

Nirvana

A Technical Introduction

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Agenda

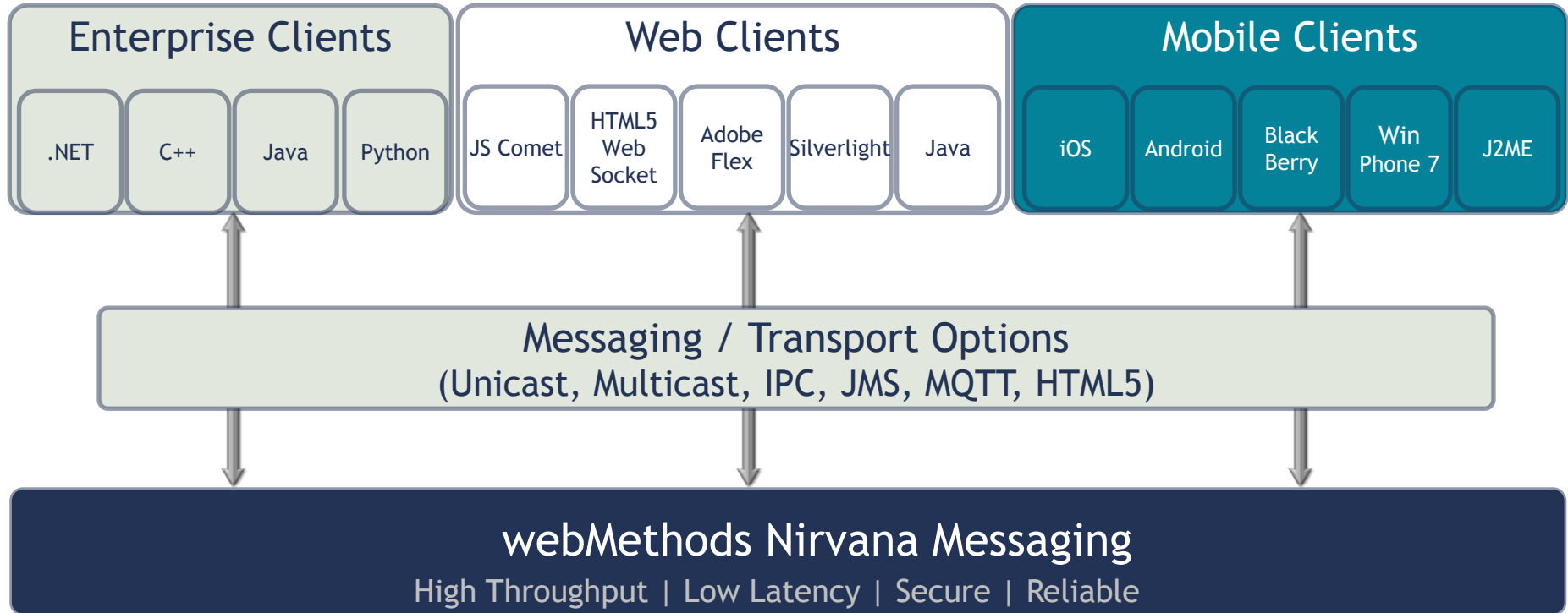
- Product Overview
- Client Delivery Modes
- Realm Features
- Management and Administration
- Clustering & HA
- Scalability & Performance
- Getting Started

Nirvana

Product Overview

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webMethods Nirvana Messaging - The Universal Middleware



Nirvana

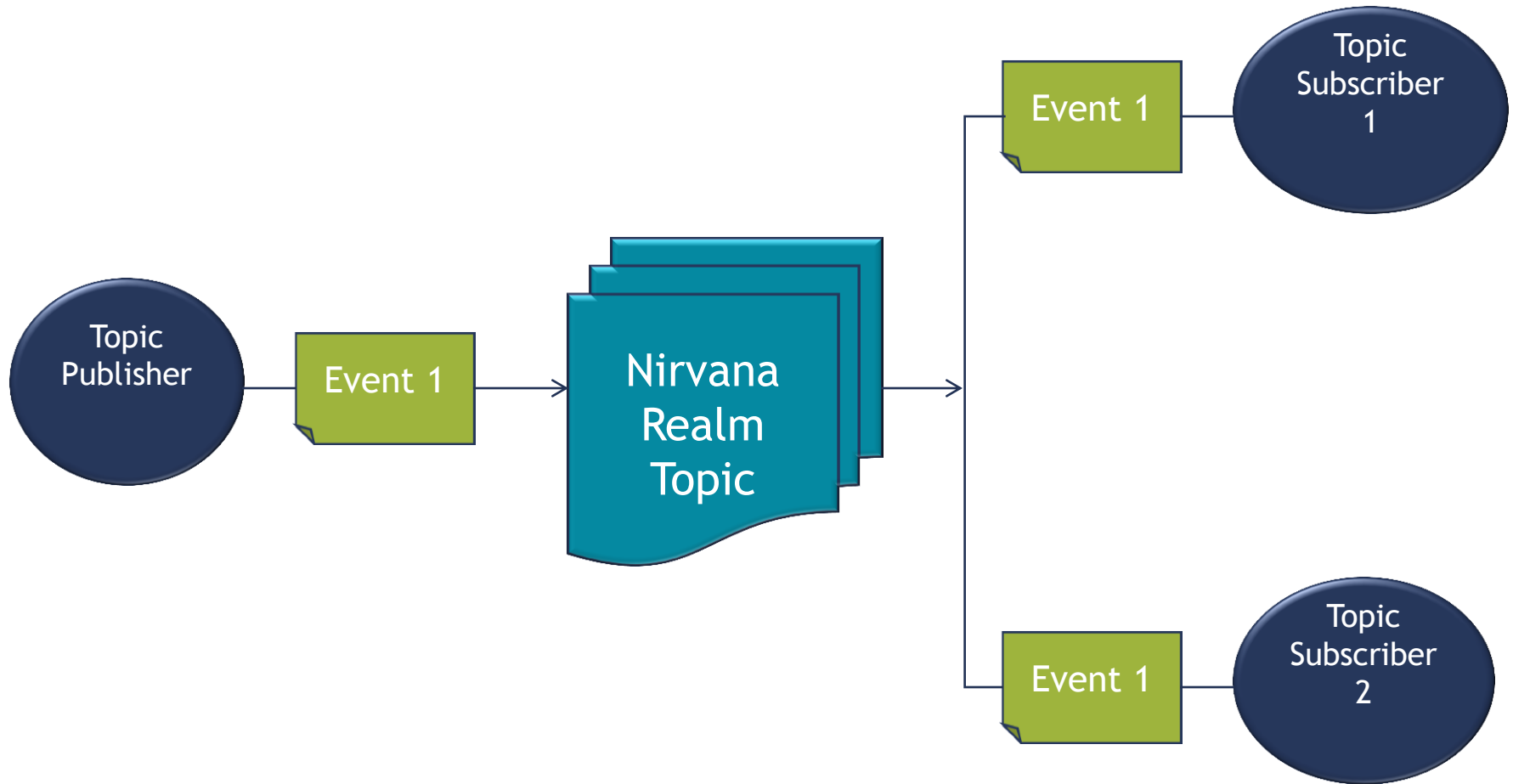
Client Delivery Modes

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Delivery Mode: Channels/Topics (Pub/Sub)

- Individual messages delivered to multiple consumers
- Producers and consumers are decoupled
- Ideal for delivering same messages to multiple users

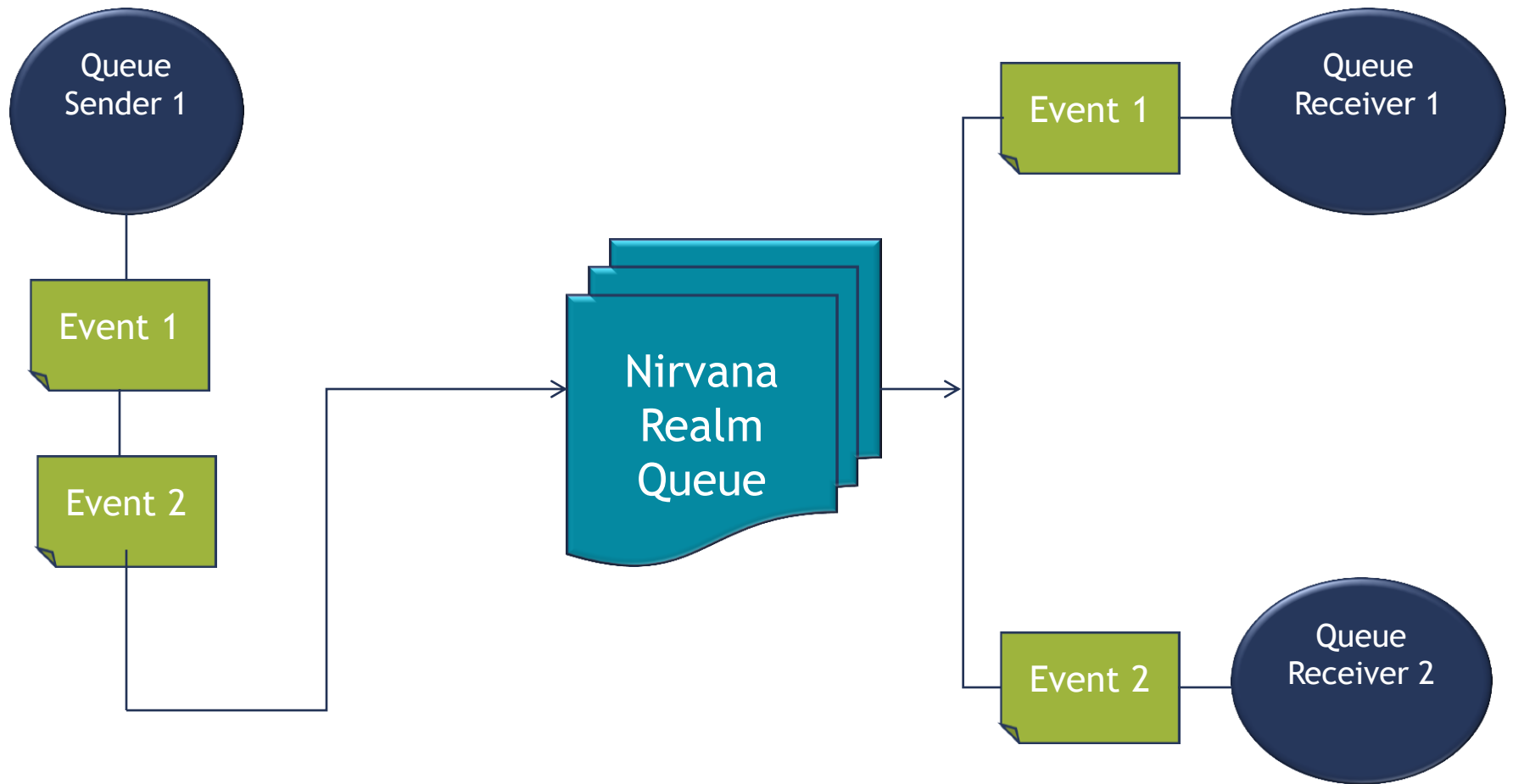
Delivery Mode: Channels/Topics (Pub/Sub)



Delivery Mode: Queues

- Each message delivered to one and only one consumer
- Messages are removed on delivery
- Ideal for implementing transactional request/reply style interactions

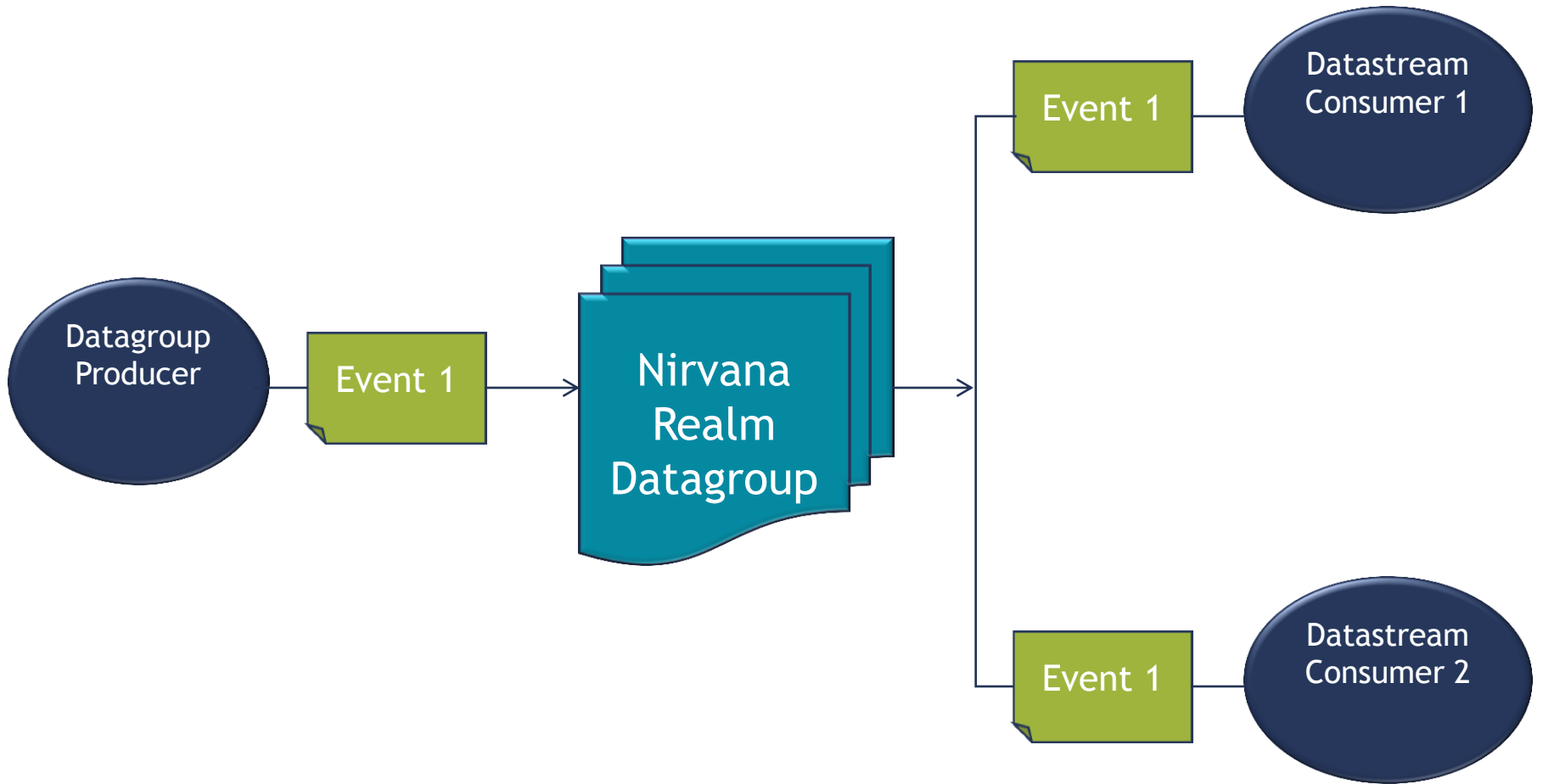
Delivery Mode: Queues



Delivery Mode: DataGroups

- Dynamic structure supporting remote subscription management
- User membership of one or more groups determines messages received
- Producers actively aware of / in control of group membership
- Ideal for transparently delivering messages to dynamic categories of users

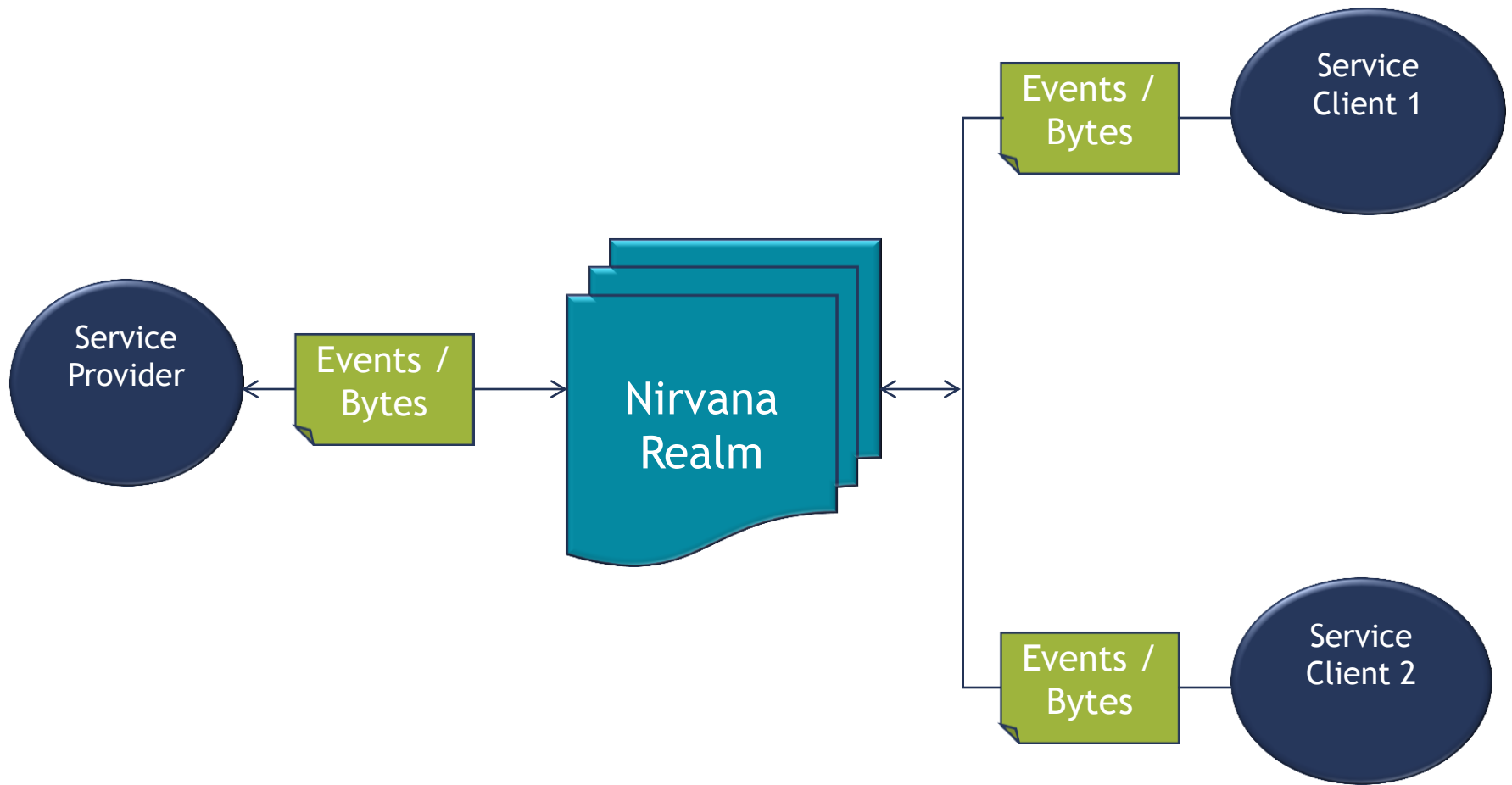
Delivery Mode: Datagroups



Delivery Mode: P2P

- Two types of P2P service, Stream based or Event based
- Provides a One to One communication session
- Similar to socket concepts
- Stream services have Input / Output stream, read / write bytes
- Event services send / receive events

Delivery Mode: P2P



Nirvana

Realm Features

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Nirvana Realm Features

- Multiple protocol and standards supported
 - Unicast, Multicast and IPC messaging
 - Sockets, SSL Sockets, HTTP, HTTPS
 - JMS, MQTT, HTML5
 - HTML5 Websocket , XHR-Streaming-CORS , XHR-Longpoll-CORS , XDR Streaming/Longpoll, JSONP Longpoll , NoCrossDomain IFRAME Streaming , EventSource Streaming

Nirvana Realm Features

- Interfaces
 - Binding different protocols to different physical interfaces
 - Multiple SSL certificate chains
 - Plugins - File (Web Server), XML, SOAP, REST, Servlet, ProxyPassThrough
 - NIO / Non NIO
 - HTTP/1.0, HTTP/1.1
 - Synchronous / Asynchronous delivery
 - Multicast
 - IPC via Shared Memory (SHM)

Nirvana Realm Features

- Scheduling and Triggers support
- Security
 - Authentication
 - Entitlements
 - VIA Rules, i.e. authentication restrictions by interface and protocol

Nirvana Realm Features

- **Extensive Channel / Topic / Queue / DataGroup Attributes**
 - **Channel Keys** - Nirvana can manage channel events based on content
 - **Channel Types** - Transient, Simple, Reliable, Persistent, Mixed
 - **Age / Capacity** - set event TTL across channels / topics / queues, or capacity
- **Dead Message Stores**
- **Fanout Engines** - Standard with Replay, JMS Fanout, Merge
- **Conflation** - Merge Engine, Delta Delivery, Last Value and Throttling
- **Additional Properties** - Disc Sync, Capacity Honouring, JMS Engine

Nirvana Realm Features

- Publishing
 - Transactional
 - Asynchronous

- Consuming
 - Synchronous (Transactional, Reliable)
 - Asynchronous (Transactional, Reliable)
 - Named Subscriber Priority

- Selectors - Advanced Filtering on embedded dictionaries, arrays, data
 - Nested arrays and Dictionaries : `ccy[].name = 'eur'`
 - Event data byte[]: `EVENTDATA.AS-BYTE(0) = 16`
 - Time and Location: `Data_Sold < (NOW() - 86400000)` or `DISTANCE(Lat, Long, Units)`

Nirvana Realm Features

- Multiple Enterprise Languages - Common APIs
 - Pub / Sub
 - DataGroups
 - Message Queues
 - Peer 2 Peer (P2P)
 - JMS (Java)
- Interoperable - Common event model, for example
 - Publish JMS, consume in C++, Silverlight Or Native C#, Javascript
- Multiple Protocol Support In All APIs
 - Sockets (nsp), SSL Sockets (nsps), HTTP (nhp) & HTTPS (nhps)
 - For example :
 - Publish C++ Internally (nsp)
 - Consume Silverlight (nhp(s)) & Java (nhp(s)) externally
 - Proxy Support - Basic Auth, Proxy Connect (nhpsc), NTLM etc
 - MQTT, HTML5

Nirvana Realm Features

- Message routing (Joins)
 - Local routing (same realm)
 - Inter-realm routing
 - Inter-cluster routing
 - Optional message selector (content based)
 - Arithmetic operations and functions on selectors (e.g. distance)
 - Dynamically managed through Admin API
 - Automatic cyclic path prevention on bidirectional joins
 - Support for redundant routing paths
 - Max intermediate hop limit policy
 - Optional purge support
- No additional Components Required (No Web Server, Servlets, translators, connectors etc)

Nirvana Realm Features

- Multicast (Java / .NET / C++)
 - Currently offered for Datagroups / Cluster communications only
 - Server binds to multicast address on an interface's unicast address
 - Server sends multicast configuration to clients / slave nodes over unicast
 - No configuration required on the client!
 - Encryption key rotates and updates sent over unicast
 - Nirvana provides layer on top of UDP for guaranteed delivery(ACK window, NACK window)
 - Falls back to unicast

Nirvana Realm Features

- Inter Process Messaging IPC (Java / C++)
 - Using Shared Memory (SHM)
 - Extremely low latency for processes in the same box
 - Support for client APIs, admin APIs and Cluster communications
 - Requires multicore hardware

Nirvana

Management and Administration

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Management & Administration

- **Principles**
 - Use Nirvana to manage Nirvana : Admin API Based on Java Client API, same drivers / protocols, security, etc
 - Remote asynchronous monitoring information of multiple realms
 - Remote configuration / management of multiple realms / clusters

- **Monitoring**
 - Connections, Threads, Memory, Logs, Topics, Queues, Audit, Throughput, Data
 - JMX Mbeans

- **Configuration / Management**
 - Configuration Parameters, Realm Security, Topic / Queues, Interfaces, JNDI (JMS Bindings), Clusters, Scheduling

- **Graphical Tool - Nirvana Enterprise Manager**
 - Developed using the nAdmin API
 - Every aspect of the tool has corresponding API
 - Monitor / Manage / Configure multiple realms and clusters from anywhere

Enterprise Manager

File Connections Cluster Help

Nirvana Enterprise

- Clusters
 - test
- Realms
 - nirvana
 - Data Groups
 - fxdemo
 - chat
 - news
 - prices
 - trades
 - naming
 - nirvana2
 - nirvana3

Summary Storage Properties

Attributes

Name	news
Type	Reliable
Age	259200000
Capacity	150
Engine	Default

Publish Keys

From: _____

To: _____

Filter: _____

Event Id	Tag	TTL	Persistent
336		0	<input checked="" type="checkbox"/>
335		0	<input checked="" type="checkbox"/>
334		0	<input checked="" type="checkbox"/>
333		0	<input checked="" type="checkbox"/>
332		0	<input checked="" type="checkbox"/>
331		0	<input checked="" type="checkbox"/>

```

0: 68 74 74 70 3A 2F 2F 77 77 77 2E 66 6F 72 62 65
16: 73 2E 63 6F 6D 2F 73 69 74 65 73 2F 65 72 69 63
32: 73 61 76 69 74 7A 2F 32 30 31 32 2F 30 36 2F 31
48: 34 2F 6E 65 74 66 6C 69 78 2D 74 65 73 74 69 6E
    
```

h t t p : / / w w w . f o r b e s . c o m / s i t e s / e r i c s a v i t z / 2 0 1 2 / 0 6 / 1 4 / n e t f l i x - t e s t i n g

Key	Value	Type
rss_link	http://www.forbes.com/sites/eric savitz/2012/06/14/netf...	String
chat_from	Forbes	String
msgType	1	int
title	Netflix Testing Site Redesign With Separate Movie, TV Tabs	String
description	Netflix is testing a revamp of its website that would have...	String
chatmsg	<a class="link" title="Netflix Testing Site Redesign With ...	String
id	newsmg	String
nrvpub.host	127.0.0.1	String
nrvpub.name	akritikos	String
nrvpub.time	Thu Jun 14 17:25:13, 2012	long

Nirvana

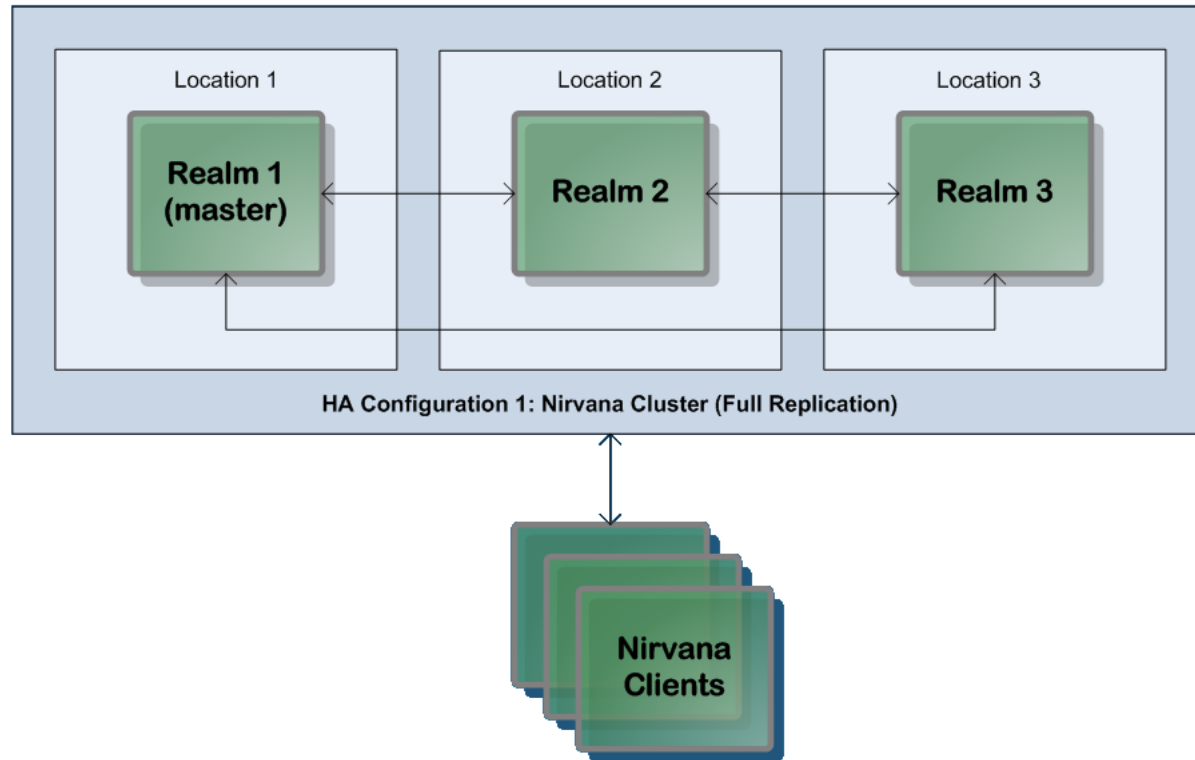
Clustering & HA

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Nirvana Clustering & HA

- Nirvana Cluster is a group of connected Nirvana Realms
- Clustering technology used successfully by SDPs for 10 years
- Cluster replicates data and state
- Master / Slaves
- Quorum
- Recovery
- All nodes are active
- Resilience and HA
- Load balancing

Typical Nirvana Cluster



Nirvana

Scalability & Performance

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Scalability

- Very high concurrent connection support
- Federated namespace support
- Unlimited node true clustering
- Inter-realm & inter-cluster event replication with optional filtering

Performance

- Very high message throughput
- Low latency
- Client Recovery for slow subscribers
- Sophisticated threading and memory models
- Heavily optimized IO subsystem
- Automatic peak / burst detection
- Highly tuneable for different models (e.g. latency, throughput)

webMethods Nirvana Messaging Customers

Customer Successes

- Global customer base
- Market-leading vendor for high-performance messaging
- Powers 2 of the top 3 market-leading Foreign Exchange platforms

Tier 1 and Tier 2 Global Financial Institutions



What can you do next?

1

Try Nirvana For Free

Developer License is Free

Download URL:

www.softwareag.com/GetNirvana

2

Run Our Demo

- Our standard install includes all demos and source code
- www.softwareag.com/NirvanaDemo