Market Requirements Document

Feature Name: Infiniband Support

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Description of the Problem

Infiniband™ is an increasingly popular switched fabric communications link that is used in a large number of High Performance Computing (HPC) environments. Objectivity/DB can run without change on an operating system and hardware that use Infiniband, but it takes no advantage of its advanced performance and architectural features.

Background

InfiniBand features include quality of service and failover and it is designed to be scalable. The InfiniBand architecture specification defines a connection between processor nodes and high performance I/O nodes such as storage devices. InfiniBand forms a superset of the Virtual Interface Architecture.

Infiniband provides:
- User-level access to message passing.
- Remote direct memory access (both read and write modes)
- Up to 2 GB of data can be moved in a single request.

Objectivity/DB could exploit Infiniband to move data (pages) between clients and Advanced Multithreaded Servers (AMS).

Description of the Requested Feature

Direct kernel support for Infiniband (or the Virtual Interface Architecture) that exploits its performance features. Besides using its fast messaging capability (instead of standard TCP/IP) the kernel and AMS could also be configured to:
- Allow a client to request a page, receive a remote memory pointer, then move one or more pages directly from a pre-cached AMS memory to the regular client side cache. This would considerably improve streaming speeds.
- Allow a client to move blocks of data (one or more pages) directly into a remote AMS memory cache for a particular file. This would improve data ingest and most commit operation speeds.
- Allow AMS to directly read one or more pages from its local disk and write them directly into a client side Infiniband remote (to the AMS) memory cache.

Part of an existing feature or does it require another feature, if so, which one?

- Enhances performance in configurations that use Infiniband hardware.

How is this problem being solved now, and why isn't that acceptable?

Objectivity/DB has been run in configurations that use Infiniband, but without exploiting the performance features.

What languages must support this capability?

- C++
- Java
- SQL++

Which platforms must be supported?

- Linux, Windows and Solaris.

Do any competitors already have this feature?

- No.

Customers who require this feature

- HPC applications.

Revenue at risk, or which could be won

- This will allow us to leverage relationships with hardware providers, such as DDN.
- It will give us a competitive performance edge in HPC environments.

When is this required?

- Release 11.

Additional Notes

1. Related Material

We will also need:

* Marketing collateral, including a Press Release.

* Technical Publications.

* Release Note.

* Extra Quality Assurance Material, particularly performance tests versus regular AMS and local connections.

2.   Hardware Requirements

Engineering will require access to Infiniband hardware, either within the network or at a partner. A 20-port Infiniband switch costs around $6K. Each computer connected to it will need a port card.