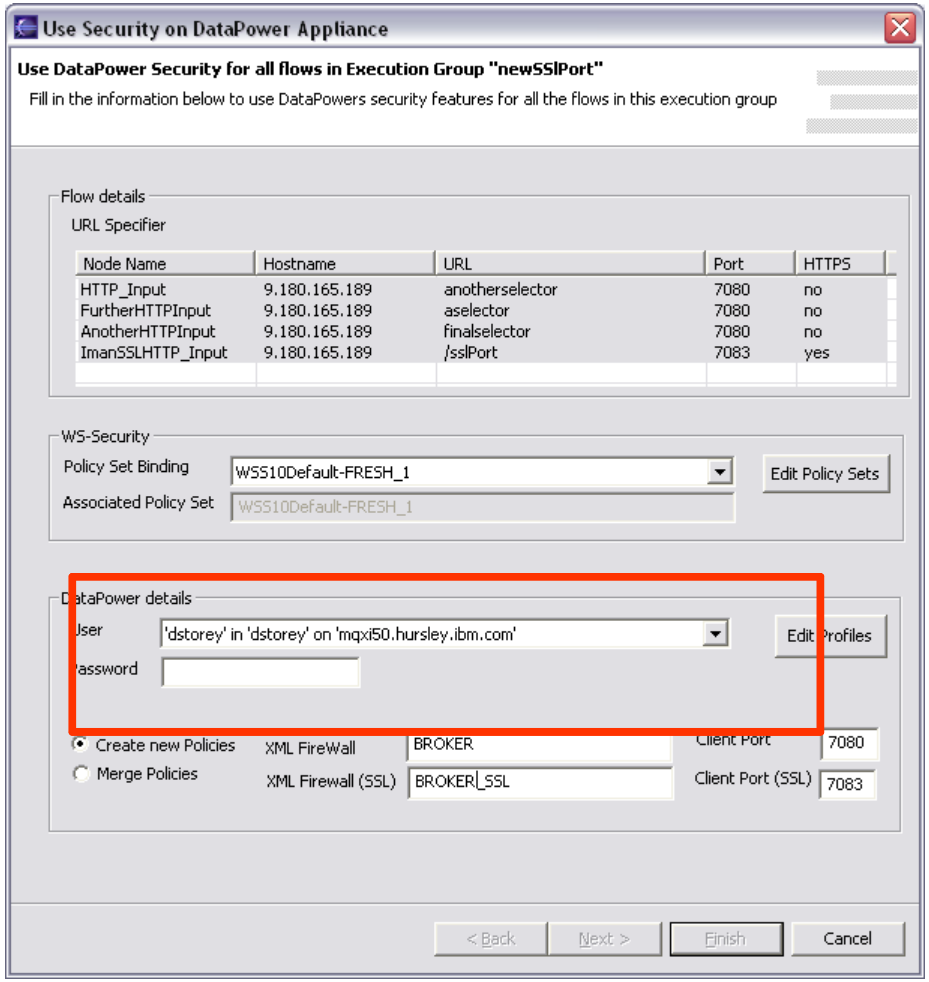
Thoughts on Operational Management

- Configuration management is an integral part of the Appliance Development Lifecycle
- Appliance Management Protocol (AMP) provides an appliance-generic SOAP interface for configuration deployment and firmware governance
  - Built on the notion of a configuration (domain) package (export)
  - Example: Full-device backup and restore primitive
- DataPower Management Interface (DeMI) is a java based component that provides consistent higher level functions for broader multi-appliance management support
  - DeMI is embedded in WAS and ITCAMSE

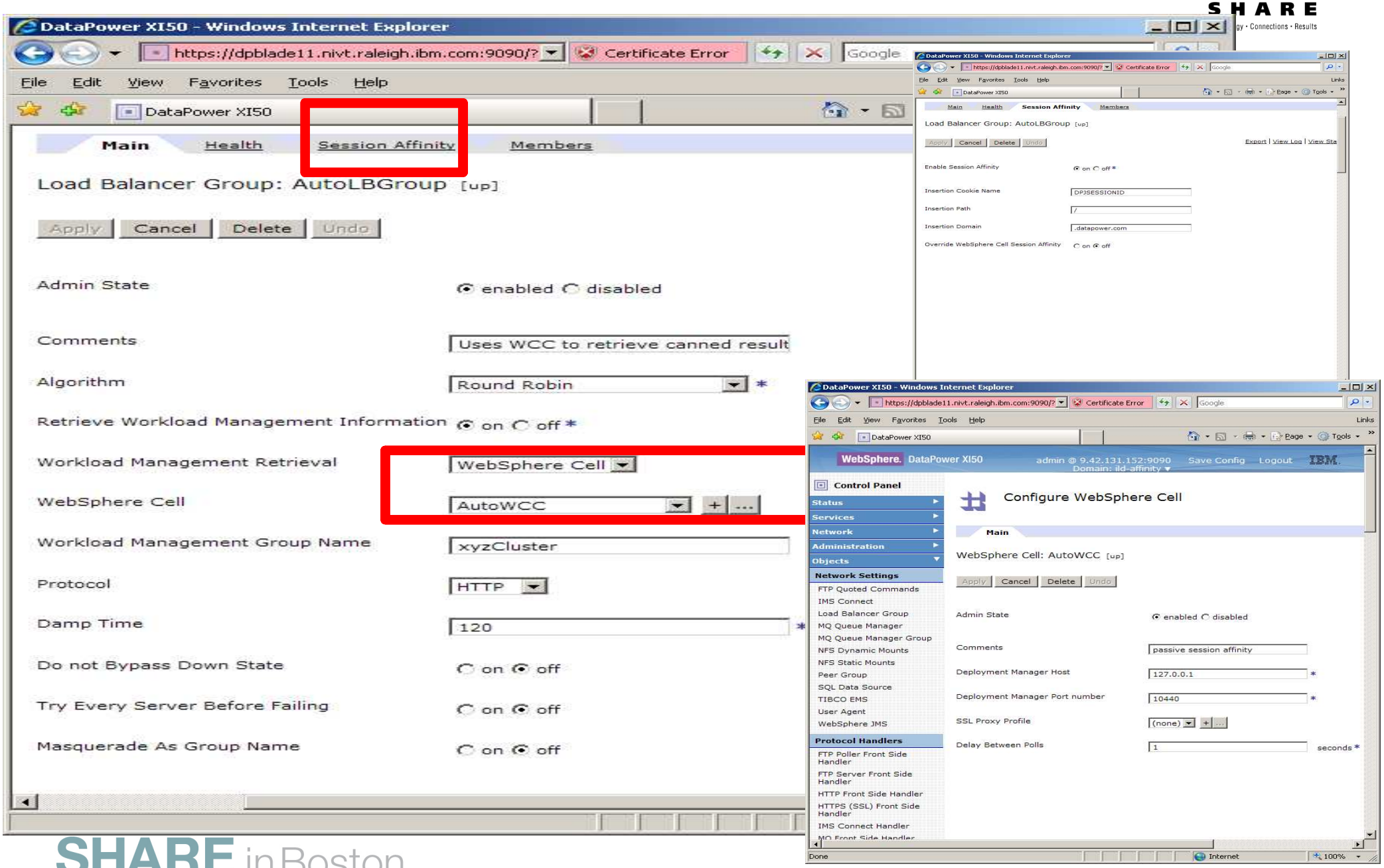
DataPower and WMB

- Exploit DataPower for WS Security
  - Single tool and security policy description
  - Security best practices
    - WS-Security at appropriate point in topology
    - Built-in XML threat protection; Hardened device
  - Built-in service level management
    - Manage traffic using policy; WSDM and WS-Man
  - Scale as volumes increase
    - Enhanced performance with SOA appliance
    - Add capacity when necessary
- Administration User Experience
  - Operational reconfiguration only
  - Applications and Message Flows unchanged
  - Right click on flow and select “Use DataPower”
    - DataPower performs WS-Security processing
    - Forwards processed request to MB



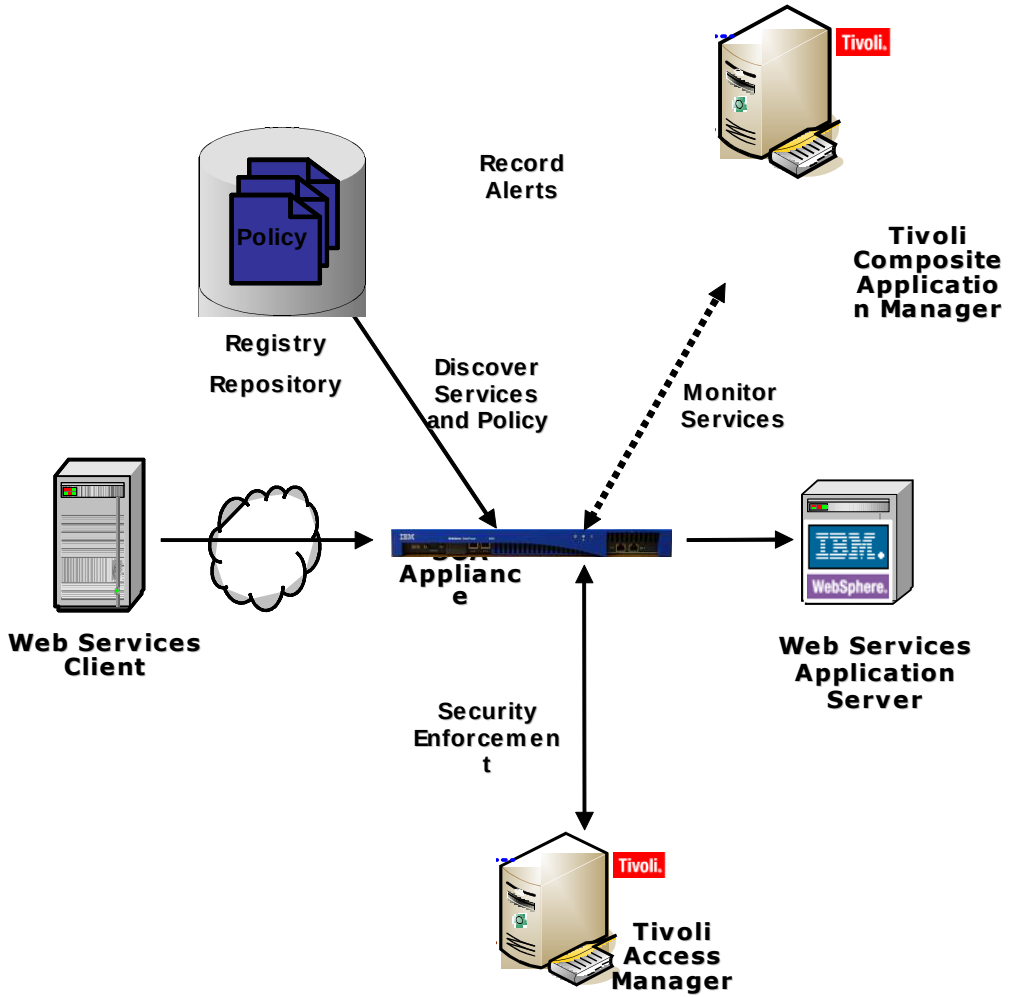


AO Dynamic WebSphere Configuration



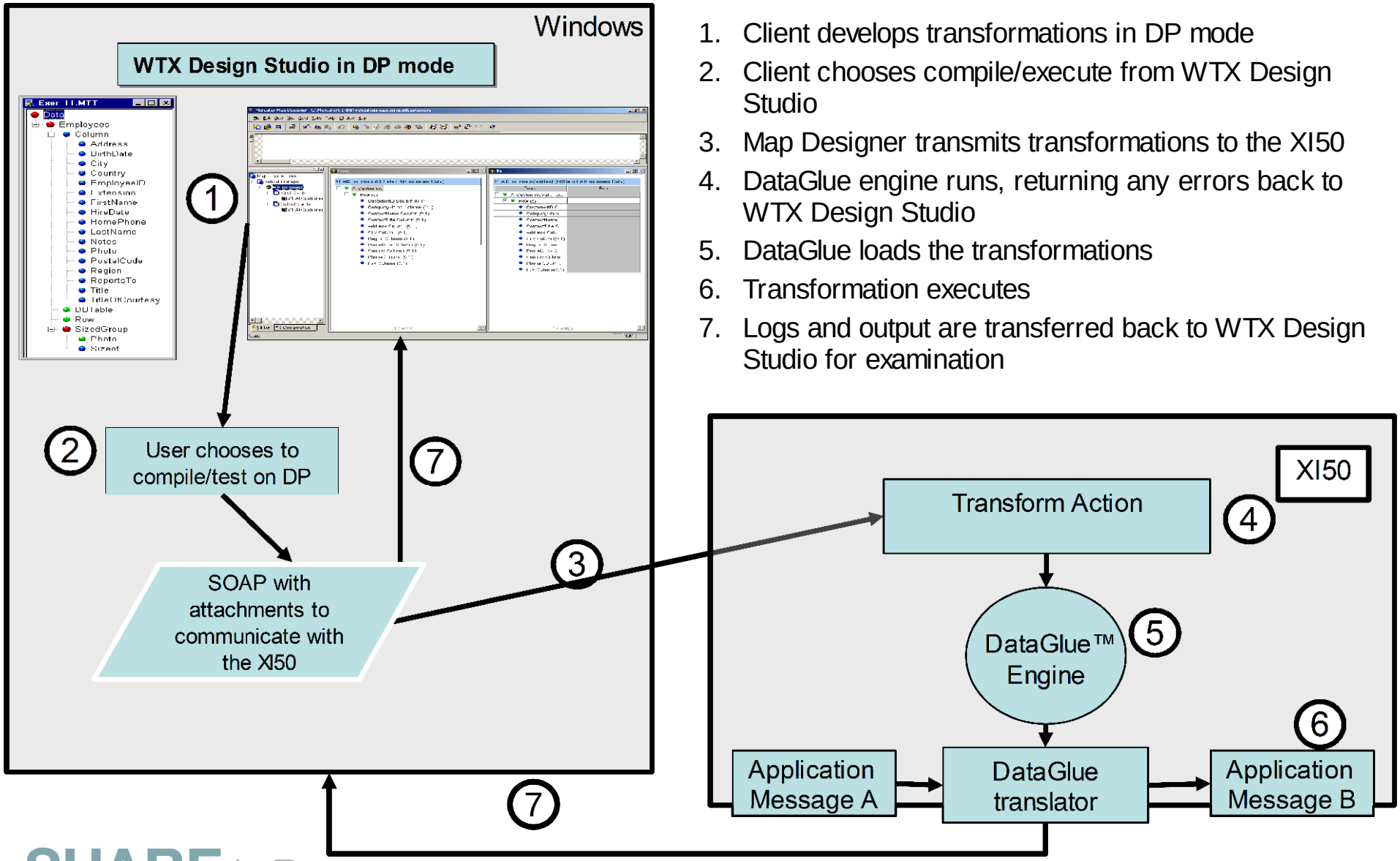
Web Services Registry and Repository

- Use of a central repository can facilitate Discovery and Reuse of Web services:
  - WSRR and UDDI supported today
- Artifacts can be stored, updated via repository
- Push/Retrieve configuration of new services to DataPower for enforcement
- Policy and Security enforcement for SOA Governance on DataPower
- Direction: Increased types of Policy (e.g. QoS/SLA)



DataPower and Z: Tooling

WTX Design Studio Integration

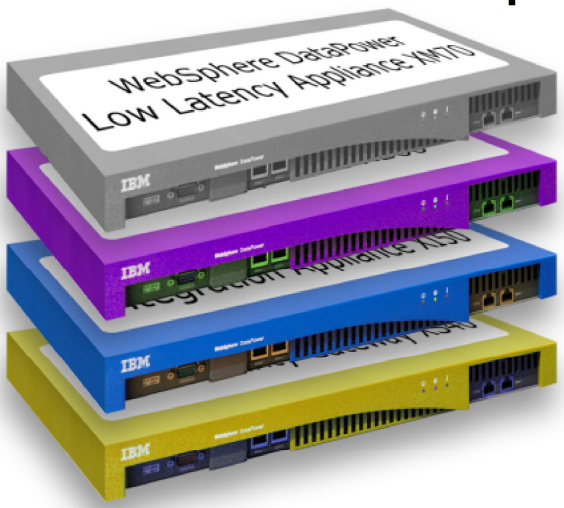


1. Client develops transformations in DP mode
2. Client chooses compile/execute from WTX Design Studio
3. Map Designer transmits transformations to the XI50
4. DataGlue engine runs, returning any errors back to WTX Design Studio
5. DataGlue loads the transformations
6. Transformation executes
7. Logs and output are transferred back to WTX Design Studio for examination

Summary – IBM SOA Appliances and System z

- DataPower improves System z resources
- Integration increases collaborative synergy across DataPower and z platforms
- Broad integration with System z
  - Subsytem: Higher performance with hardware acceleration
  - Networking: Comprehensive load distribution and HA options
  - Security: Higher levels of security assurance certifications require hardware
  - Management: Simplified deployment and ongoing management
  - Tooling: Consistent tooling across IBM product family

http://www.ibm.com/software/integration/datapower/



SOA Appliances: Creating customer value through extreme SOA performance and security

- **Simplifies** SOA with specialized devices
- **Accelerates** SOA with faster XML throughput
- **Helps secure** SOA XML implementations