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AutoPilot®

Middleware-Centric Application Performance Management

WebSphere User Group UK

30th September, 2014

Royal Society of Edinburgh

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Introduction
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Session Abstract & Agenda

"Transaction Tracking on IBM DataPower SOA Appliances"

- Monitor the health and performance of IBM DataPower
- How to use analytics for proactive diagnostics
- Track messages flows that come through IBM DataPower

Agenda

- Introduction to IBM DataPower SOA appliances
- Collecting metrics from IBM DataPower appliances
- Tracking message flows on IBM DataPower appliances
- Applying Situational Analytics to IBM DataPower Environments
- Conclusion

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VENDOR PROFILE

- Middleware management and "Middleware-centric" application management & monitoring
- Messaging Middleware, Java & .Net Application Servers, ESB's, SOA technologies
- Key value proposition : Identify performance and quality of service issues before business is impacted

CUSTOMERS AND USE CASES

- Large companies, leaders in their markets
- Mission Critical Applications, powered by Middleware
- Trading, Order & Claims Processing, Payments, Funds transfers

KEY DIFFERENTIATORS

- Single point of control for applications running on multiple middleware
- Real-time predictive analytics, policy-driven monitoring, transaction tracking
- Best of breed solution for messaging middleware management

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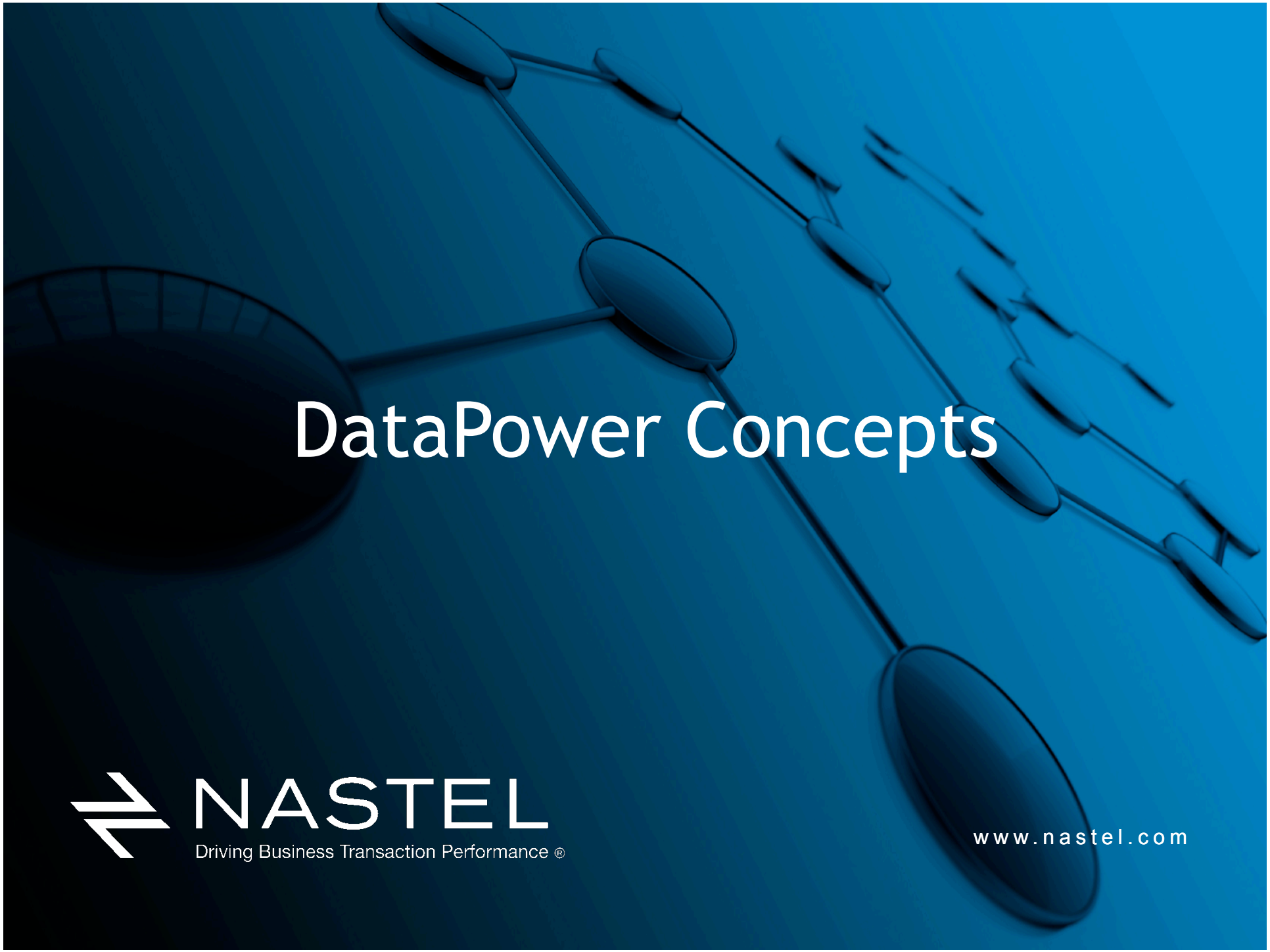
DataPower Concepts
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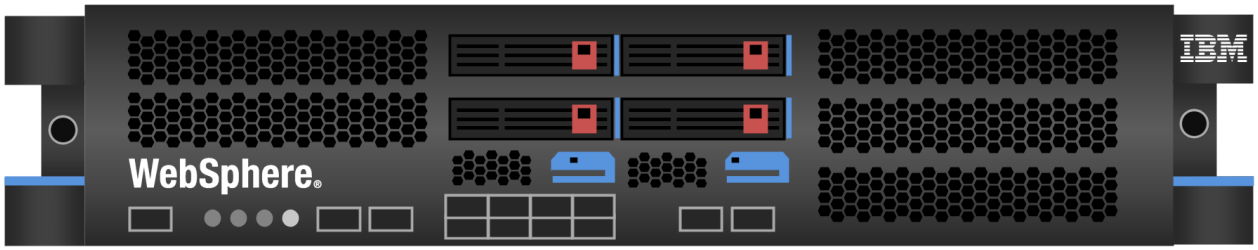
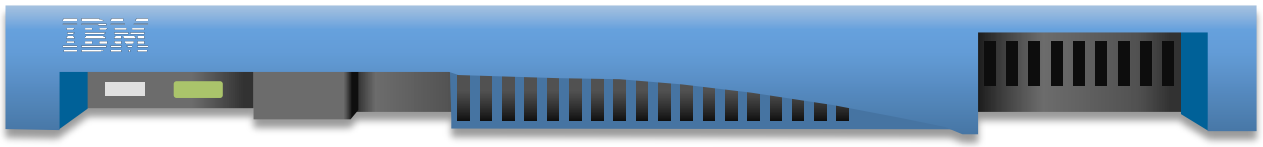
IBM DataPower SOA Appliances

- Addresses 3 challenges of SOA: Ease-of-Use, Security, and Performance
- High performance, firmware-based Enterprise Service Bus
- "Any-to-any" message brokering, transformation and processing
- Integrates any two applications by considering them as services
- Services can be exposed by using different formats and protocols than the ones in which they are implemented
- Protects web services and the architecture behind them from attacks

DataPower Xi52



DataPower Xi50



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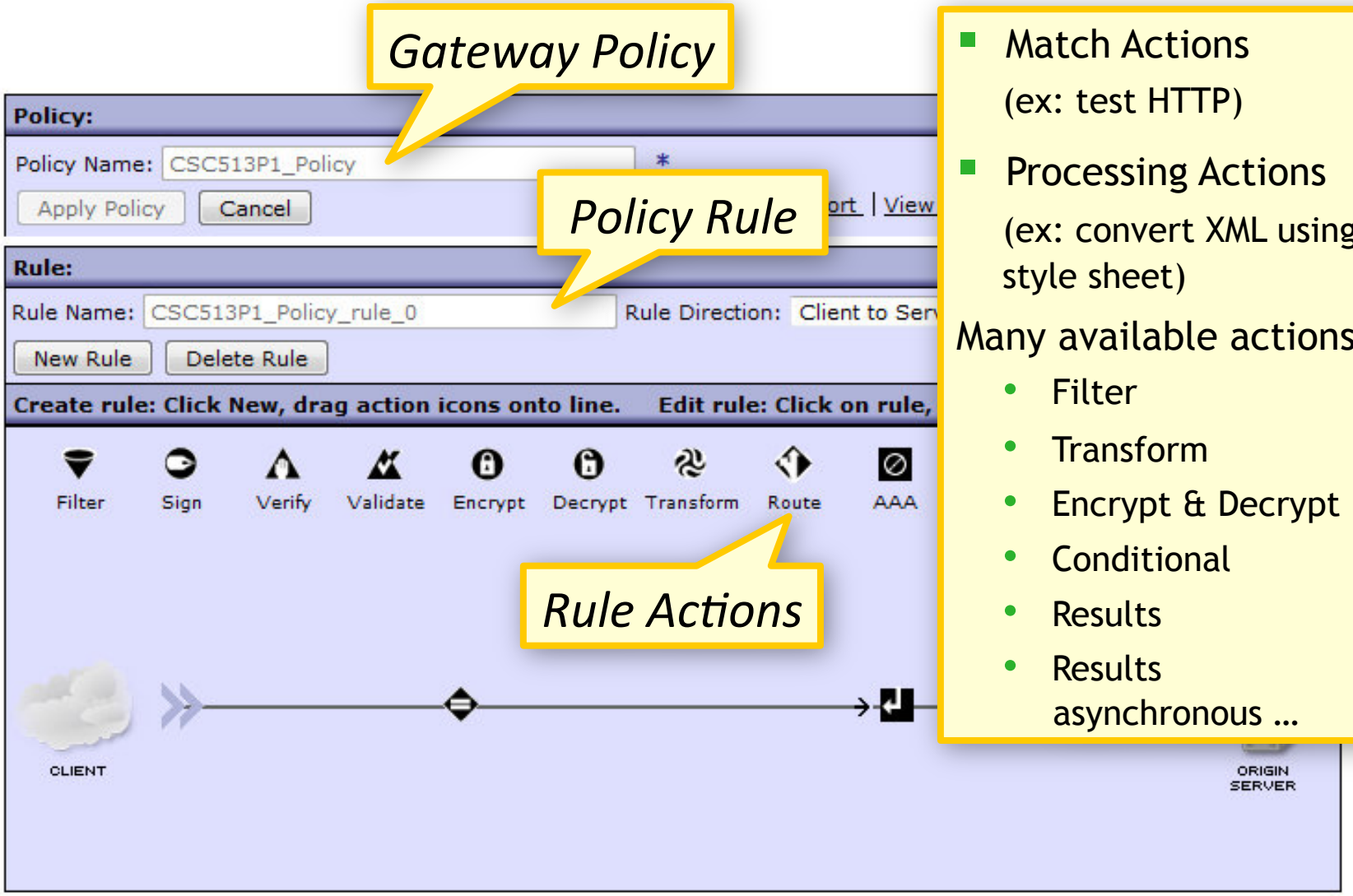
IBM DataPower SOA Appliances

- **XML Firewall** – Security for XML messages
- **Web Service Proxy** – Web service interface used to extend internally hosted services: security, abstraction
- **Multi-Protocol Gateway** – Interface to extend internally hosted services: protocol conversion, transformation, validation, security, abstraction

- **Gateway Policy** – Set of rules for processing messages
- **Policy Rules** – Set of actions to be performed for a specific condition: message arrival, message departure, error conditions
- **Rule Actions** – Process to be performed

Multi-Protocol Gateway Policy



- Match Actions
  (ex: test HTTP)
- Processing Actions
  (ex: convert XML using style sheet)

Many available actions

- Filter
- Transform
- Encrypt & Decrypt
- Conditional
- Results
- Results asynchronous …

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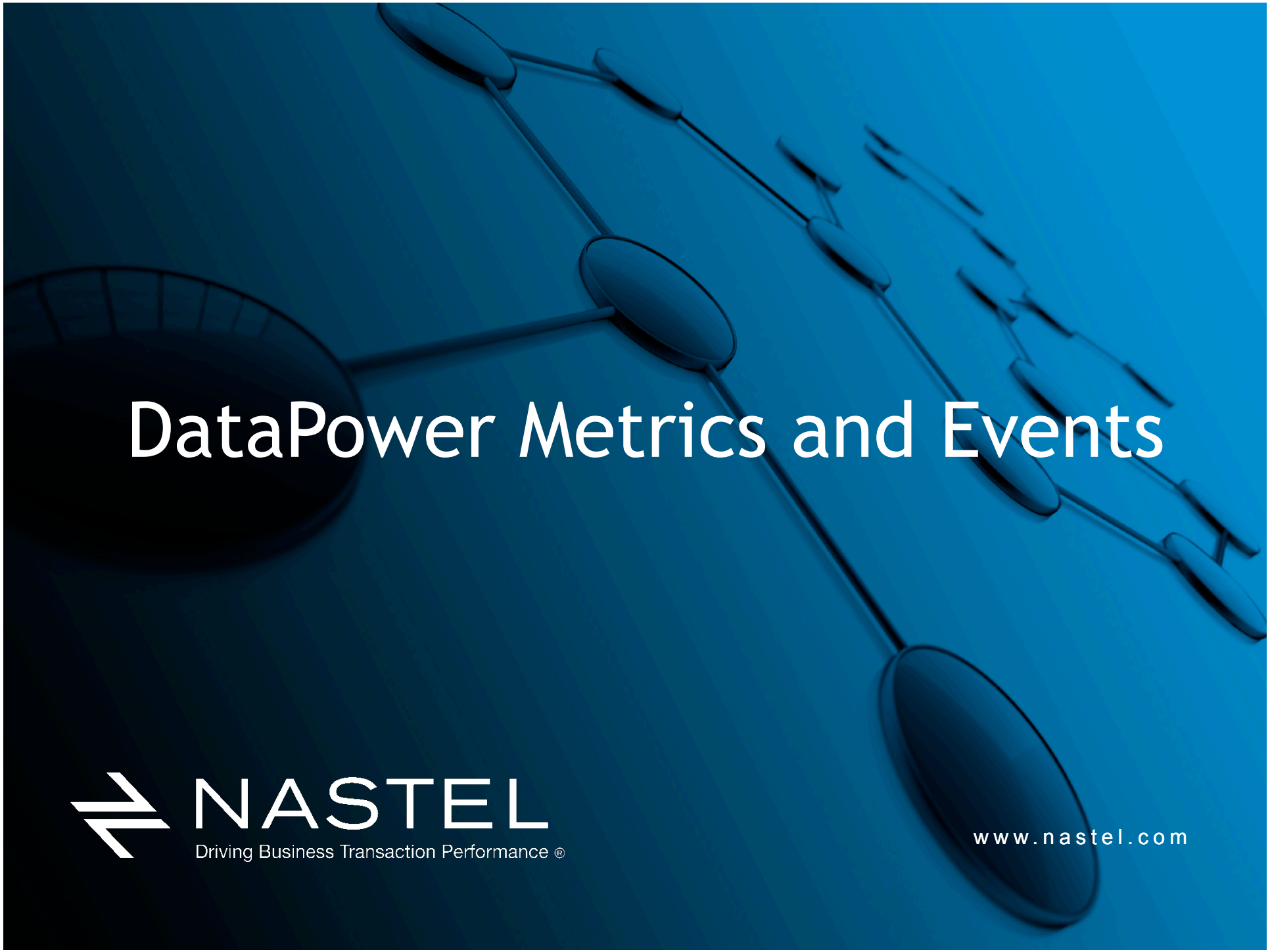
DataPower Metrics and Events
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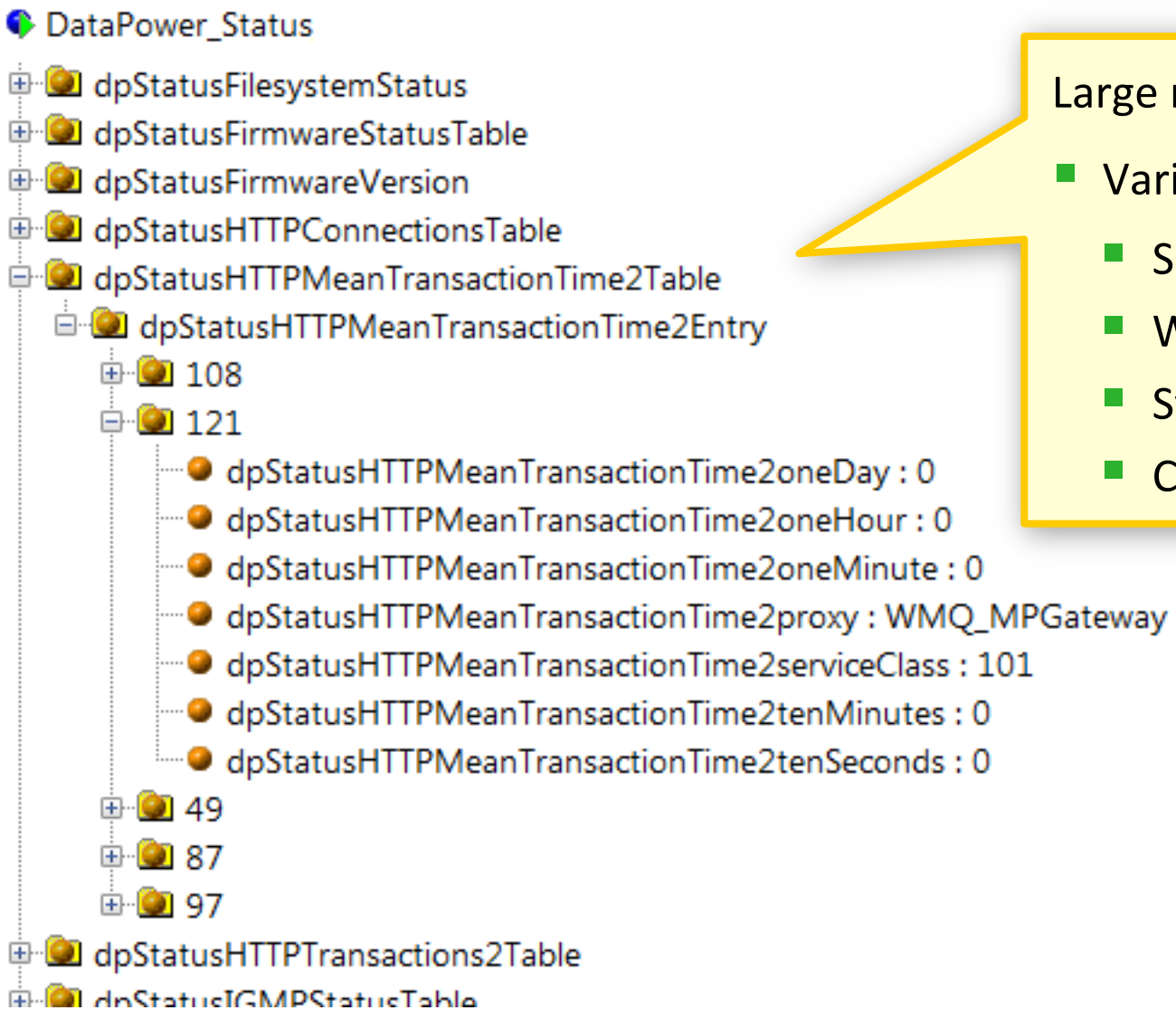
DataPower Metrics



Large range of metrics*

- Various interfaces:
  - SNMP
  - Web Services
  - Syslog
  - Command Line

(* Shown here : DataPower metrics collected by Nastel AutoPilot® M6)

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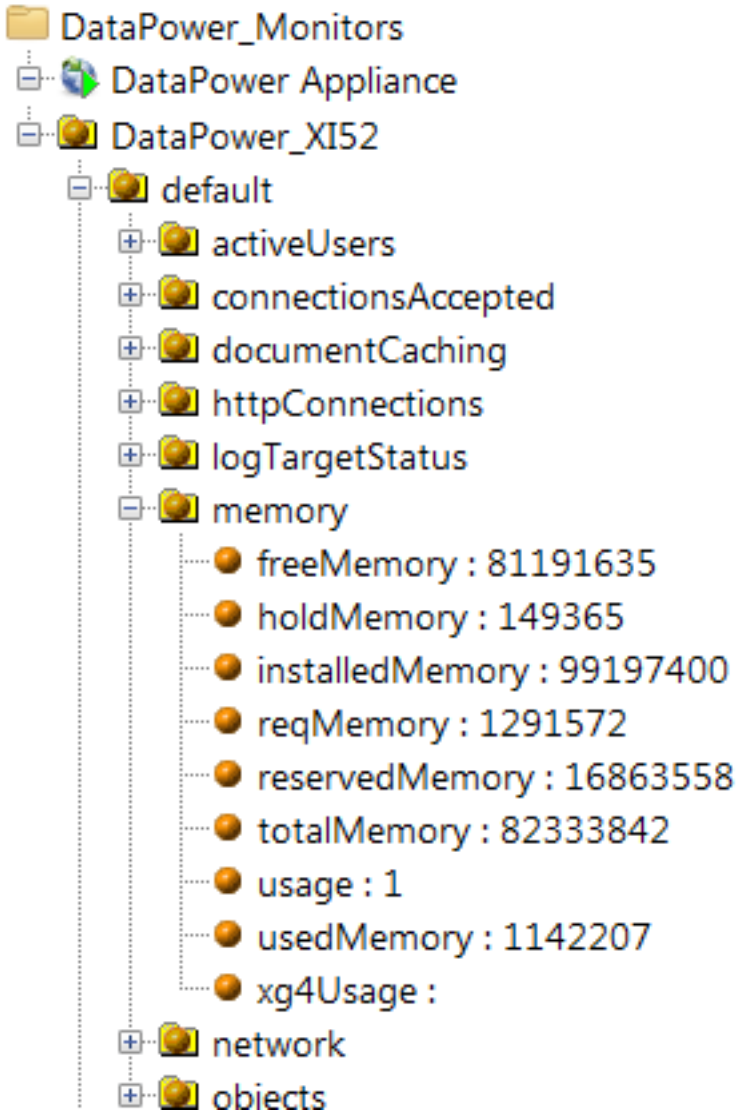
DataPower Metrics : Web Services Interface



Large range of metrics*

- Various interfaces:
  - SNMP
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(* Shown here : DataPower metrics collected by Nastel AutoPilot® M6)

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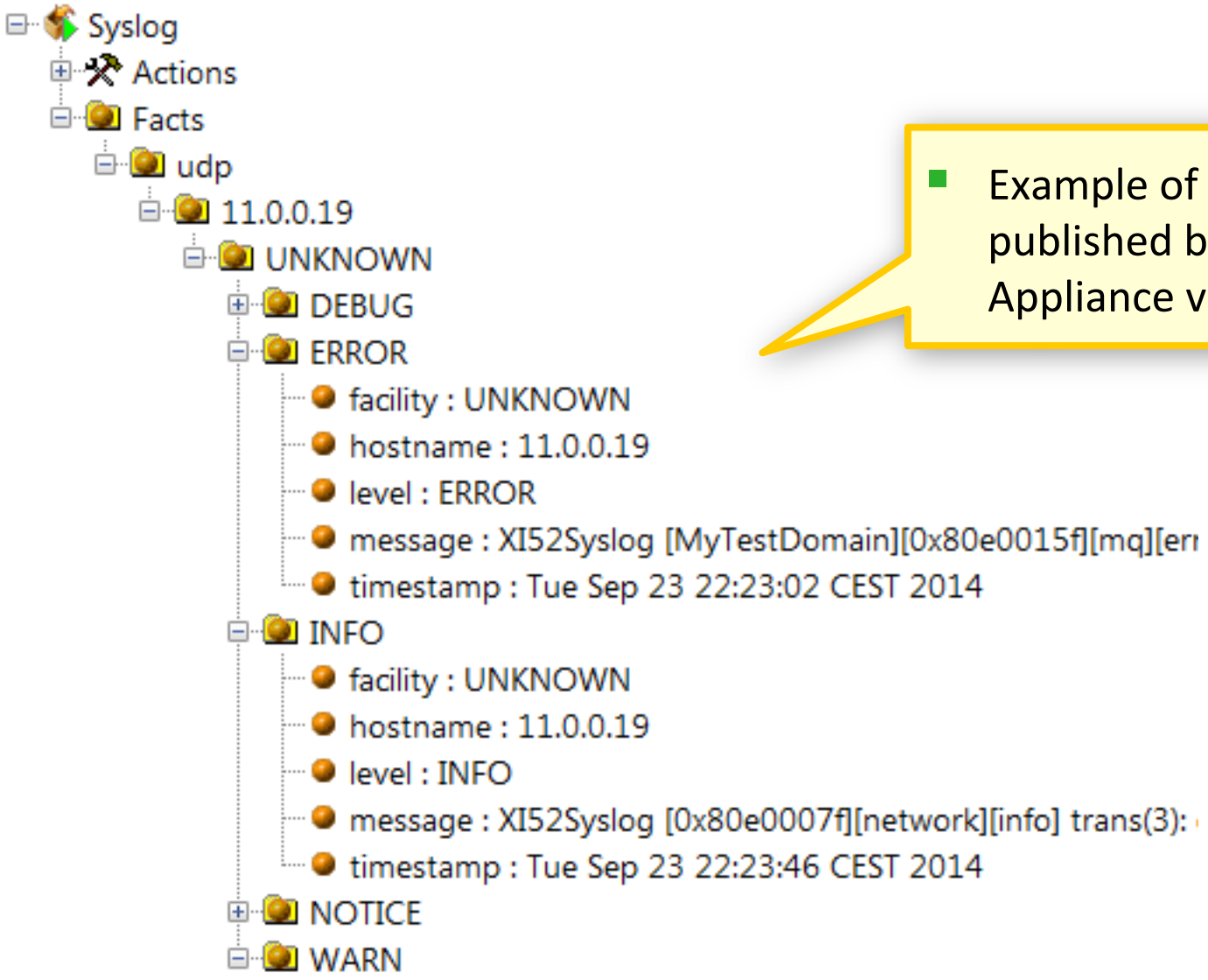
DataPower Notifications (Syslog, SNMP)



- Example of Log Events published by DataPower Appliance via Syslog

(* Shown here : DataPower metrics collected by Nastel AutoPilot® M6)

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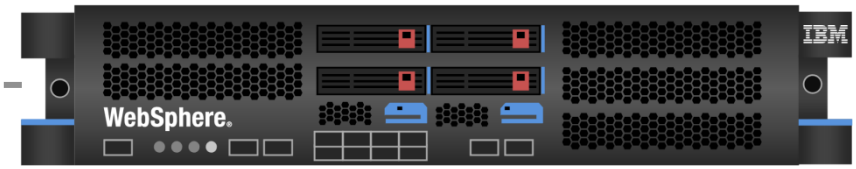
How to monitor DataPower SOA Appliances

Several management API's and interfaces available on DataPower SOA Appliances that provide detailed information about system health, operations and performance …

- Web Services
  - WSDM
  - WS-Management
- SNMP
  - Configuration
  - Statistics
- Syslog
  - Logs
- Command Line
  - Secure Shell



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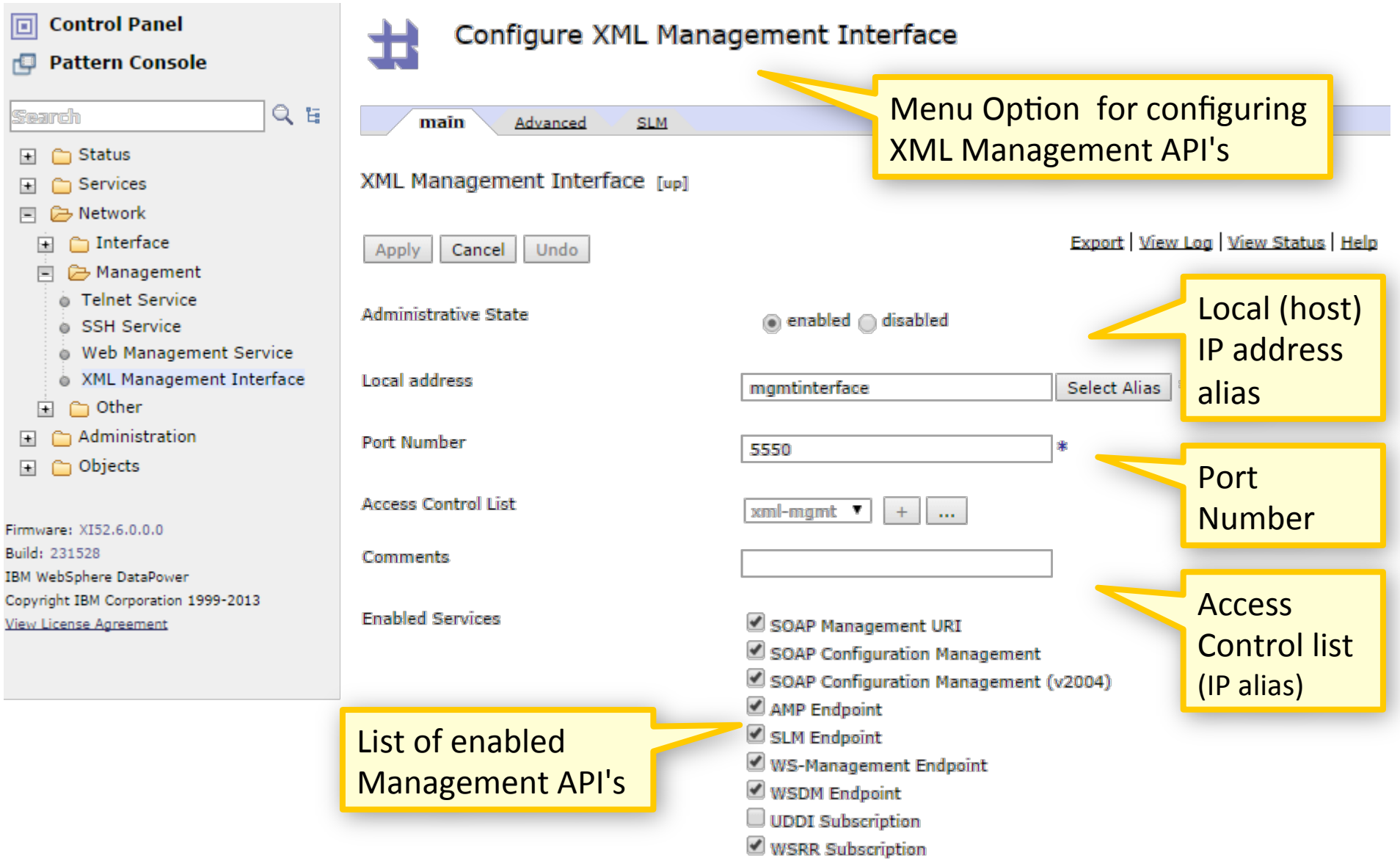
Configuring Web Services (XML) Interfaces



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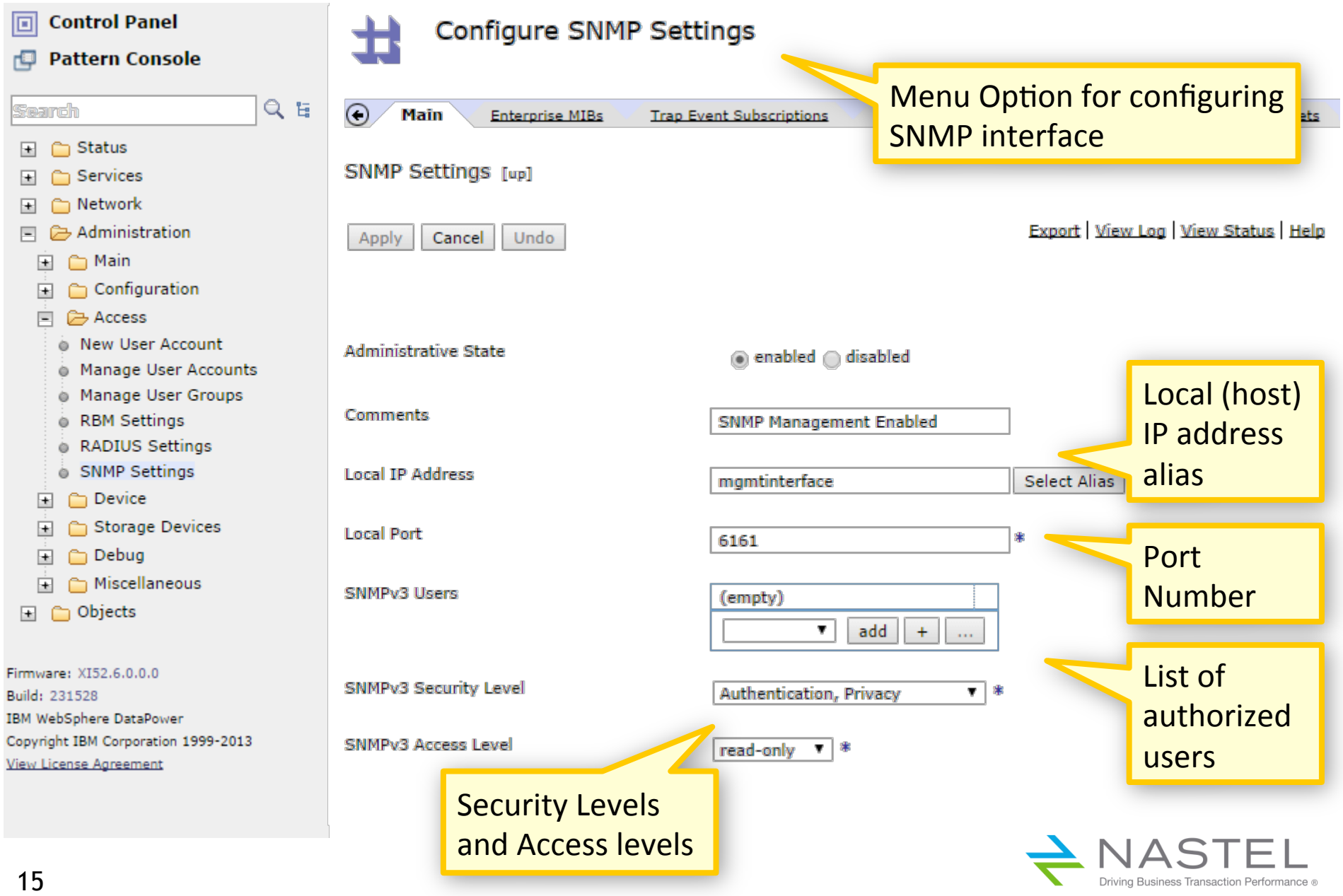
Configuring SNMP Interface



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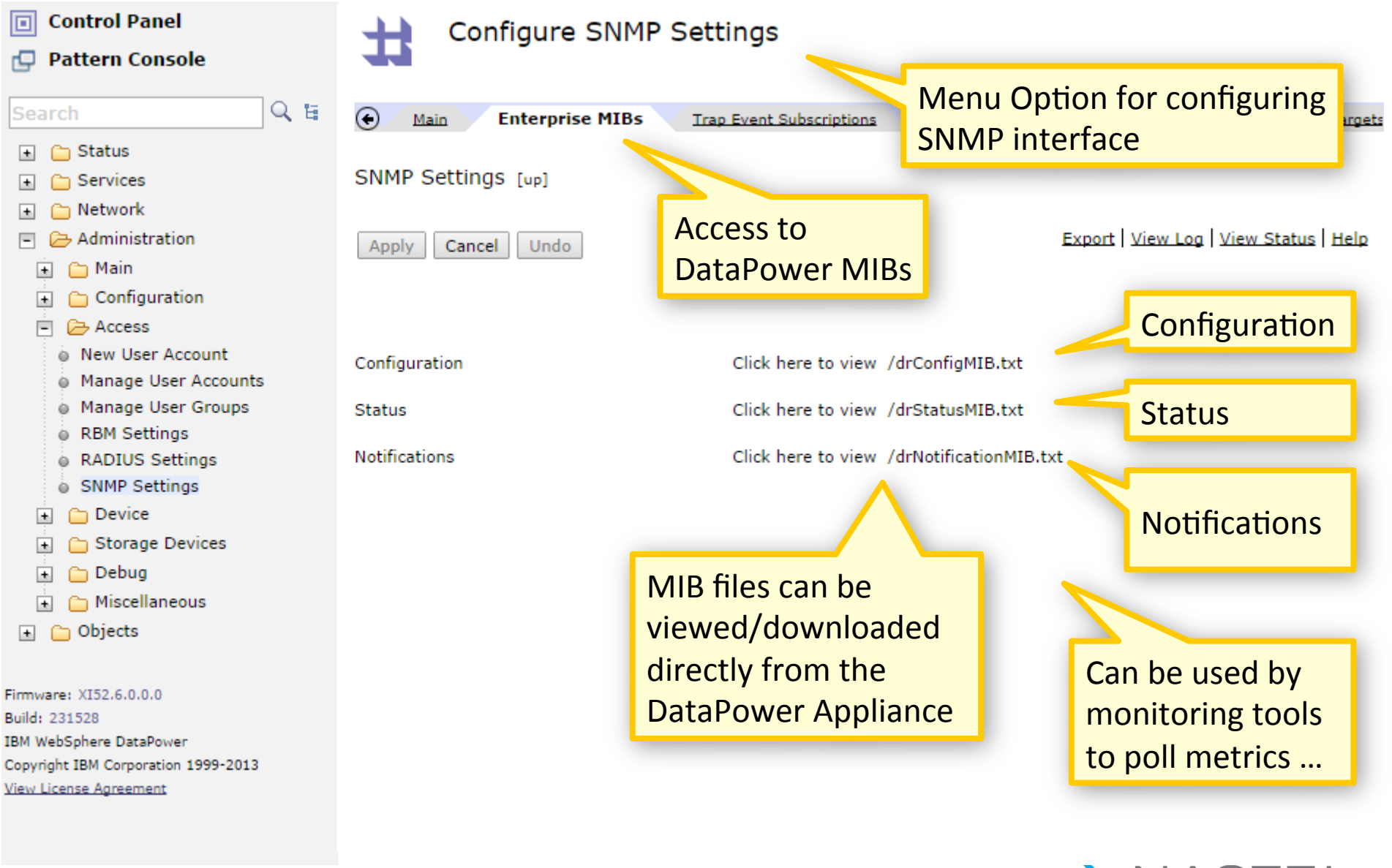
Configuring SNMP Interface - MIB Access



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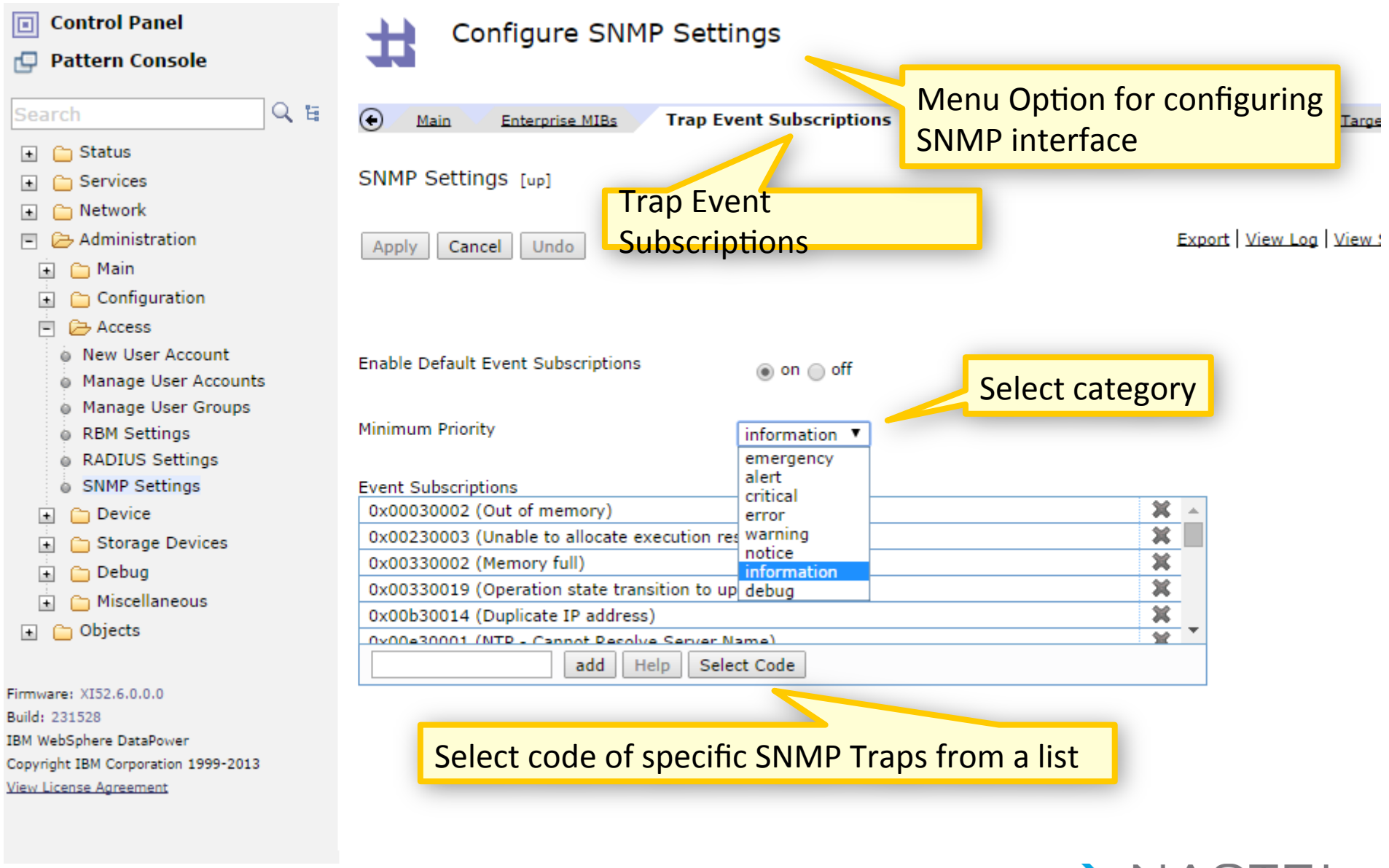
Configuring SNMP Interface - SNMP Traps



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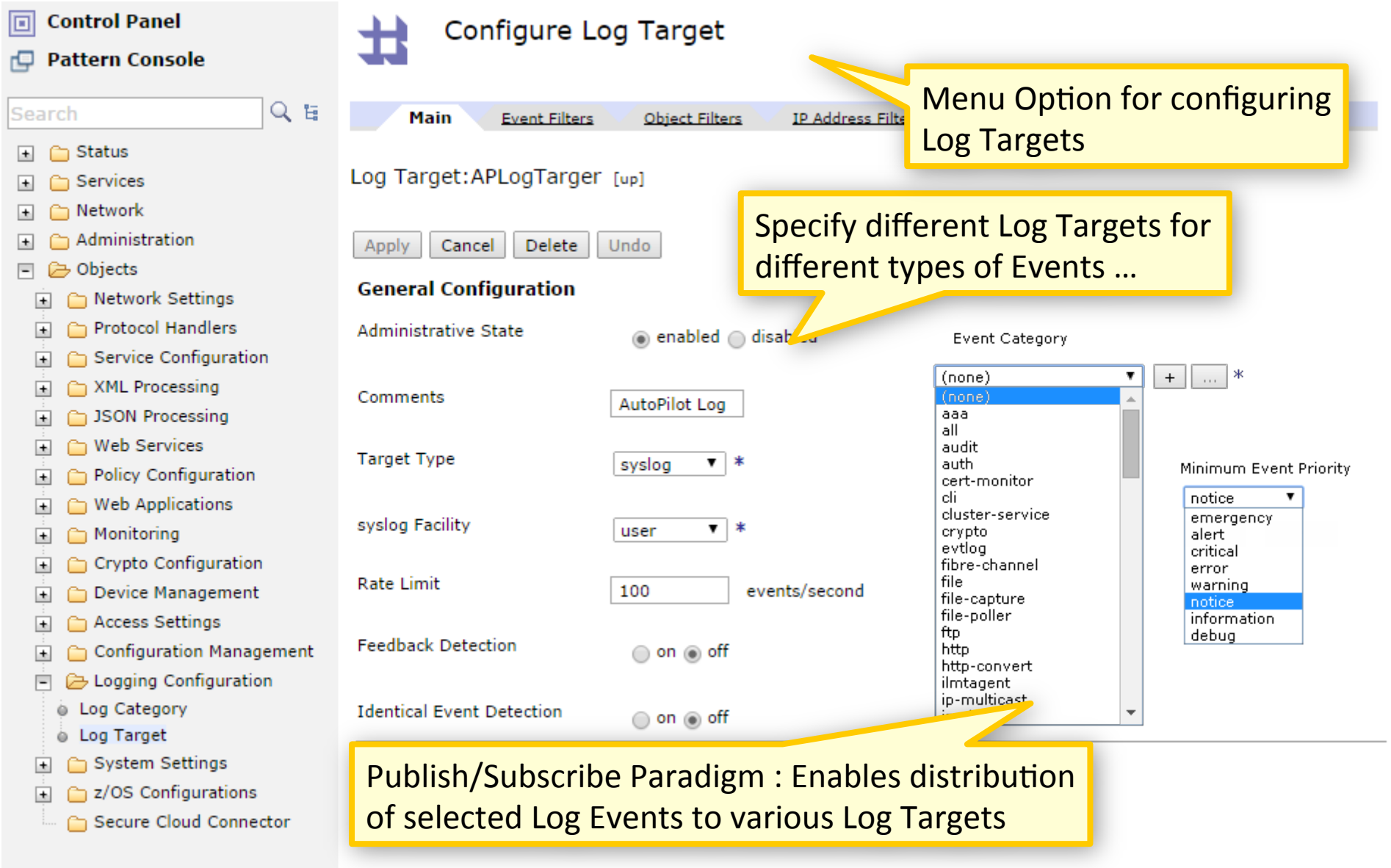
Configuring Syslog Interfaces



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Command Line Interface to DataPower

```
xi52# show statistics

                system uptime: 69 days 14:36:58
              open connections: 38
                  memory usage: 1089096 kB / 82333842 kB (1%)

                                  10 sec    1 min   10 min   1 hour    1 day
          connections accepted:        0        2       20     2397
                 cpu usage (%):        0        0        1        1

           stylesheet executions:
store:///dp/policyDomainStatus.xsl:
                                        9        1        0        2       18      116      170
             local:///simple.xsl:      12        1        0        0
          local:///tworks_wp.xsl:      13        1        0        0

 stylesheet mean execution times:
store:///dp/policyDomainStatus.xsl:
                                        9        1        0       23       92       89       81
             local:///simple.xsl:      12        1        0        0        0        0        0
          local:///tworks_wp.xsl:      13        1        0        0        0        0        0
```

Running Command Line requests

Get information; Take actions …

… Run a scripted dialogue


Message Flow Tracking
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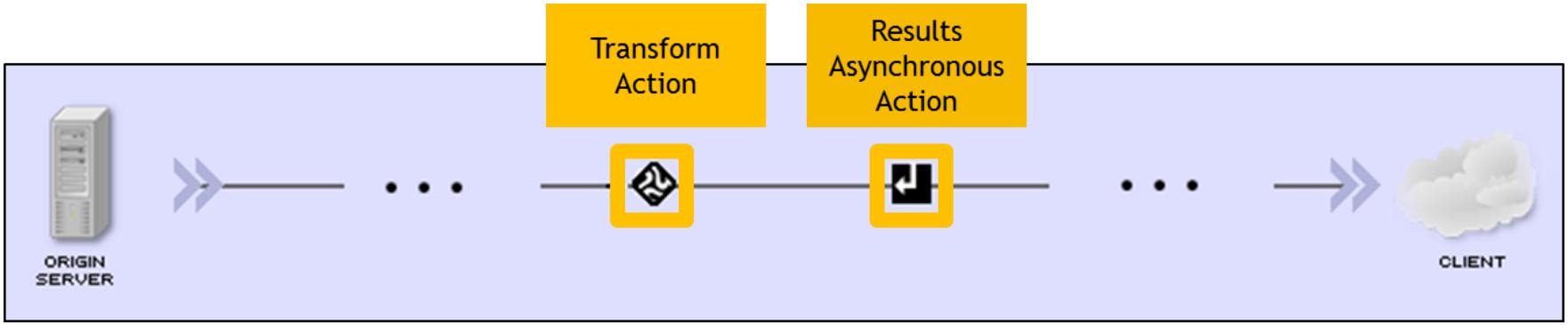
Instrumenting DataPower Transactions

- Transform Action : transforms input messages into a normalized form – a "tracking event" with pertinent information about the transaction flow using DataPower variables and functions. The tracking event also includes the message data.
- Results Asynchronous Action : sends the tracking event as a message to a WebSphere MQ queue – asynchronously - where it is subsequently read by a Processing Point.



- Advantage: DataPower transaction processing continues without performance impact while AutoPilot® M6 takes care of transaction monitoring.

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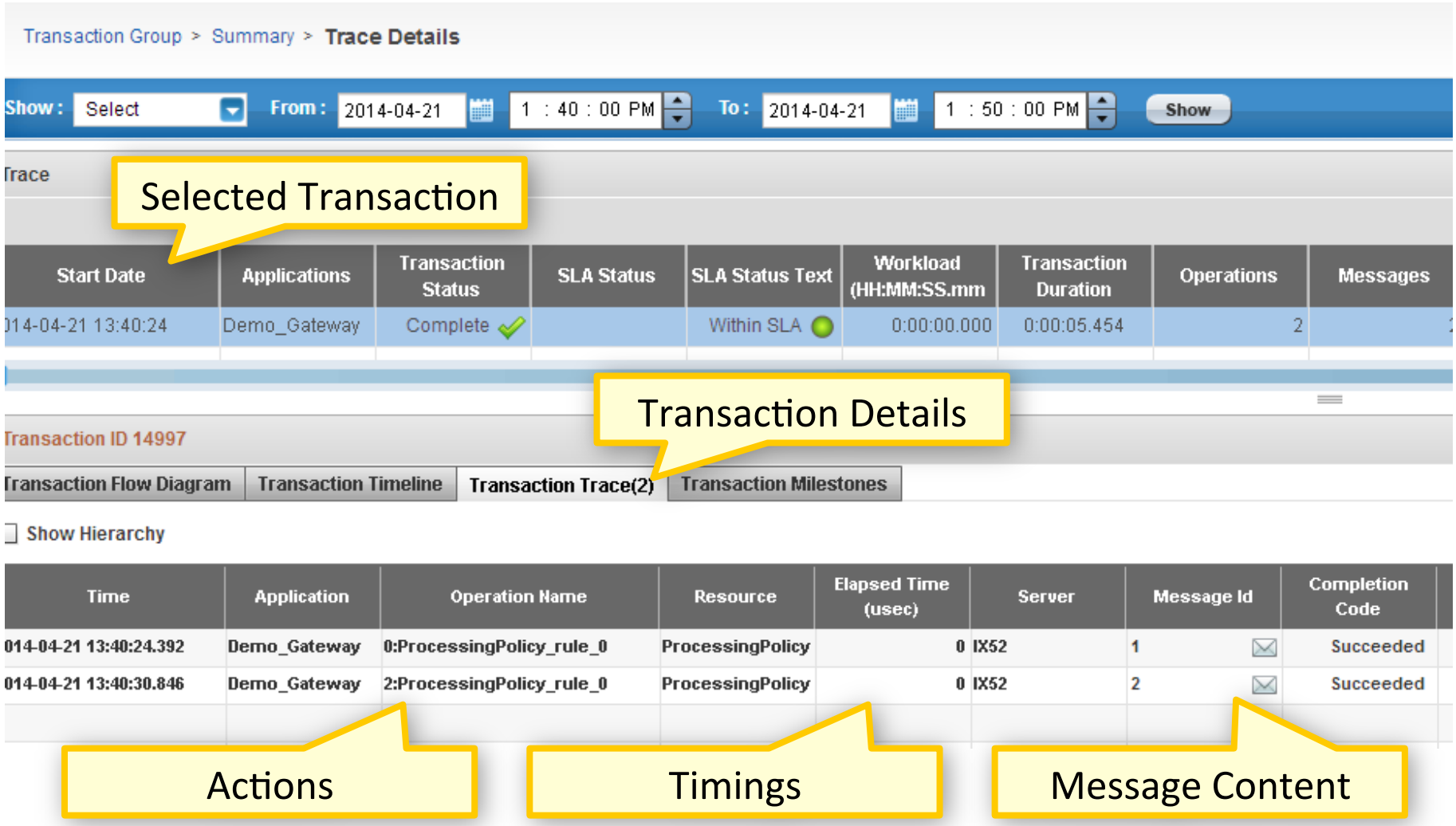
Example: Transaction Trace Details



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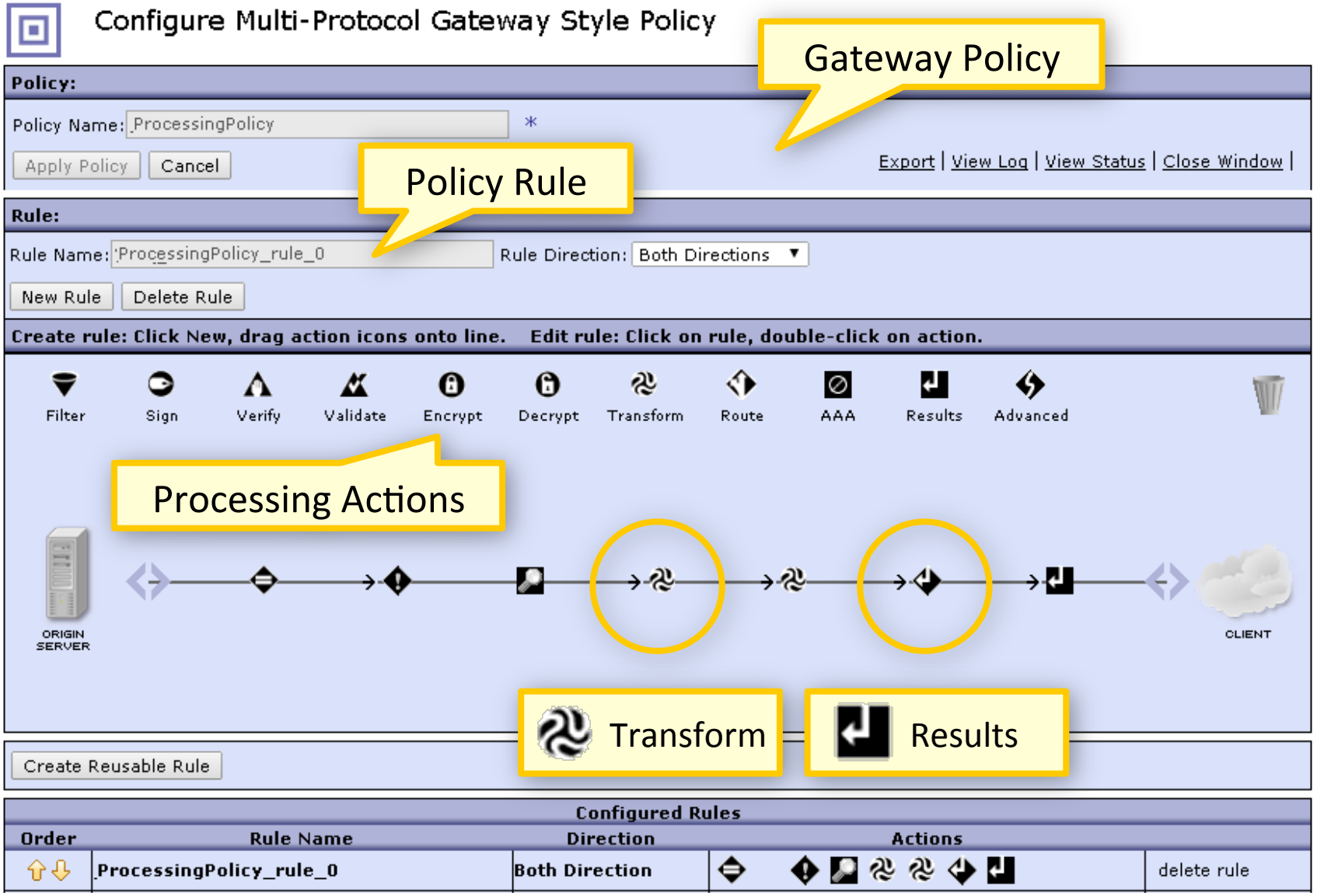
Configuring Message Flow Events



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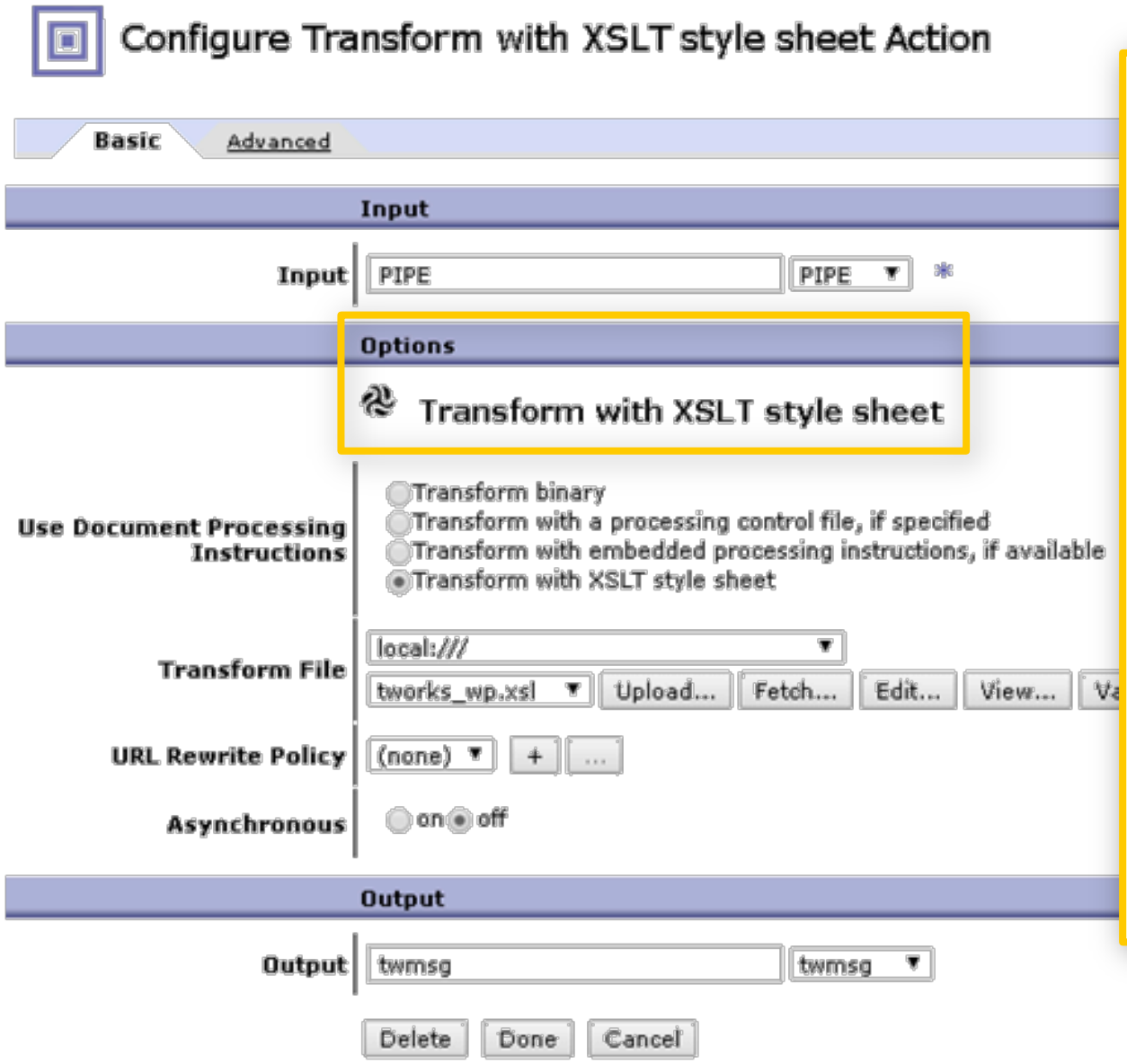
Creating the Tracking Event



- Transform Action creates a Tracking Event
- Analogous to the barcode sticker on a shipped package
- Transform action uses an XSLT style sheet
- Can include all or part of the input message data
- Tracking event is input to Results Async. Action

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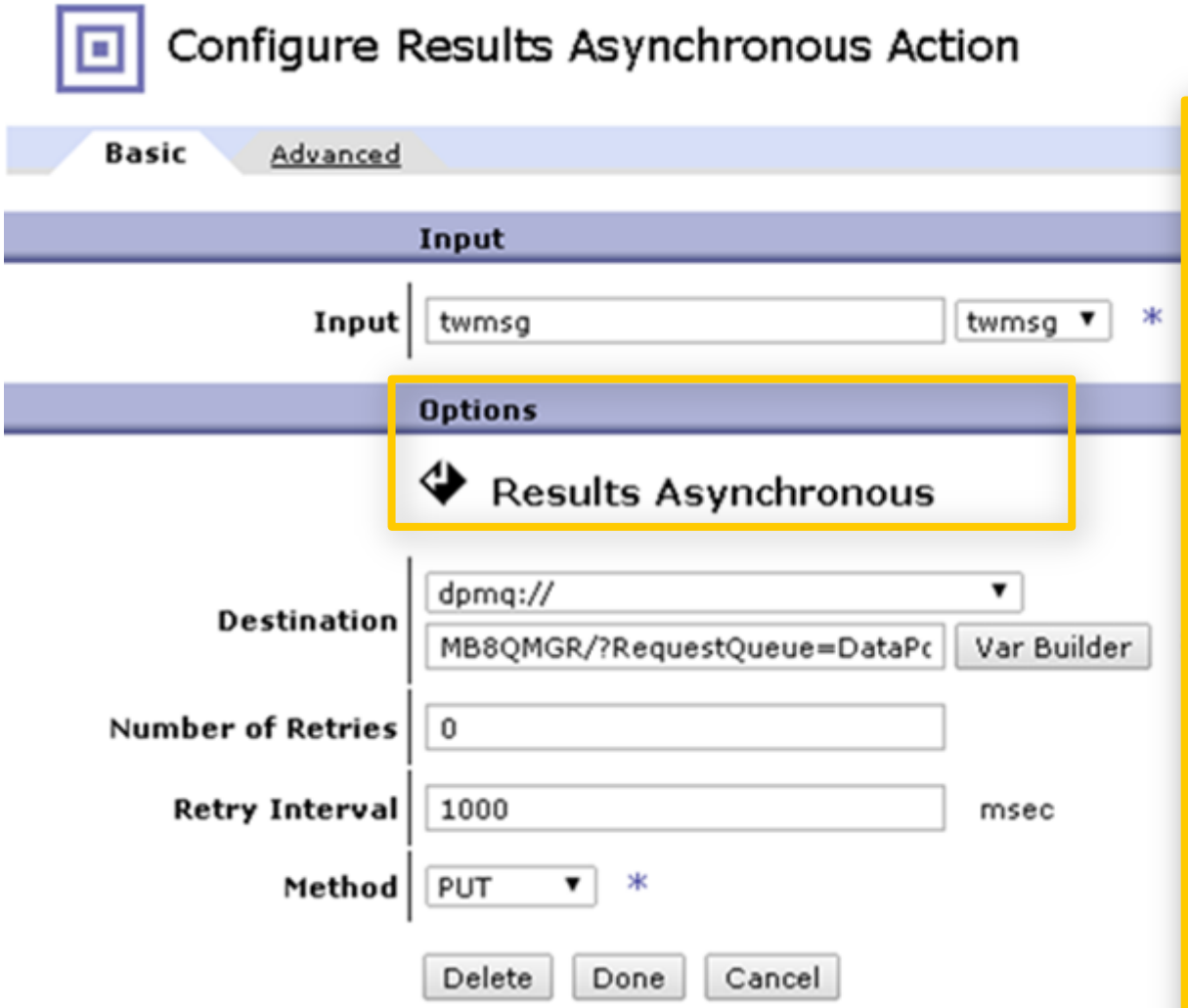
Constructing the Tracking Event

```
<?xml version="1.0" encoding="UTF-8"?>
<xsl:stylesheet version="1.0"
                xmlns:xsl="http://www.w3.org/1999/XSL/Transfor
                xmlns:dp="http://www.datapower.com/extensions"
                xmlns:dpconfig="http://www.datapower.com/param
                extension-element-prefixes="dp"
                exclude-result-prefixes="dp dpconfig">
  <xsl:output method="xml"/>
  <xsl:template match="/">
    <tracking_event xmlns:xsi="http://www.w3.org/2001/XMLSchem
                    xsi:noNamespaceSchemaLocation="wp.xsd">
      <HostName>ix52</HostName>
      <HostInfo>
        <xsl:value-of select="dp:variable('var://service/syste
      </HostInfo>
      <Service>
        <xsl:value-of select="dp:variable('var://service/proce
      </Service>
      <Domain>
        <xsl:value-of select="dp:variable('var://service/domai
      </Domain>
      <Correlator>
            <xsl:value-of select="."/>
      </Correlator>
      <Policy>
        <xsl:value-of select="dp:variable('var://service/transaction-policy-name')" />
      </Policy>
      <Rule>
        <xsl:value-of select="dp:variable('var://service/transaction-rule-name')" />
```

- XSLT stylesheet
- Provided as a template
- All available information can be included:
  - Processing rules
  - Correlators
  - Message text
  - DataPower variables
  - Other variables
- Can be reused in other MPG Policies

Sending the Tracking Event



- Results Asynchronous Action
  - Sends results and does not wait for a response
- Uses Tracking Event message as input
- Output message is PUT to a WebSphere MQ Queue
- External Processing Point extracts transaction data from the MQ message


Leveraging the Information
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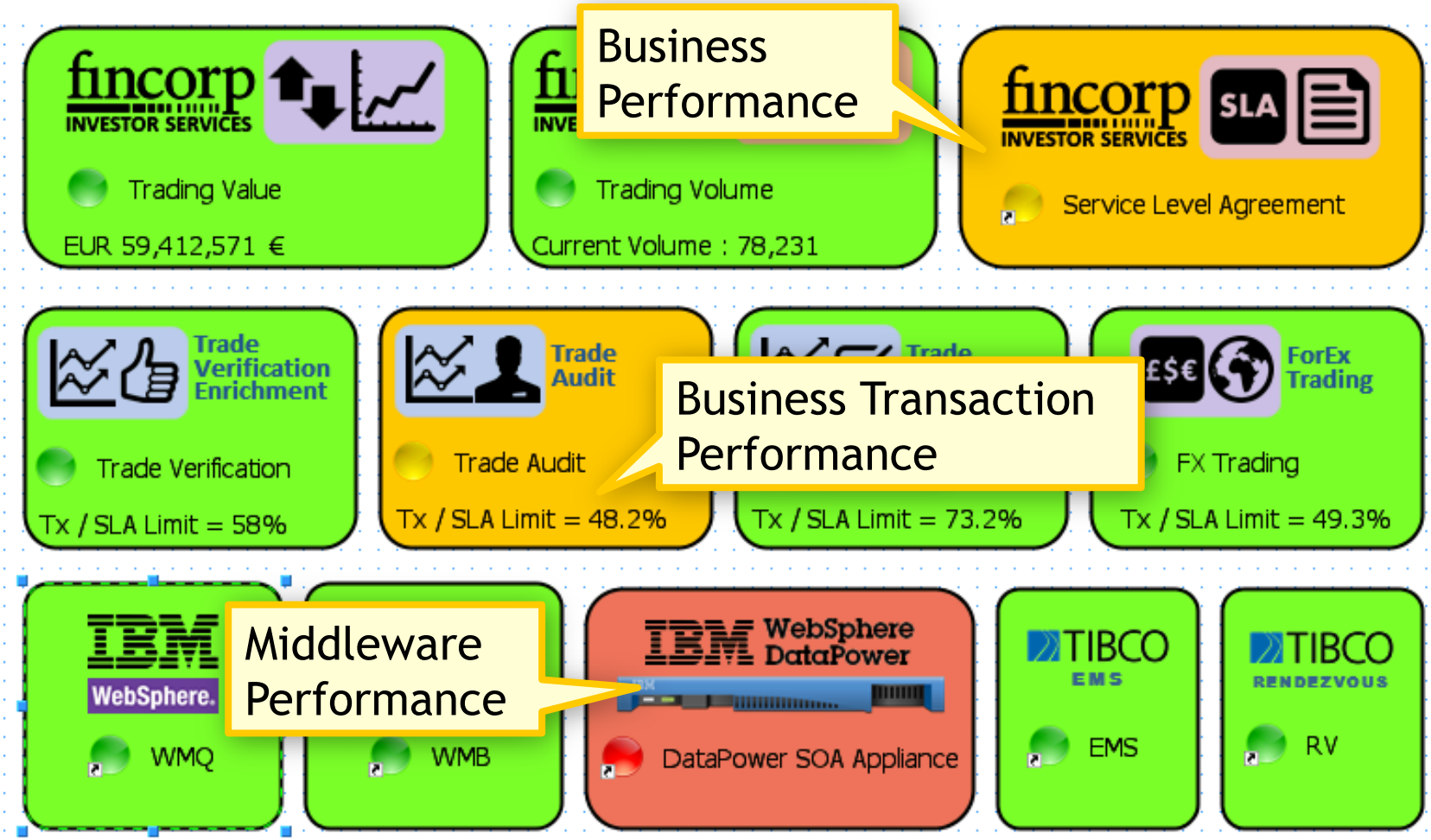
DataPower Status (Situational Awareness)



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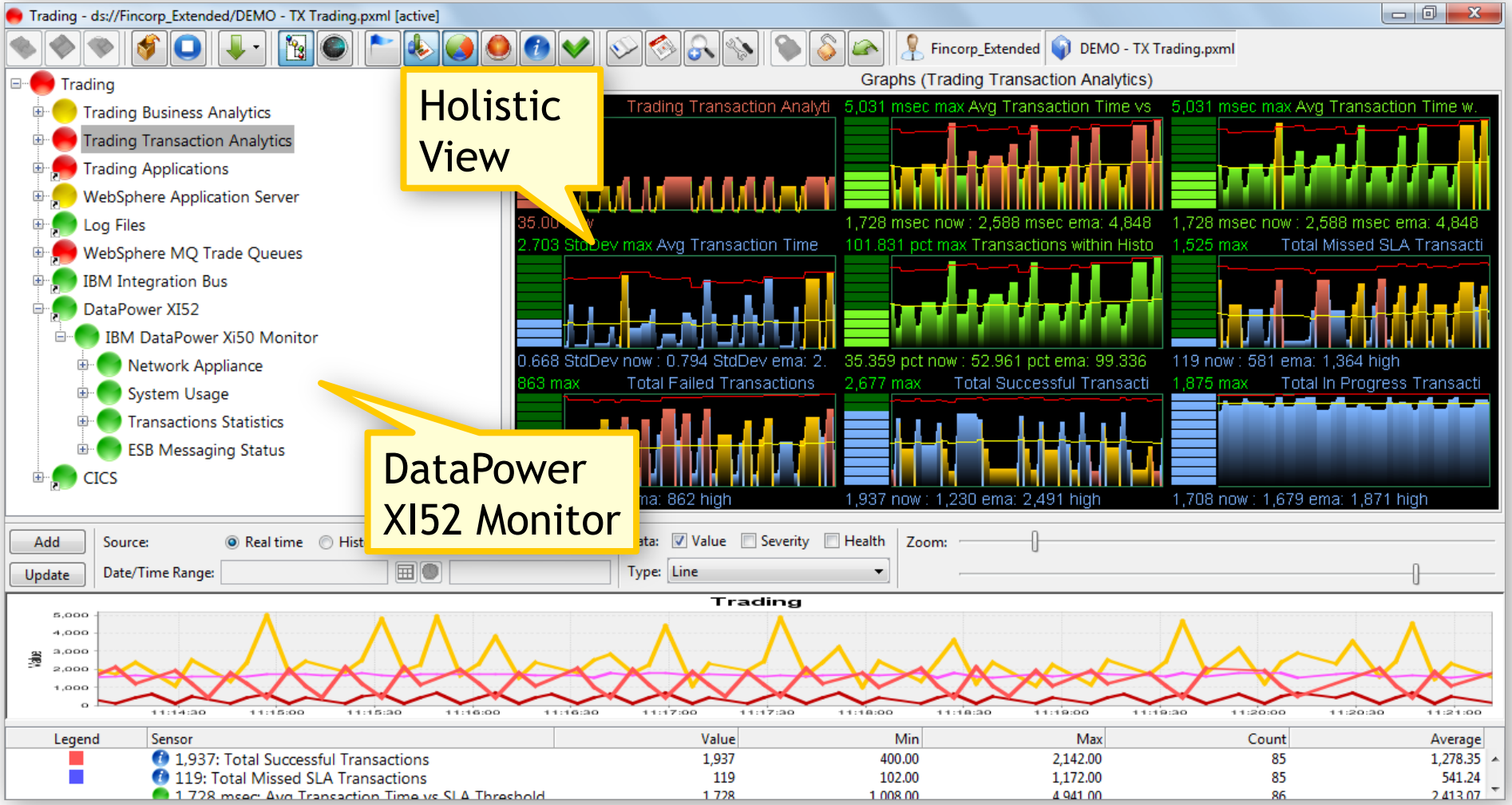
DataPower System Health



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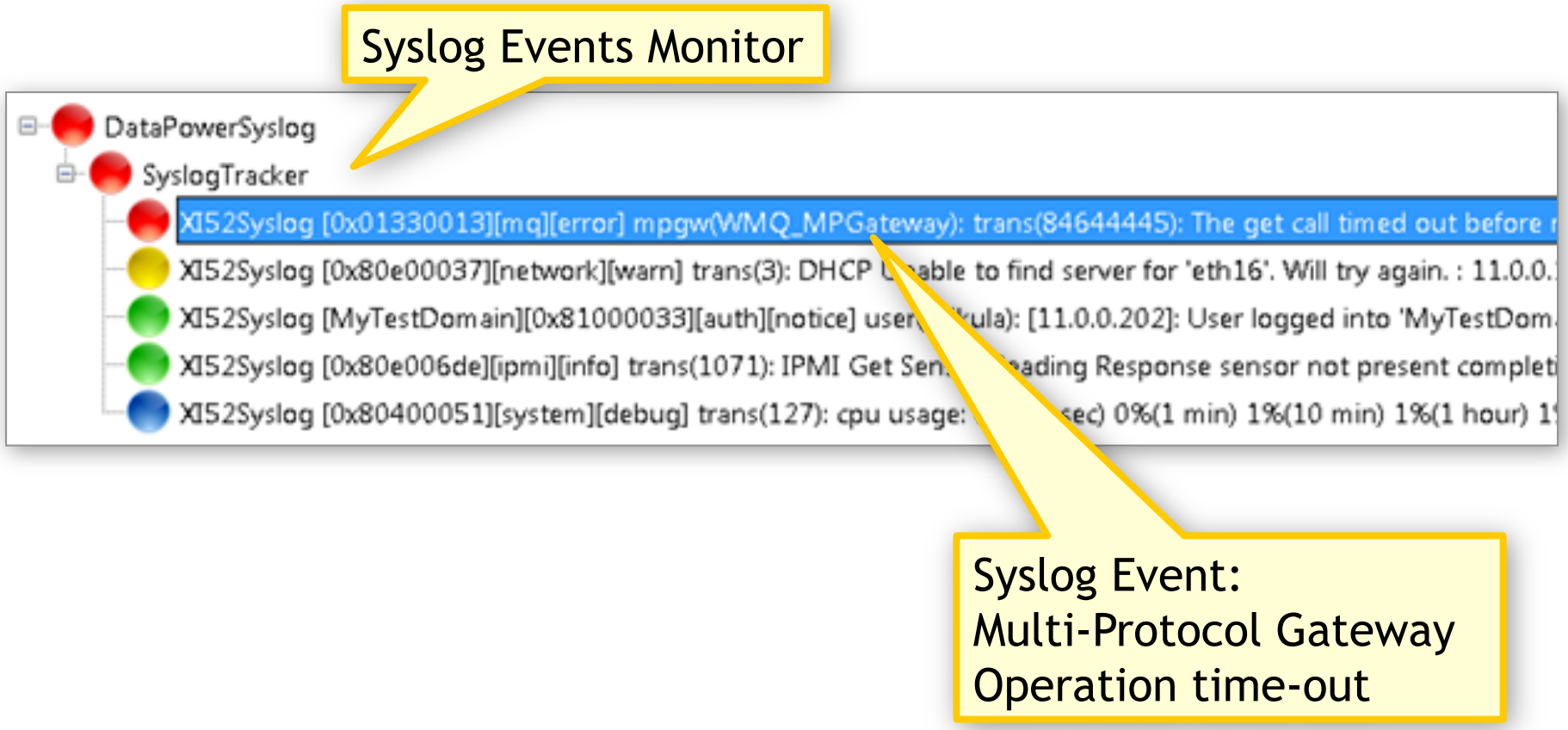
Message Failures are Occurring



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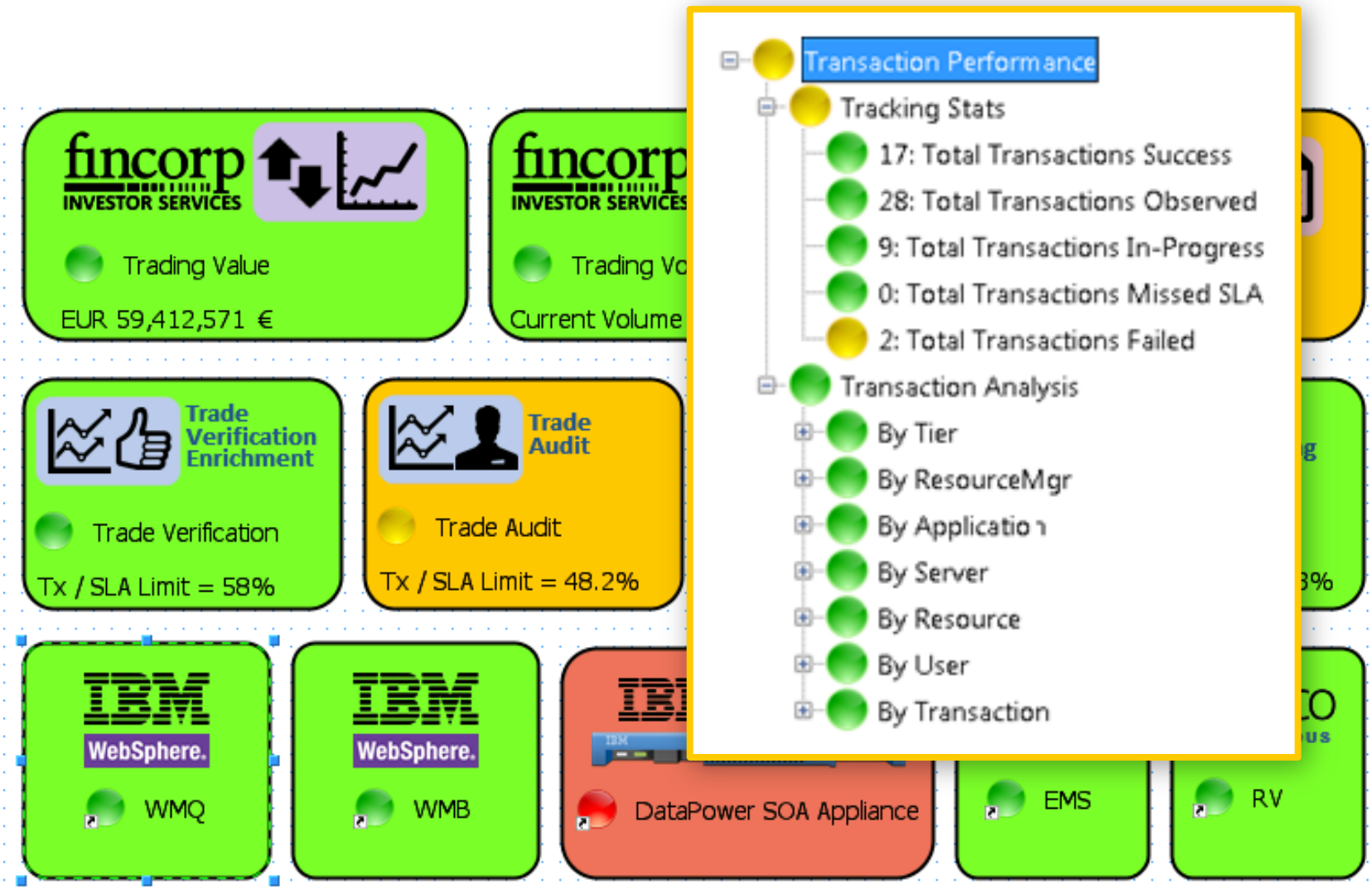
DataPower Status in Context (Situational Awareness)



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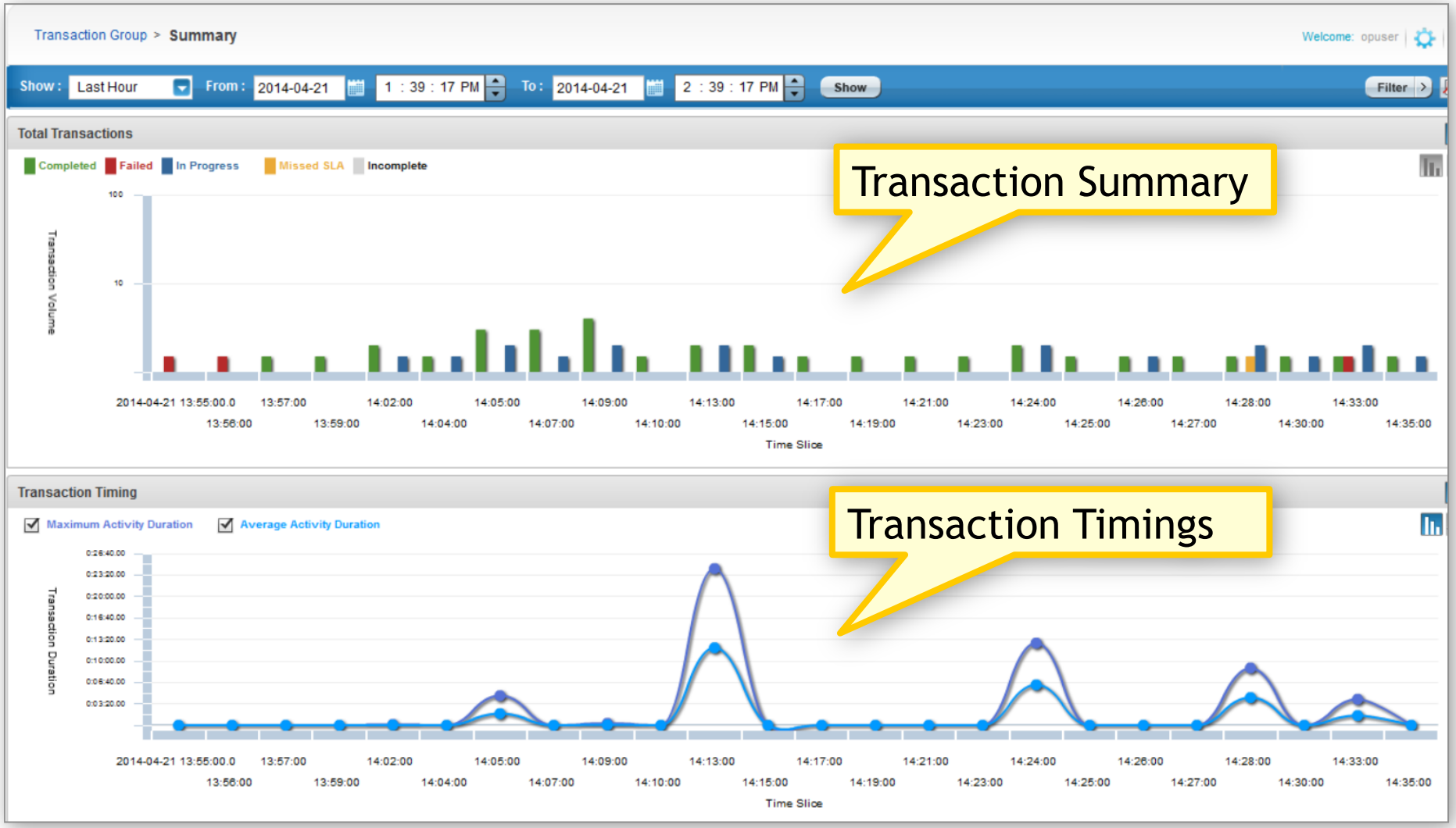
Transaction Summary



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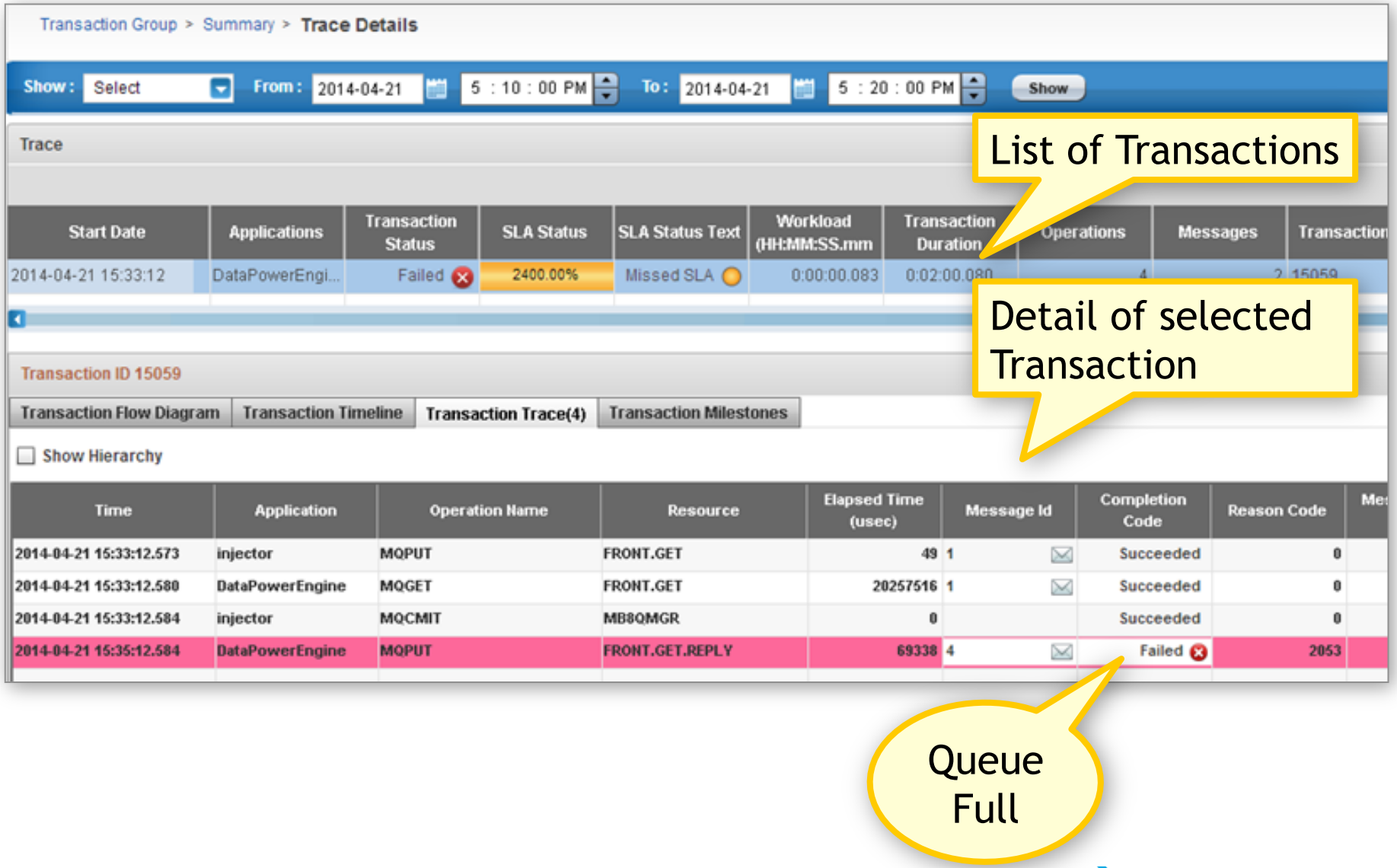
Failure Code



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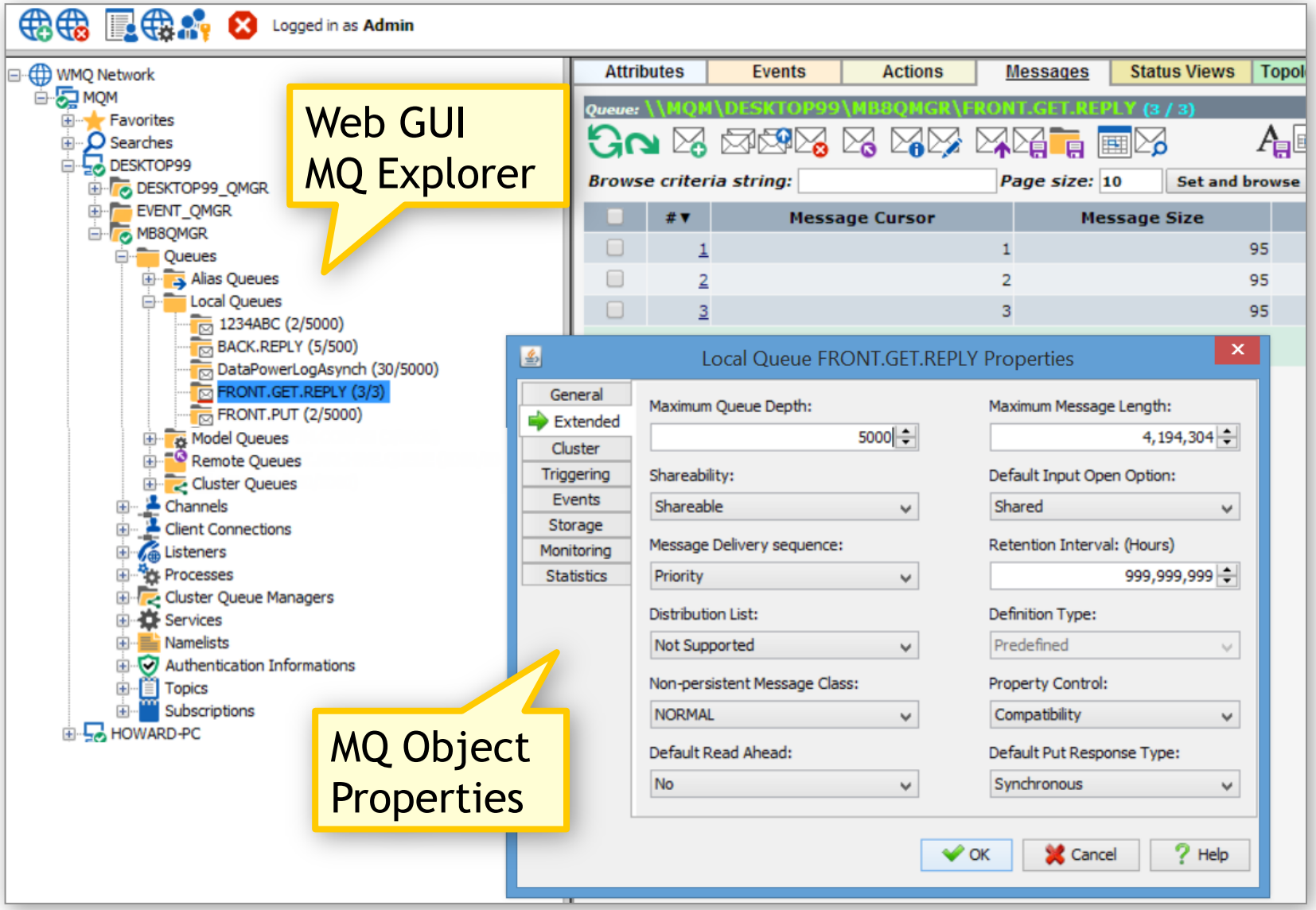
Correcting the Queue Definition



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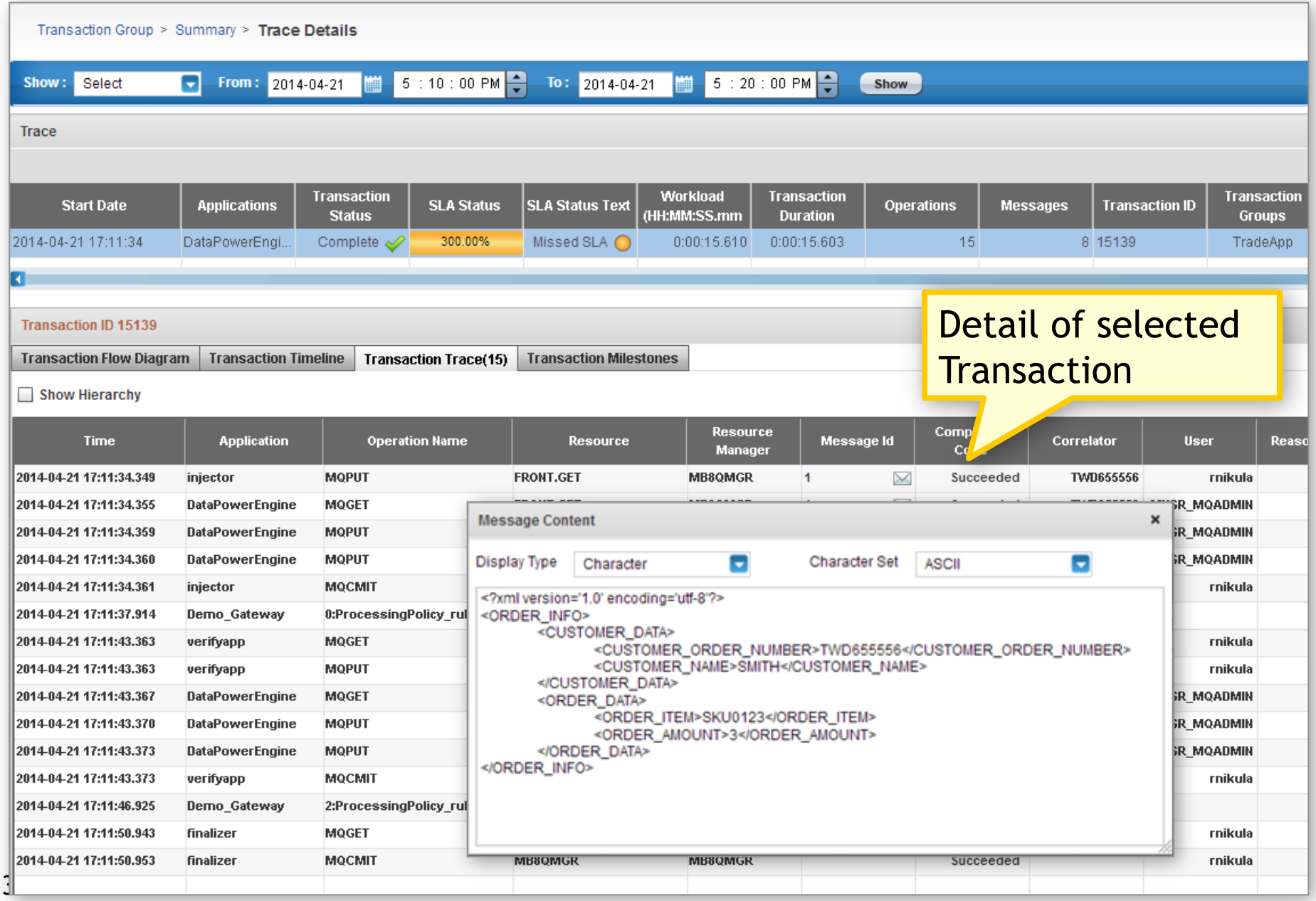
Ability to See the Combined Flow




Closing
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