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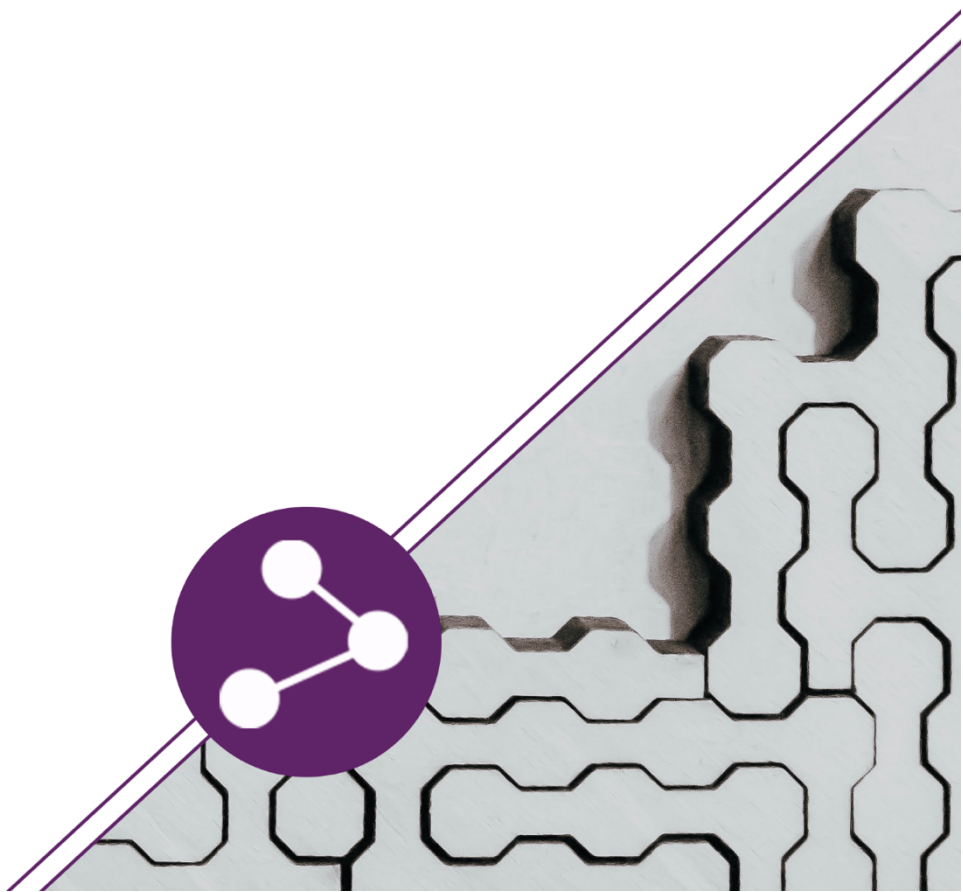
Responsiv Unity Client-Side Bridge Node

RA00CA4-PD

Product Description



Responsiv Unity Client-Side Bridge

This product is used by Responsiv Cloud Open Finance Gateway to manage secure connections between the internal systems and a Responsiv Cloud Platform. It can be configured to perform integration between standardised API calls made by a cloud platform, and one or more internal systems.

The advantages of having a Client-Side Bridge include (1) Protocols can be changed from those used internally (REST, Webservice, RPC, etc) to MQ or compressed formats to pass across the Internet or into the Responsiv Cloud, (2) the bridge is a single point of control for all ingress and egress of data, the indirection allows for internal systems to change their network locations, and be replaced or upgraded, without changes to the Cloud service or platform.

This product description describes the key features, functions, and capabilities of the product or service. It is not intended to fully document the product or to provide support.

Audience

This description is for architects and technical specialists to give a high-level, brief description of the product or service. It is intended to be used to inform users of the broad functions and scope of capability. Refer to linked product documentation for details. Responsiv reserve the right to change the specification at any time and without notice.

Obligations

This document is not an offer or contract. Neither Responsiv nor you have any obligations or liability to the other unless our authorised representatives enter into a separate definitive written agreement. Terms included in this document are not binding unless they are included in such a written agreement.

Observations and recommendations in this document are based on our opinions, experience, and knowledge of the product. Responsiv makes no representation as to accuracy or fitness for purpose.

Underlying Software

This description is for a Responsiv product that is implemented using a combination of capabilities delivered by pre-existing products. References to those products and their documentation are required to improve understanding of the capabilities that are available and how to access them using the available tooling. Responsiv makes no claim that our product provides all documented features. If a feature is of particular interest, please seek clarification with Responsiv.

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https://www.apache.org/licenses/LICENSE-2.0

https://opensource.org/license/mit/

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Service Overview

This product is used by Responsiv Cloud Open Finance Gateway to manage secure connections between the internal systems and a Responsiv Cloud Platform. It can be configured to perform integration between standardised API calls made by a cloud platform, and one or more internal systems.

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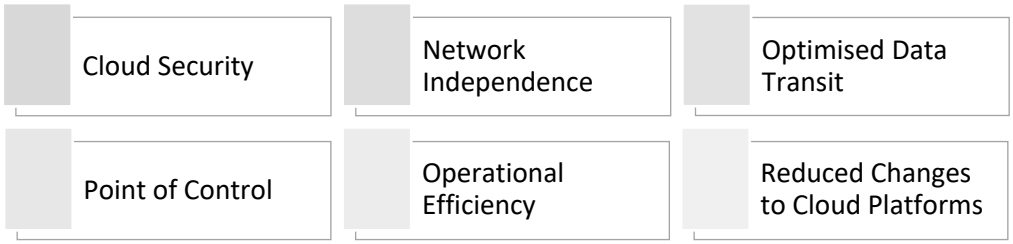
The Responsiv Cloud Open Finance Gateway uses the Responsiv Unity Client-Side Bridge to secure payment requests and allow the bank to control upgrades and movements of internal systems without impacting the Open Finance Service. In this case, the Client-Side Bridge (CSB) requires configuration to integrate with the Security, Email, DNS, Core Banking System, and Payment infrastructure.

This product checks for duplicate payment requests and security features of the request received. It does not perform AML, Denied Parties, KYC, or any other regulatory requirements associated with payment processing.

Responsiv Open Finance products do not process payments, they pass requests for payments to payment systems.

The product provides six key features.



Cloud Security

The bridge is configured to have a protected connection between itself and the Responsiv Cloud Open Finance Gateway.

The node supports standard API protective protocols, including OAuth2, OpenID, JWT. Advanced Message Security allows messages to be individually encrypted from end to end, including at rest in queues. Message passing channels use TLS encryption to protect traffic from end to end.

Responsiv Unity Client-Side Bridge Node can be used to expose data and functionality that is otherwise difficult to access. The APIs exposed in this way can be secured and deliver a consistent programming experience. The platform can be used as a dispatcher for change-data-capture events, allowing applications across the organisation to respond to changes in systems and databases.

Network Independence

Responsiv Unity Client-Side Bridge Node handles events from Internet of Things (IoT) devices, change-data-capture (CDC), and from other real-time notifications. Events can be combined with enterprise data processing to deliver significant benefits from information sharing and applying AI to seek patterns.

Optimised Data Transit

Integration patterns from publish subscribe, one to many, many to one, synchronous, asynchronous, request-response, fire and forget, and file transfer can all be integrated using the same technology and low-code configurations. It can prioritise messages and develop event systems alongside file-oriented solutions.

Built in functionality performs declarative parsing of inputs and outputs that can include RPC, Binary, Cobol, C, and varied code pages.

Point of Control

The bridge is used to connect systems, allowing them to share data directly and in real-time. It is also used to create and expose APIs to make data and functions more widely available using consistent security, consistent protocols, and standardised data model. The node supports real-time, offline, publish-subscribe, point to point, and event integration using a standardised set of controls and single technology.

Operational Efficiency

The Responsiv Unity Client-Side Bridge hosts APIs that allow the Responsiv Cloud Open Finance Gateway to monitor and request information about the bridge. These APIs are in addition to any APIs that may be required to implement API packs deployed to the gateway and do not allow management of the bridge.

Reduced Changes to Cloud Platforms

The bridge has an Enterprise Application Integration (EAI) environment that can be configured to integrate with banking and finance systems to push and pull data from the gateway to the system. Data changes can be detected and reflected to the cloud service using workflows that can detect changes to data inside applications and databases and reflect those changes across the enterprise. Information can be inspected, transformed, augmented, and validated between systems.

Service Limitations

This product is to create and manage bi-directional connections between internal systems and the Responsiv Cloud Open Finance Gateway or the Responsiv Cloud Open Banking Gateway. It cannot be used to connect one internal system to another.

Accessing the Service

The service is self-hosted in your chosen location, which can be a private datacentre, or any cloud service that is provided from a country that is not subject to export restrictions (See entitlement for details).

Single Location Deployment

When the service is deployed to a single datacentre, access will be controlled by your network topology and firewall configurations.

Responsiv recommends that the Responsiv Unity Client-Side Bridge Node is used to control all connections between a Responsiv Unity Platform and other systems. Use the appropriate tooling and Responsiv Unity Console to access development and administration.

Multi Location Deployment

Multi-location deployments are when parts of a single Responsiv Unity Platform are deployed to different clouds or datacentres. This type of deployment can be used to optimise cloud data traffic, latency, and resilience. It can be used to create a disaster resilient installation that is active in multiple locations and geographies.

Access to these types of deployment will be like a single location, except that each location may be differently configured.

Recommendation: An optional service preparation package is available to help you set up connections, share certificates for security, and mentor staff on the use of this platform (See Optional Services).

Public Connections

Public Connections are recommended to be passed through a standard DMZ infrastructure to protect the Responsiv Unity Platform, which is not intended for direct connection to public networks. Responsiv provide optional services to support public interactions.

- Responsiv Unity API Bundle
- Responsiv Unity MQ DMZ Gateway
- Standard firewalls

Data Connections

Data Connections are used by systems inside your private network to connect to and from the node using specific protocols. Connections can be encrypted, and mutually authenticated. These connections are explicitly allowed through our firewalls from a named set of Internet Protocol (IP) addresses.

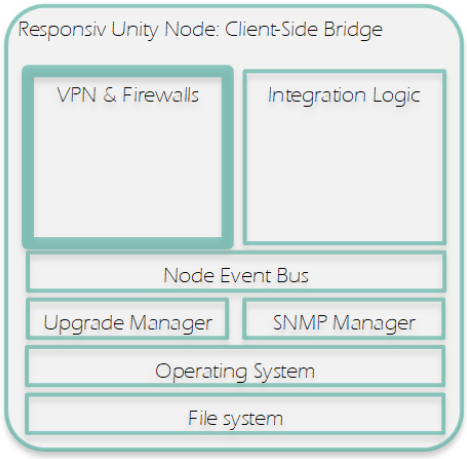
Administrative Connections

Administrative Connections can be established between a Responsiv Unity Platform (Console) and the Responsiv Service Desk. This connection is one-way to allow the console to raise tickets directly in the Responsiv Service Desk. This requires an optional service.

Responsiv can be given access to the self-hosted platform for patching, upgrades, and incident management. The nature of this connection and controls are agreed during service preparation. This requires Responsiv Assist Advanced Support (see Optional Services).

Features

Responsiv Unity Client-Side Bridge can be connected to authorisation systems to protect interfaces and data.



Cloud to Bridge Connections

The client-side bridge is designed to be connected to specific Responsiv Cloud Platforms using internal APIs and security arrangements labelled "VPN & Firewalls". Connections between the cloud and this product can be configured using the following protocols:

1. IBM MQ messaging with Advanced Message Security configured as an MQ cluster for multi-bridge deployments.
2. HTTPS mutually authenticated and load balanced across available bridges.
3. VPN mutually authenticated connections
4. SNMPv3 Monitoring Connection

Integration Logic

The integration logic is hosted to be service connections between the cloud service and the bridge. The cloud to bridge connections have access to a set of APIs used to monitor the bridge and to allow the cloud service to assess its availability and status.

The bridge is accessed through a set of micro service APIs that are installed by adding an "API Pack". Each API pack provides the logic needed to configure the Cloud service to expose and secure a set of APIs and pass information between the cloud and the bridge.

Each API pack installs a set of API stubs to allow the cloud to speak to the bridge about the pack. These stubs reflect the request back to the caller with a status that the API is not configured.

Custom services are needed to extend API Pack stubs to integrate with specific systems that are used by different users. Integration between the bridge and core systems are illustrated by the following:

- Identity Store (customers) All Services Bridge
- Client-Side Bridge All Services Bridge
- Payment Platform Open Banking API315
- Current Accounts Open Banking API315

Core System Integration Services

The Responsiv Unity Client-Side Bridge Node can be used to mediate and orchestrate EAI connections between the cloud service and core systems so that data can be transformed and shared one to many, many to one. Protocols used by one application can be transformed to become compatible with another.

Responsiv Unity Client-Side Bridge Node is a dedicated connectivity/integration solution.

The bridge supports protocols (TCP/IP, HTTP(S), Messaging, File Transfer, Database, SaaS) and integration (Request-Response, Publish-Subscribe, Datagram, Synchronous and Asynchronous). Parsing (REST, JSON, XML, Fixed, Binary), and tooling for integration, including Salesforce and SAP.

Integration services can be used by process applications that are deployed to the platform and by external systems that are suitably authorised. Artificial Intelligence (AI) and other extended functionality can be made available in a secure and managed way through the Responsiv Cloud Services.

File Handling

The Client-Side Bridge uses Data Flow Definition Language (DFDL) to read files and write them, allowing the bridge to generate files for core systems that need them, reports, and accept files to be converted to API calls to the cloud. Files can be processed as a single "file context" or as separate records. In both cases the engine remembers where it is in the process and rolls back or continues after recovery in the case of a failure.

Database and Technology Integration

Technology adapters, including JCA, JDBC, ODBC, are provided out of the box.

Event Capture

Change-Data-Capture (CDC) detects data that needs to be shared, extracts the data from the source system, and shares it with the target systems. RC-IP can manage situations when target systems move, are unavailable, or require special handling.

Data Accessibility allows RC-IP to present a set of consistent and simple to operate interfaces (API services) using message, HTTP, or many other protocols, and using micro service, SOA, RPC, Binary, and custom styles. Services can be protected using SAML assertions that are managed by the Responsiv Cloud Security Service. Data residing in different databases, mainframes, and file systems can be made available as easy to use APIs.

Event and communications handling using synchronous and asynchronous friendly tooling.

Enterprise Package Integration

Specific interrogative connectors are available for Salesforce, MS-Dynamics, SAP, and other enterprise platforms. These are used to quickly understand any customisations performed inside such packages and create robust bi-directional connections.

For specific connectors and connector development please refer to

https://explorer.automation.ibm.com and https://explorer.automation.ibm.com/assets/templates

Production

The production environment can be configured with a single Client-Side Bridge Node, however an "Integration cluster" is recommended to consist of at least two nodes. Clusters provide mutual fault tolerance within themselves, and are configured to multi-path, allowing the entire environment to maintain service in the event of a component failure.

You deploy configuration changes to messaging objects, integration applications, and process applications to maintain their availability.

Development and Test Environments

Two independent environments are recommended to facilitate development and user testing. Having two allows user testing to continue independently of production operations and without interfering with development. Developed applications are typically promoted to user test and on to production. These can be non-high availability configured.

Capacity

Responsiv Unity Node entitlements are made available based on a single measure (primary metric) to simplify purchasing and comparison with other middleware software providers. Primary metrics used by Responsiv to size our Responsiv Platforms include concurrent or named users, rule executions per hour, transactions per hour, and volume of data.

Optional Services

Optional services are available to extend the capabilities or capacity of Responsiv Unity and other products. The following list is not exhaustive.

Please review all Responsiv Unity products for more information.

RK00017 Responsiv Consulting Service Preparation

Short duration fixed price consulting engagement to help new customers to (1) securely connect to Responsiv Cloud, and to get started with the Responsiv Cloud Service, or (2) to establish a managed service.

Migrating critical business process infrastructure is impactful to operations and must be done in a way to minimise unnecessary risks and unforeseen costs. Moving platforms or cloud providers requires planning and preparation.

RT00094 Responsiv Assist Flex Support

Responsiv Unity Client-Side Bridge Node is supported by Responsiv as part of your subscription. Responsiv Assist Flex Support adds support for problems not included in the warrantee, for example to recover, repair, or work around problems in your core system integrations.

An annual agreement allows customers to make service requests asking for help with development, designs, problem resolution, and other mentoring and support subjects. You may request support with recovering from an incident, however this service does not offer and is not strictly suitable for incident response. (See Responsiv Assist Advanced Support).

This service allows Responsiv Support to extend from the platform to include user applications and other aspects of your installation.

RA0028J Responsiv Unity MQ DMZ Gateway

This product complements the Responsiv Unity Enterprise Messaging products and provides a lightweight, secure component that operates in a DMZ to facilitate secure messaging between clouds by allowing secure messaging to pass through a DMZ network topology and architecture. This allows your messaging connections to connect self-hosted systems in your private datacentre to systems in different clouds and to Responsiv Cloud Platforms. This product can participate in MQ clusters and HA configurations.

An initiating queue manager connects to this product network address and passes details of the target queue manager. The product passes the details on by creating a new connection using different port numbers to prevent information about your internal address ranges from leaking across the DMZ. The product does not store any information and does not participate in transactional activity on the channel - making it transparent to the connected end points.

Connections are expected to be secured using TLS controlled in the normal way for IBM MQ Channels. This Responsiv Node includes operating system, port forwarding software and monitoring functionality.

RA0019B Responsiv Unity Integration Kit

This toolkit installs on an existing Responsiv Unity Client-Side Bridge Node to allow programmers to integrate their applications with the node.

Developer and Administrator Tooling

Responsiv Unity Client-Side Bridge Node Service provides low-code, graphical, and extended SQL options to describe your integration needs between the bridge (API Pack) and core systems.

The Responsiv Unity Client-Side Bridge Node includes a wide range of tools to accelerate development of robust connections for both popular enterprise applications (SAP, MS Dynamics, etc.) as well as niche systems. A wide range of integration styles can be accommodated from the common synchronous REST through to the asynchronous publish and subscribe.

A console provides comprehensive management of all the components using advanced analytics, business rules and collaboration to drive more successful, optimised business outcomes.

Integration Development

It includes a downloadable desktop integrated development environment (IDE) with features to develop, debug, and test integrations. Tooling includes graphical elements with drag and drop in a modern and intuitive layout, which requires no previous experience with programming languages in general. Features include distributed debugging and integration data inspection.

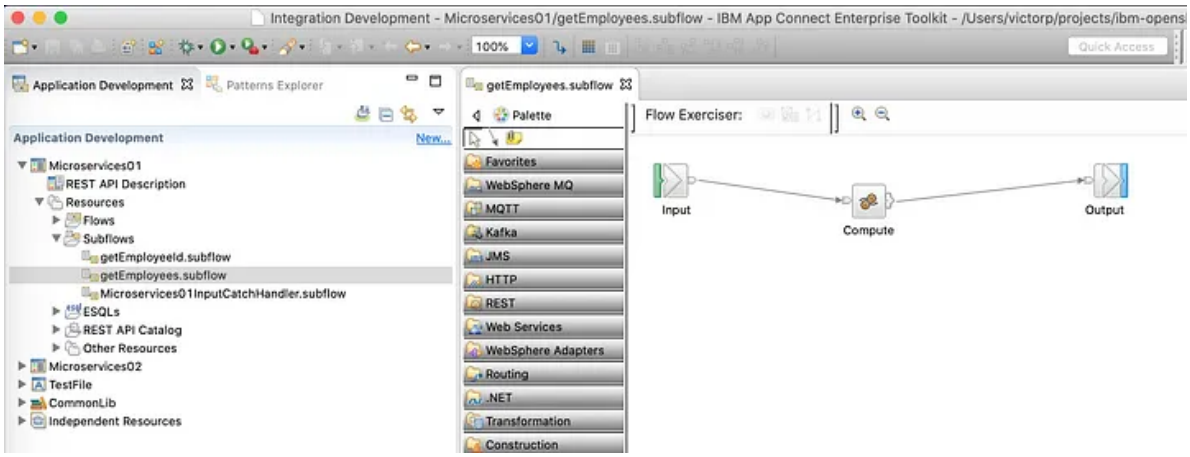


Figure 1; Integration Developer IDE illustration[1]

Developers use a low-code graphical development environment that allows them to move into Extended SQL, Java, and other languages that may be more appropriate for a particular problem, or that already exist and can be reused.

The illustration above shows an input node listening for messages arriving on a queue. The listener (input node) is configured to listen to the queue by adding the queue name and ticking a box to select how the flow will protect data in the event of a failure. The message is read and parsed into a standardised format for processing by the compute node.

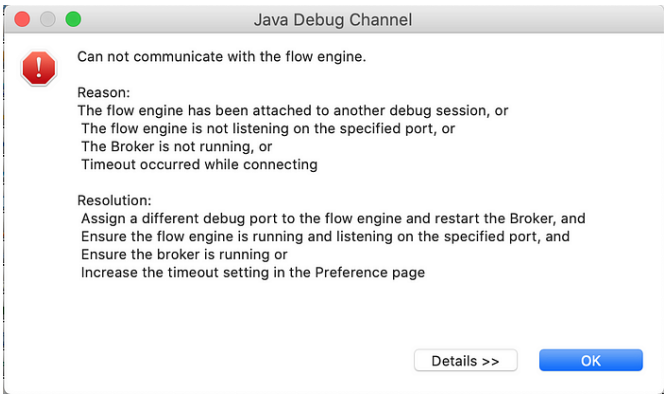
Standardised format means that the format of the input, which could be XML, JSON, Cobol Copybook, C-Header (fixed), or other) does not impact processing. The parser also deals with code page changes and big-little endian numeric.

The compute node can take many forms and perform work described using a graphical mapper or using a high-level programming language. The input message can be enriched with data from a database, file, API, or another message.

The output node is then used to write the message to one or more message queues, APIs, or other channels (See supported protocols).

Debugging is facilitated by a powerful debugger and error messages that are descriptive and useful.

The illustration is for Java. Other languages and no-code configurations are also supported.



[1] https://medium.com/@victorpaulo/debugging-ibm-ace-applications-using-kubernetes-c4b77d583907

Messaging Configuration

Browser based configuration of message queues, message security, and other messaging objects.

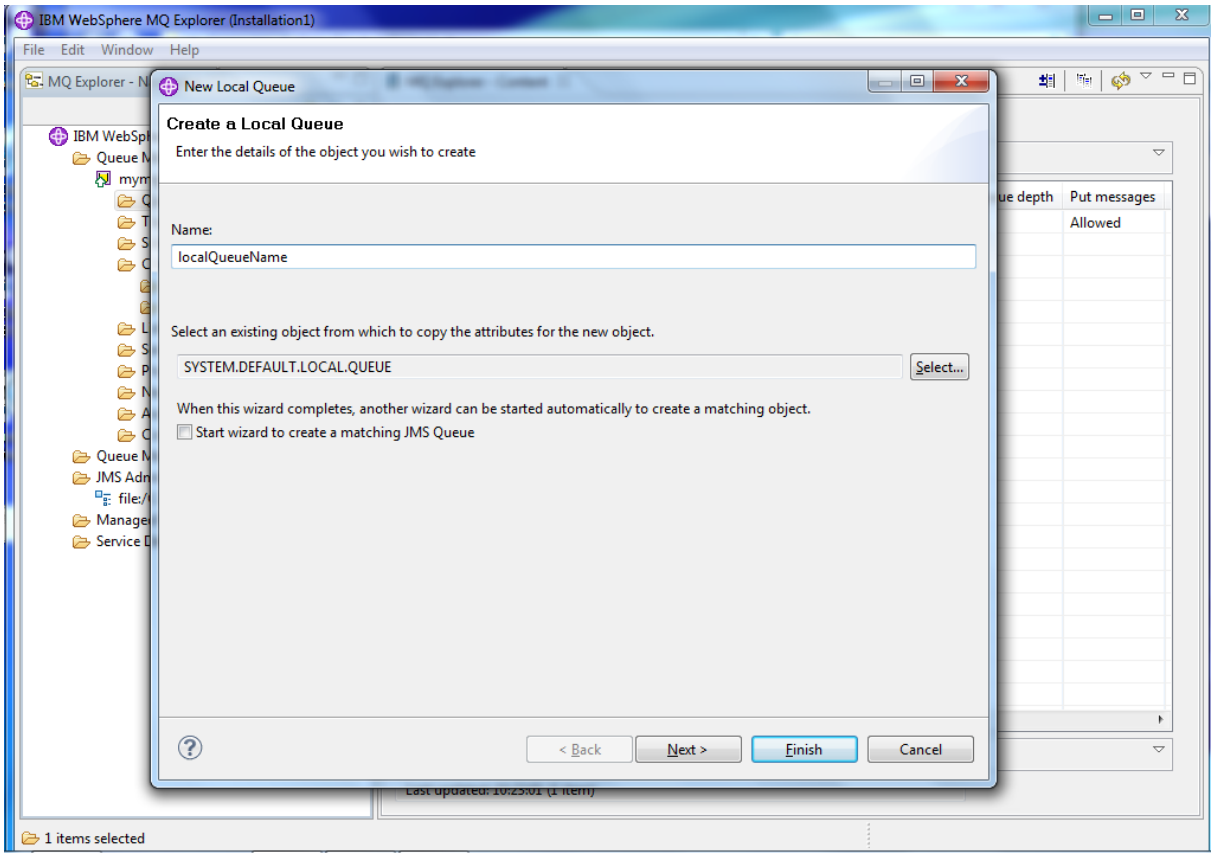


Figure 2; IBM MQ Queue Creation Dialogue[2]

IBM MQ is used in Responsiv Unity Client-Side Bridge Node to provide a fully functional XA transaction coordinator and resource manager. It provides efficient message handling but is not necessary for developers using HTTP and non-message-oriented protocols.

Performance and Tuning

You can change various aspects of your configuration to tune integration servers and message flows, and to monitor message flows and publish/subscribe applications. You can also send logging information to an Elasticsearch, Logstash, and Kibana (ELK) server, and view the data in a Kibana dashboard. Open Telemetry trace is supported for callable flows and MQ, HTTP, REST, and SOAP nodes on configured integration servers.

https://www.ibm.com/docs/en/app-connect/12.0?topic=software-performance-monitoring-workload-management

[2] https://malalanayake.wordpress.com/tag/ibm-mq-client/

Supported Protocols

Connectors are used by Responsiv Unity Client-Side Bridge Node to interact with external applications and data sources. It is possible to develop custom connectors, however, there are many connectors provided out of the box.

Please note that the Responsiv Unity Client-Side Bridge Node does not warrant that all features and connectors are available from the Responsiv Platform.

Custom Connectors

Custom connectors are required to handle stateful dialogues and protocols that are not directly supported by the platform, for example, when integrating with a system developed in-house.

https://www.ibm.com/docs/en/app-connect/11.0.0?topic=connectors-overview

After you create a user-defined node for your connector, you can test it by adding it to a message flow in the IBM App Connect Enterprise Toolkit. You add a user-defined node for a connector in the same way that you would add any node to a message flow. You can use debugging and logging tools to ensure that the user-defined node is behaving as expected.

https://www.ibm.com/docs/en/app-connect/12.0?topic=connectors-testing-connector-in-app-connect-enterprise

You can connect through web services, or access data directly from a database to connect to applications. However, you can also use the connector framework to develop a connector for a specific application or technology. You can use the connector framework to build reusable connectors that are not already available, reducing the need to build these interactions manually every time you need them. A connector can encapsulate complex interactions that you would otherwise achieve by using multiple message flow nodes.

Provided Nodes and Connectors

Built-in nodes provided in the IBM App Connect Enterprise Toolkit are divided into two groups: Toolbox and Connectors.

https://www.ibm.com/docs/en/app-connect/12.0?topic=development-built-in-nodes

Toolbox Nodes

Toolbox nodes provide functions for transforming, manipulating, collating, and enhancing messages, creating subflows and callable flows, making decisions, controlling time-sensitive operations, and handling and reporting errors.

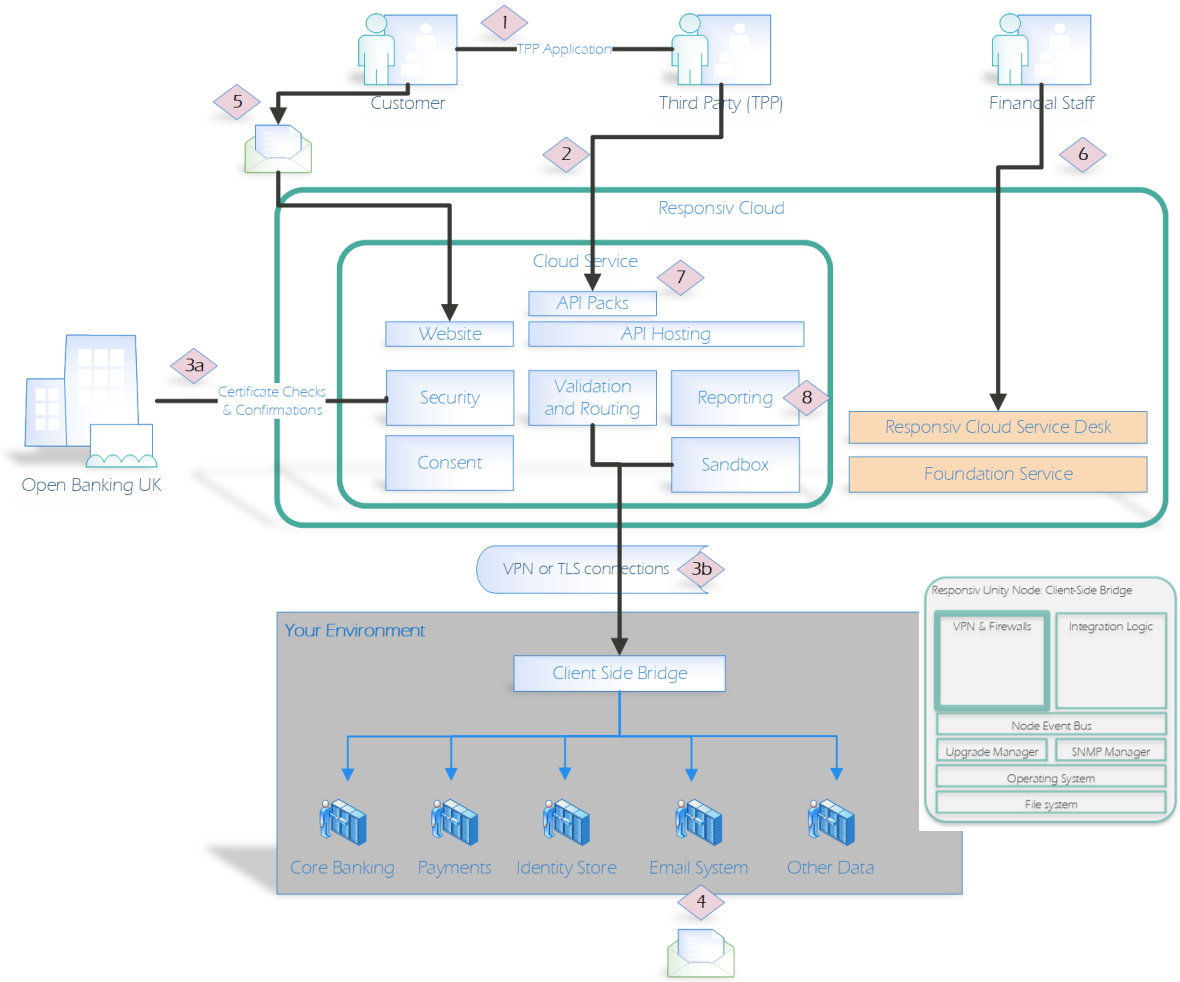
Control	Grouping	Routing	Security	Timer	Transformation
Callable flow	AggregateControl node	Filter node	SecurityPEP node	Scheduler node	Mapping node
CallableInput node	AggregateReply node	Label node	Subflows	TimeoutControl node	XSLTransform node
CallableReply node	AggregateRequest node	RouteToLabel node	Input node	TimeoutNotification node	Compute node
CallableFlowInvoke node	Collector node	Route node	Output node		JavaCompute node
CallableFlowAsyncInvoke node	GroupScatter node	FlowOrder node			ResetContentDescriptor node
CallableFlowAsyncResponse node	GroupGather node	Resequence node			
Error handling	GroupComplete node	Sequence node			
Throw node		Passthrough node			
TryCatch node					
Trace node					
Validate node					

Protocol Connectors

Connectivity Nodes enable direct connections from applications and can be used to send direct requests to other application endpoints. They can also be used to connect to various subsystems including Enterprise Solutions, IBM MQ, files, and databases, to read and write existing application data, and to support protocols such as TCP/IP, MQTT, and HTTP.

Architecture

The Client-Side Bridge is a reverse proxy representing all the systems of a client. The cloud service has a trusted relationship with the reverse proxy and has no sight of the structure, network topology, security arrangements, or systems of the client. Instead, the cloud service sees a well-defined set of APIs that have been designed to optimise its access and use of those internal services.



The validation and routing component of the Open Finance Gateway is also known as the Gate-Side-Bridge. It connects over well defined, mutually authenticated channels, to the Client-Side-Bridge. Requests are passed to the logic on the Client-Side Bridge to be executed against the client's internal systems. APIs can be configured to allow client systems to make requests of the Gate-Side-Bridge.

[1] A customer uses a mobile application or other TPP interface to request a payment or information about their account. The TPP [2] calls the API provided by an API Pack, which is secured according to [3a] Open Banking or Open Finance standards.

The API Pack [7] provides routing and content security features as defined by the specific APIs and appropriate standards.

Reports about performance of the gateway are generated [8] and available as needed. They include - Sanitised Record of each API call, number of retry and failed calls, latency, and other information required by the regulator.

[3b] Traffic passing in either direction is subjected to firewall and application-level inspection.

Service Management

Responsiv manages the Responsiv Unity Support and Subscription service, including active health monitoring, patching, upgrades, and general maintenance. The service is monitored 7x24, and customer can request support through raising a help desk ticket.

Service Preparation

This service must be prepared by Responsiv. Multi and single node installations involve connecting to the Responsiv Asset Download Gateway and downloading the specific node, which can be installed individually.

Service Level Agreement

This software is supported by Responsiv from our UK offices.

The service includes product/platform support only and is triggered by automated monitoring built into the platform or manually accessed from our website https://responsiv.co.uk/support-hub/support/.

Upgrade and Patching Schedule

We expect to release a major upgrade annually and security and critical patches efficiently as they become available. Patches are categorised as follows:

- Security – Patch specifically or including for a security flaw or weakness.
- Critical – Patch will be required to be applied before support attempts to resolve a problem.
- Optional – Specific function bug resolution. Optional depending on use cases.

Responsiv makes patches and upgrades available on the Responsiv Asset Distribution Service. This product does not include entitlement for Responsiv to apply those things. Customers who require Responsiv to perform upgrades and patching should consider Responsiv Assist Advanced Support.

Continuous Improvement

Responsiv does not commit to future development or support beyond our contractual obligations. Responsiv Cloud Platforms and Responsiv Cloud Services are continually developed and maintained.

New features may be provided as optional expansions to the base platform or may be installed as standard.

Format and Charging Measures

This product is available in the following formats:

- Responsiv Unity self-hosted Node
- Responsiv Unity self-hosted Node BYOL (no operating system, no content)

This product supports charging by instance, registered users, and duration. Entitlements can use a combination of charging measures that are appropriate to the intended purpose.

Related Products

This Responsiv Unity Client-Side Bridge Node contains capabilities that are closely related to the following products and services. IBM products, including support and subscription part numbers are listed here to help existing IBM customers to understand what this platform contains. Not all products listed are required to deploy these services.

E02AULL	IBM App Connect Enterprise Processor Value Unit (PVU) Annual SW Subscription & Support Renewal 12 Months
D56P3LL	IBM App Connect Enterprise Processor Value Unit (PVU) License + SW Subscription & Support 12 Months
E0N2MLL	IBM App Connect Professional Virtual Processor Core Annual SW Subscription & Support Renewal 12 Months
D1Q6BLL	IBM App Connect Professional Virtual Processor Core License + SW Subscription & Support 12 Months
E04NRLL	IBM App Connect Standard Processor Value Unit (PVU) Annual SW Subscription & Support Renewal 12 Months
D03S0LL	IBM App Connect Standard Processor Value Unit (PVU) License + SW Subscription & Support 12 Months
D20ZBLL	IBM Cloud Pak for Integration Virtual Processor Core License + SW Subscription & Support 12 Months
D20ZELL	IBM Cloud Pak for Integration Virtual Processor Core SW Subscription & Support Reinstatement 12 Months
D55V1LL	IBM MQ Processor Value Unit (PVU) License + SW Subscription & Support 12 Months
D22VVLL	WebSphere MQ Advanced 100 Virtual Server LIC + SW S&S 12 MO