

SQL Anywhere 16

Data Synchronization New Features

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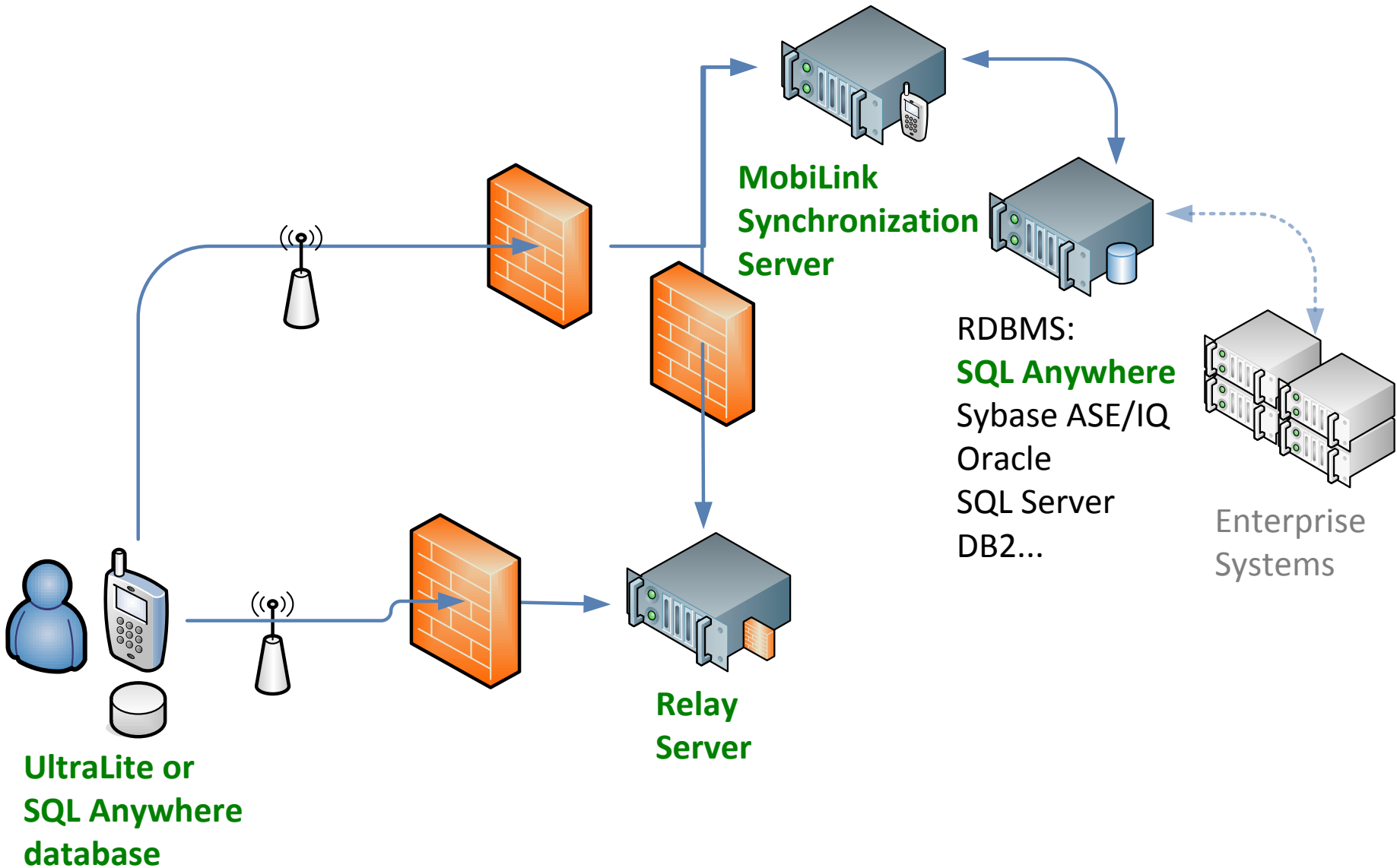
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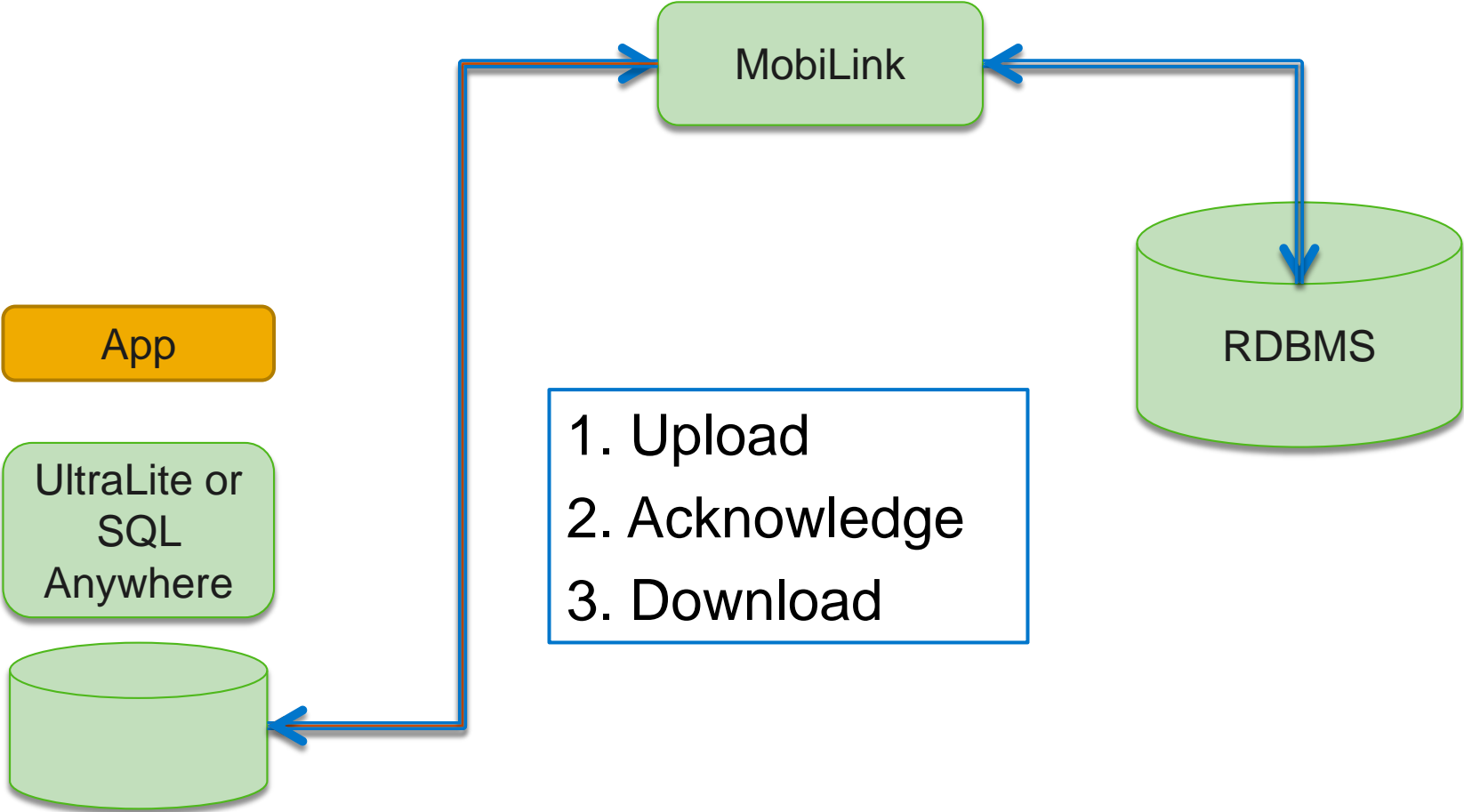
Introduction



SAP Sybase SQL Anywhere Data Synchronization



The Synchronization Process



Intuit, Inc.

IN BRIEF

Intuit, Inc. is a leading provider of innovative business and financial management solutions for small businesses, consumers, accounting professionals and financial institutions.



Better
productivity
of Intuit engineers
reduces costs



Improved **insight**
through
More ways to
analyze data

▶▶ SAP SQL Anywhere provides QuickBooks users with accurate, easier data management

Business Challenges

- Provide millions of QuickBooks users with fast, efficient, and powerful data management capabilities

Solution

- SAP Sybase SQL Anywhere data management and synchronization

Benefits

- Increased product functionality and performance
- Gives user more ways slice and dice customer data
- Improved productivity for Intuit engineers



SAP Sybase SQL Anywhere has provided us with a fully functional relational database that is cost-effective, maintenance-free, and continuously evolving.



Siddarth Ram, Group Architect, Intuit

IN BRIEF

Since its founding in 1957, Berner has grown to become the leading European direct seller to professionals in the construction and automotive industries.



Delivers high
performance
to field sales teams



Protects against
outages with
reliable data
synchronization

▶▶ SAP SQL Anywhere provides field sales team with up-to-date access to information

Business Challenges

- Large sales force needs accurate, up-to-date information when meeting with customers in the field

Solution

- SAP Sybase SQL Anywhere data management and synchronization

Benefits

- Fast and reliable data transfer at the touch of a button
- Reliable data synchronization even in occasionally connected environments
- Extends SAP application functionality to field sales teams with high performance

NEPTUNE TECHNOLOGY GROUP INC.

IN BRIEF

Neptune is a pioneer in the development of Automatic Meter Reading and Advanced Metering Infrastructure technologies with over nine million radio frequency meter reading devices installed in the United States.



Eliminated **hundreds** of support visits to field sites



Lower costs through improved efficiencies

▶▶ SAP SQL Anywhere powers data collection of over 10 million utility meters

Business Challenges

- Remote meter readers were crashing on a weekly basis, requiring Neptune to stop what they were doing and re-boot the devices in the field.

Solution

- SAP Sybase SQL Anywhere data management and synchronization

Benefits

- Fewer crashes in the field eliminates hundreds of support visits annually
- Data workflow experiences less disruption
- Reduced costs by enabling multiple meter reading sites to be managed by fewer customer service managers

Highlights

MobiLink

Performance

Synchronization to SAP HANA

Tooling

Relay Server

IIS 8.0

Quick Setup

Improved Proxy Support

Security

Mutual authentication

LDAP Authentication

UltraLite

In-memory caching

Numerous BlackBerry improvements

Sync statistics monitoring

MobiLink



Performance: Threading Architecture

Motivation

Customers would say their system is faster with multiple servers on one machine, or that compression made their system much slower

Internally, very large tests were CPU bound on network stream compression

Diagnosis

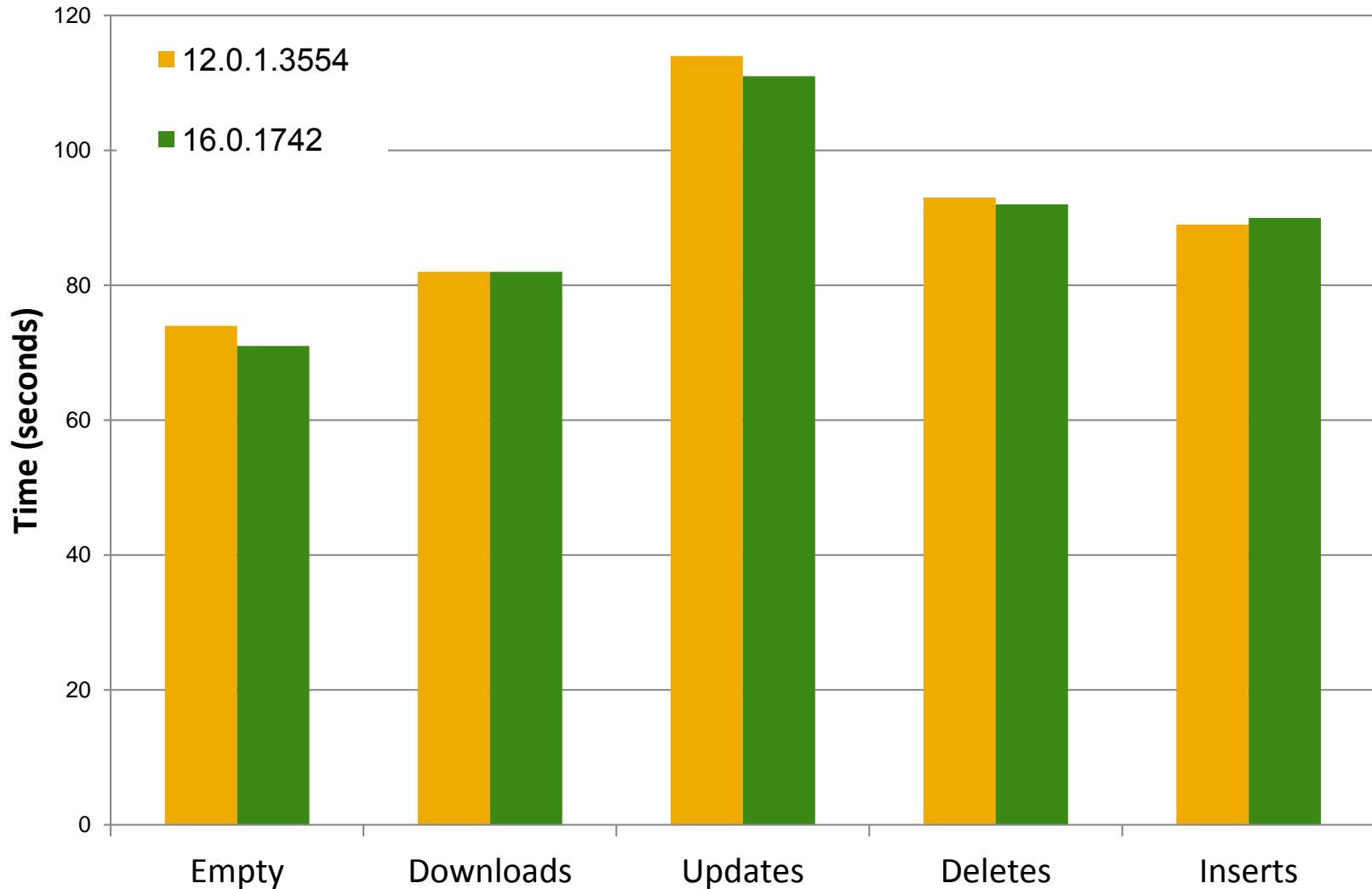
A single thread per server processing network compression and encryption

Solution

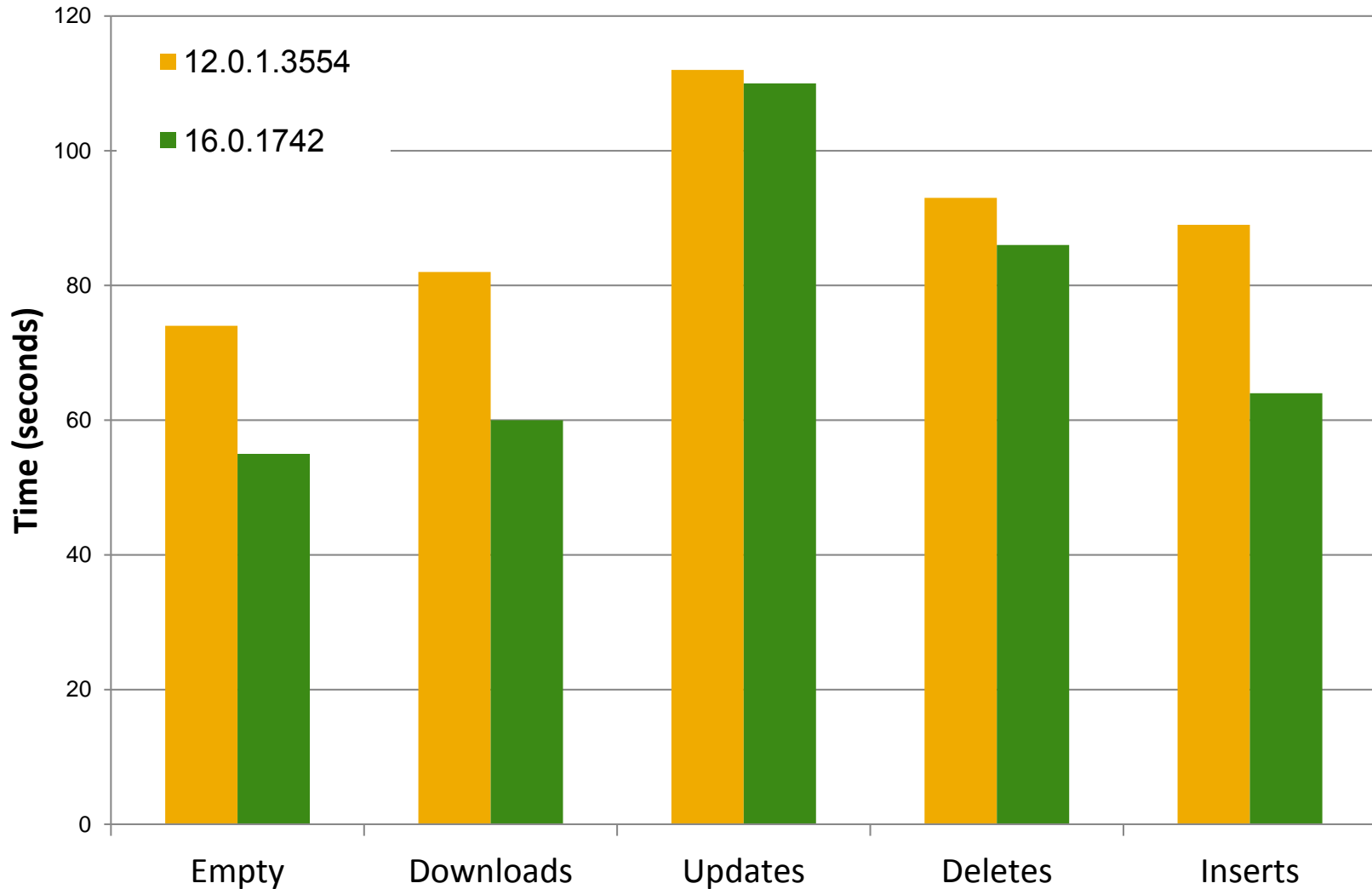
ML server can now process encryption and compression with concurrently

Enabled with `-wn` switch

One Network Thread



Five Network Threads



Performance: Schema Caching

11.0.0 Every sync sends schema

11.0.1 Only first sync sends schema

Server remembers it for subsequence syncs

Every sync object in the server keeps schema copy

16.0.0 Column and table names are interned

Better concurrency

Reduced server CPU use with many schemas

Schema Caching – Who Benefits?

Everyone will see server memory use fall by 512 bytes per column, per sync

- e.g. 200 tables with 20 columns and 100 concurrent syncs
Memory use will fall by $200 * 20 * 100 * 0.5\text{KB} \approx 200\text{MB}$

Deployments with lots of concurrent syncs might see higher throughput

Deployments with many publications or versions might see higher throughput

MobiLink: Consolidated Databases

DBMS	12.0.1	16	Comment
SAP HANA		1.00.32**	Windows x64 and Linux x64 only.
SAP Sybase SQL Anywhere	11.0.x 12.0.x	12.0.x 16	All MobiLink platforms. Will support pre-12 ML clients.
SAP Sybase ASE	15.0 15.5	15.5 15.7	Windows x64 and Linux x64 only
SAP Sybase IQ	15.2	15.4 16.0*	Windows x64 and Linux x64 only
Oracle	10g 11g	11g	All MobiLink platforms except Mac OS X.
SQL Server	2005 2008	2008 2012	Windows x64 only.
IBM DB2 LUW	9.5 9.7	9.7	Windows x64 and Linux x64 only
MySQL	5.1.3	5.1.3** 5.5	Windows x64 and Linux x64 only.

Improved HTTP

POST requests can now send non-empty responses

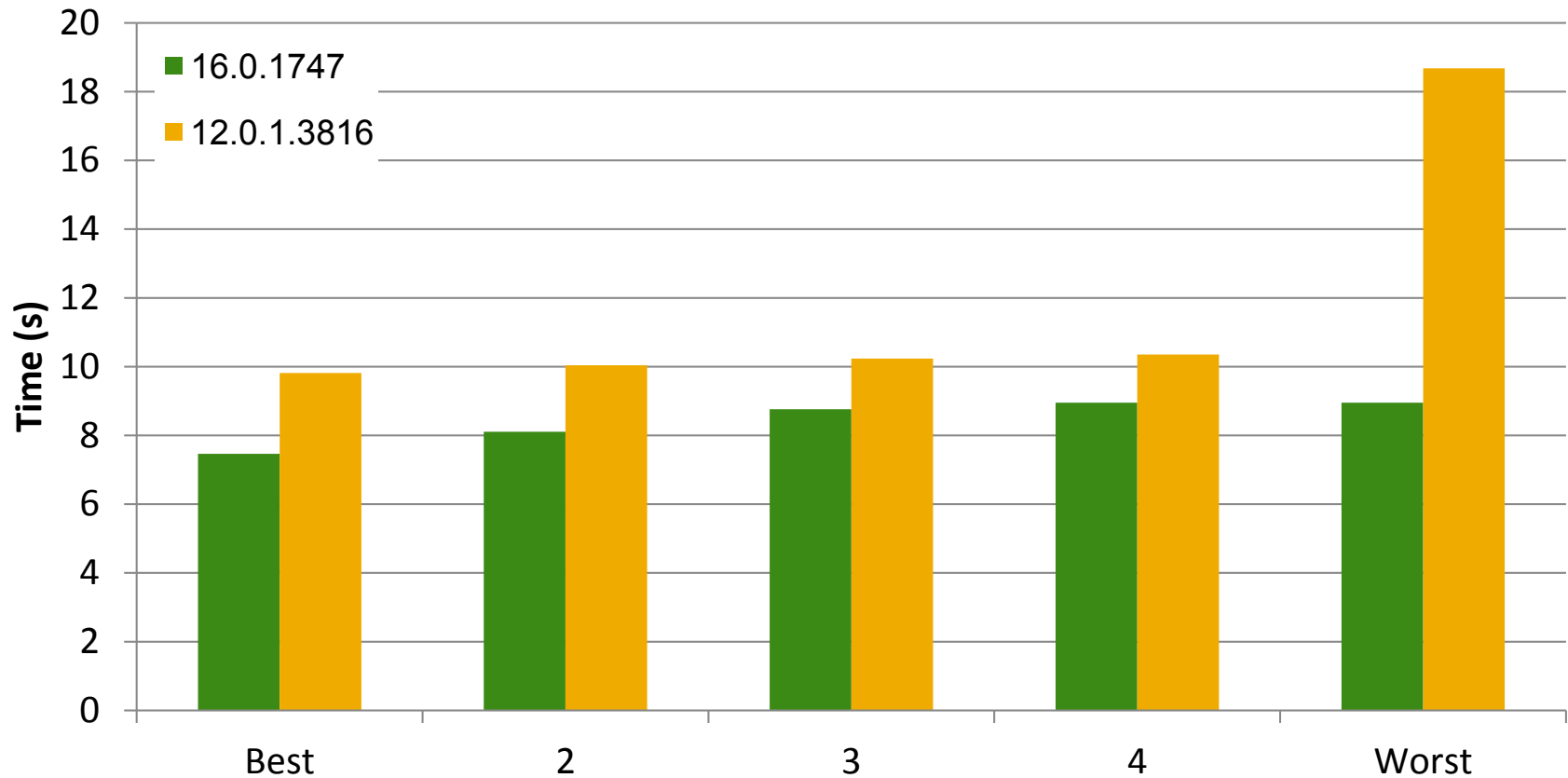
At least one fewer HTTP request per sync

With HTTP, reduces sync time by 1-2s on high latency (e.g. cellular) networks

With HTTPS, reduces sync time by 3-4s on high latency networks

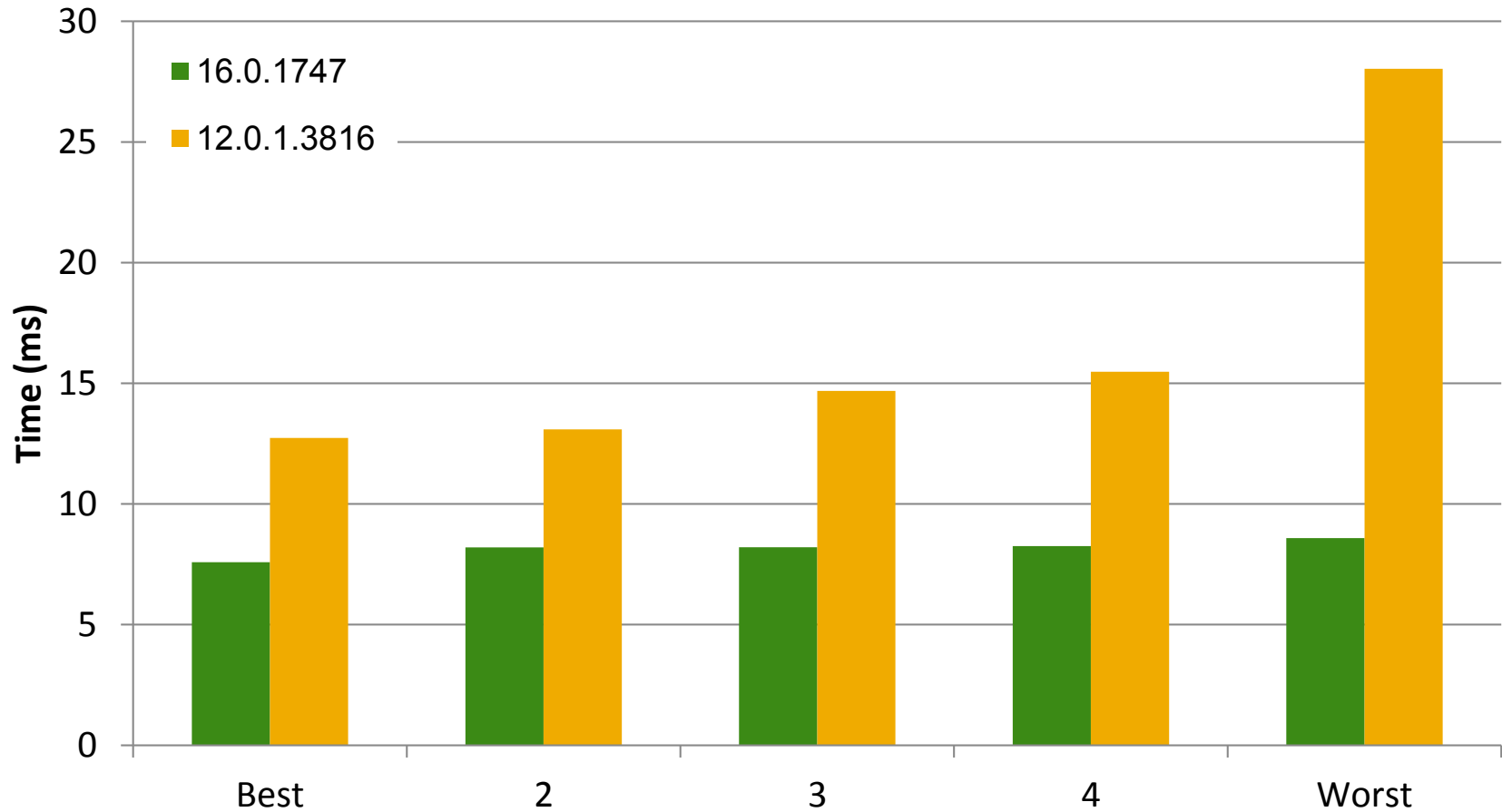
UltraLite for BlackBerry Sync Times – 12 vs 16

Download Only Synchronization



UltraLite for BlackBerry Sync Times – 12 vs 16

Full Synchronization



MobiLink Profiler replaces MobiLink Monitor

MobiLink Monitor (in version 8 through 12)

Helpful, except that:

- No high-level (eg. network/ML/database) information
- No low-level (eg. event or script) information, so had to use verbose ML log
- No detection of blocking in consolidated database
- No information for syncs in progress when Monitor connects
- Name confusion with SA Monitor for MobiLink

MobiLink Profiler

Addresses all the above, plus:

- Results stored in automatically created profiling database
- Much more detailed information is collected by sampling as well as event timing

MobiLink Profiler Demo

SQL Anywhere Monitor

What is it?

- **24x7 Health and availability tool for SA servers**
- **Collectors for SA database, ML server and RS**

What is it for?

- **Answers the question, “Is my system OK?”**
- **If not, it suggests ways to fix it**

What is it not?

- **Performance tuning tool: use the ML Profiler instead**
- **Administrative tool: use the ML Plugin for Sybase Central instead**

How it works

Self contained SA database

Contains a start event that executes an external Java procedure

Serves the UI over HTTP to a browser

- **Flex based, so it requires Flash**

**Alerts (4)**[Today \(4\)](#)[This Week \(4\)](#)[All \(4\)](#)**Dashboards**[Overview](#)[MLServer](#)[\(Add New...\)](#)**Tools**[Search](#)[User Settings](#)[Administration](#)[About](#)**MLServer**[Customize](#)**Alert List**

Severity	Alert	Time	Status	Resource
	Ser	2013/03/11 17:04	Inactive	M...
	Top	2013/03/11 11:38	Active	M...
	Ser	2013/03/11 11:02	Inactive	M...
	Ser	2013/03/11 11:02	Inactive	M...

Alerts 1 to 4 of 4

[Mark Resolved](#)[Mark Unresolved](#)[Delete...](#)[Select All](#)[Details](#)**Server Info**

Metric	Value
Server Name	mlreplay_svr
Version	16.0.0.1324
Start Time	2013/03/11 16:19
Host	YKFN00528042A
Is Consolidated Available?	Yes
Is Primary Server?	No
Is Primary Server Known?	Yes
Unsubmitted Error Reports	5
Last Checked Time	2013/03/11 17:04
Unavailable Since	0

Key Performance Metrics

Metric	Value	1 Hour T	Range
CPU Usage	0.08 %		
Synchronizations	0 syncs		
Started Synchronization Rate	0 syncs/second		
Completed Synchronization Rate	0 syncs/second		
Failed Synchronization Rate	0 syncs/second		
Max Synchronization Time	0 seconds		
Percent of Connections in Use	0 %		

Sync Metrics

Metric	Value	1 Hour Trend
Started Synchronization Rate	0 syncs/second	
Completed Synchronization Rate	0 syncs/second	
Failed Synchronization Rate	0 syncs/second	
Finished Synchronization Rate	0 syncs/second	

Alerts

If the server is in a bad state an alert is raised

Can send an email to people interested in the health of the server

Alerts say what the problem is, and suggest ways to fix it

Many different alerts

High CPU use

Long sync

Host/Server down

Long wait for DB

Low disk space

Too many failed syncs

Memory problems

Too many errors

Swapping to disk

Consolidated down

Metrics

100+ metrics for ML server

Throughput measures

Number of syncs in each profiler phase

Memory/CPU use

All metrics are high level, server wide counts

No request specific data

MobiLink: Modeling and Design (Sybase Central)

More focus on being a full lifecycle tool

Integrated testing tool

Simplified work flow – users are asked to make fewer decisions

Better generated SQL (especially conflict detection)

MobiLink Modeler Demo

Security

Security

Client certs / Mutual x.509 authentication

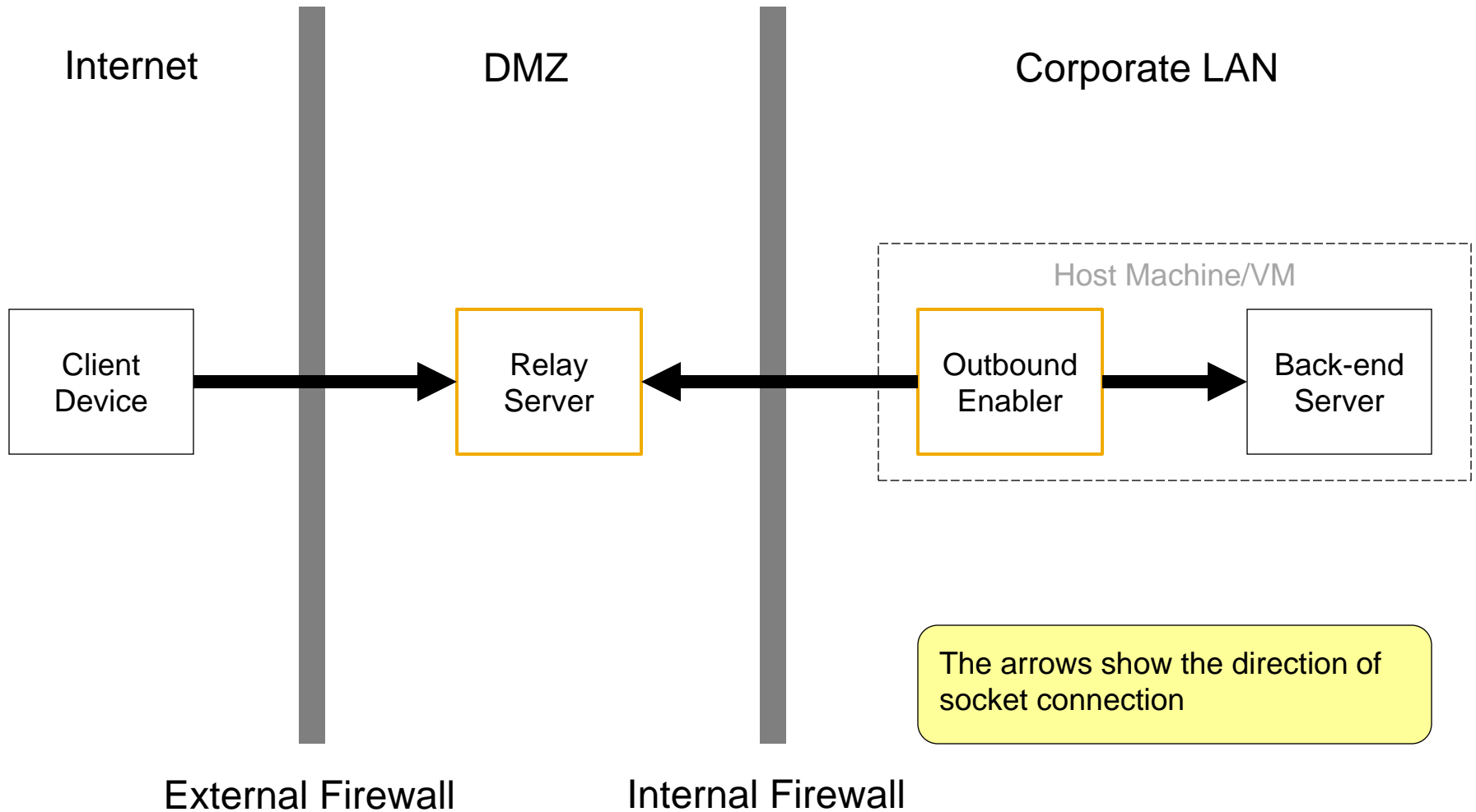
Easier LDAP Authentication

Download and encrypt a database file

Standard key derivation (PKCS#5)

Relay Server

Relay Server Deployment - Simplified



Relay Server

IIS 8.0 and Apache 2.4 support

Quick Setup

Flow control

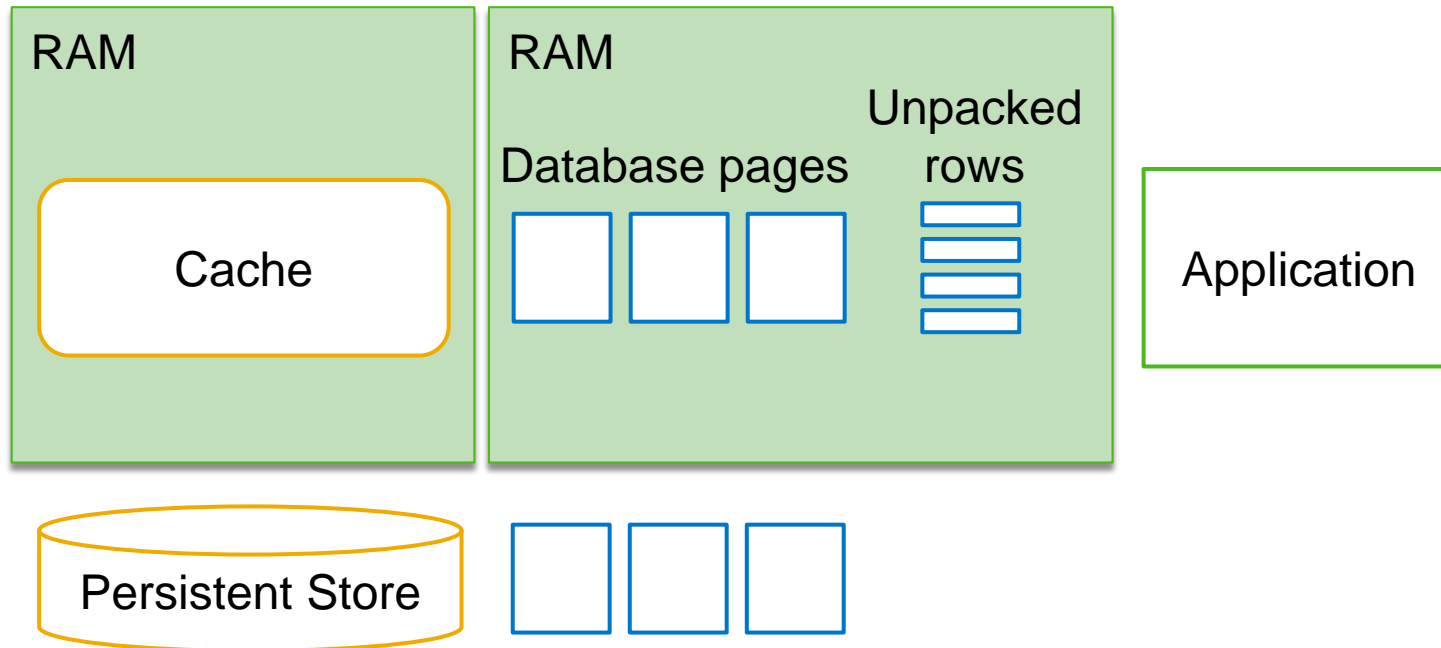
Renew Overlapped Cookie

Improved Proxy Support

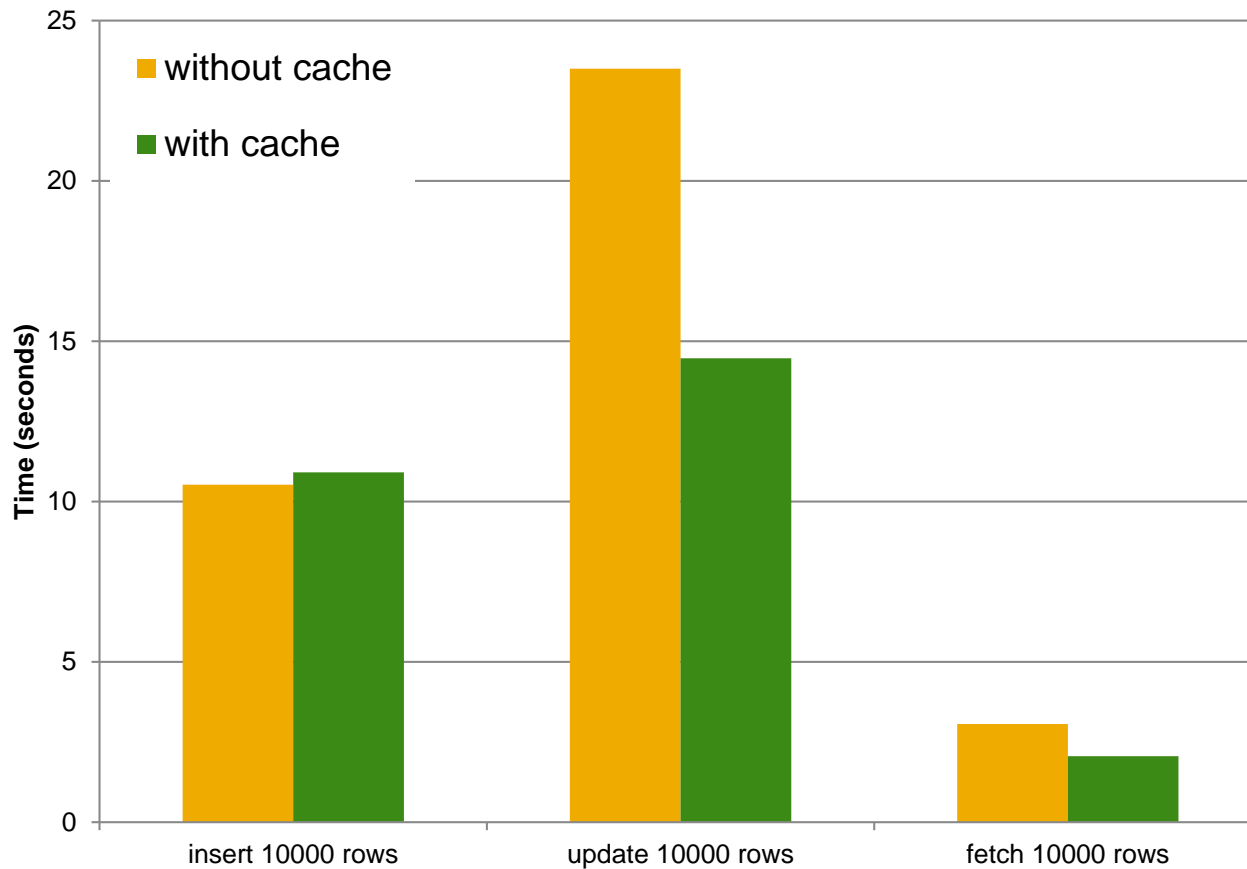
UltraLite



UltraLite in-memory improvements: row caching

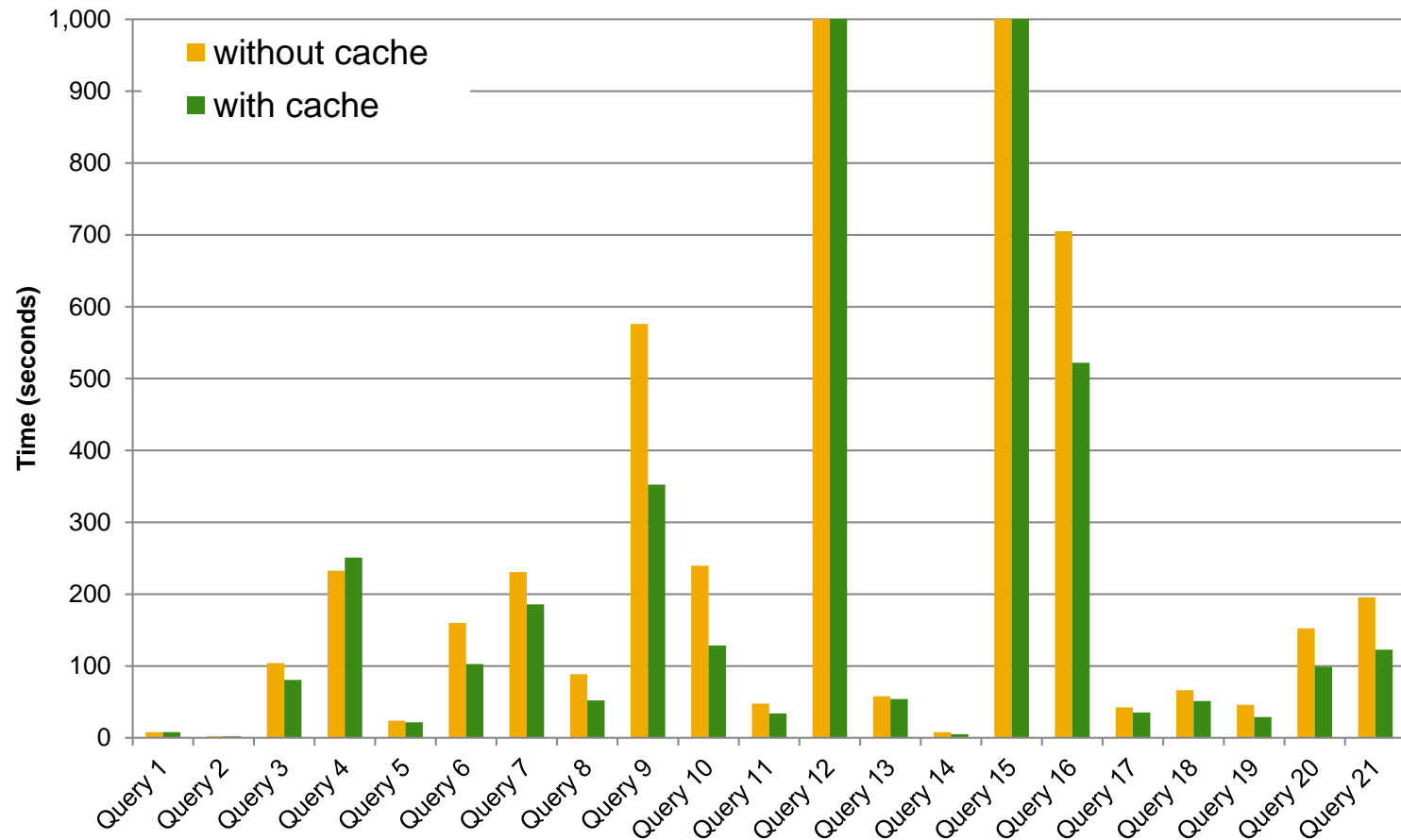


UltraLite in-memory computing: row caching



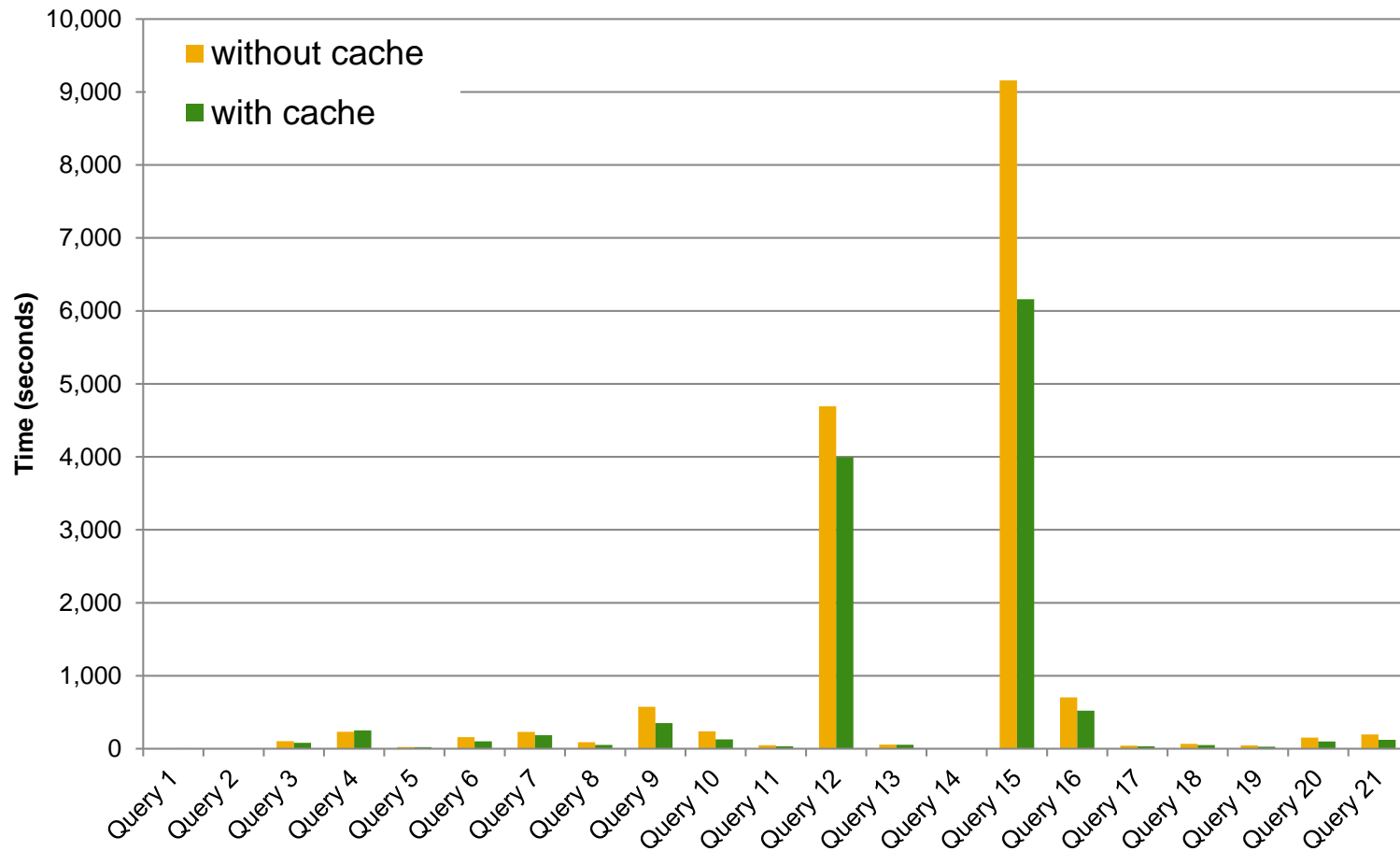
UltraLite in-memory computing: row caching

Average query speedup: 24%



UltraLite in-memory computing: row caching

Average query speedup: 24%



UltraLite: Platform-Specific Improvements

Android enhancements

bring API up to C++ level

iOS updates

BlackBerry enhancements

ZLIB compression

E2EE

HTTP Authentication

Custom HTTP headers

Index hashing

Error reporting

AES 256-bit encryption

Summary

Continued enhancement of MobiLink, Relay Server, and UltraLite, with focus on core feature improvement

- **Security improvements**
- **Performance improvements**
- **Usability improvements**



Thank you

<http://dcx.sybase.com/index.html#sa160/en/sachanges/sachanges16.html>

<http://scn.sap.com/community/sybase-sql-anywhere>

<http://sqlanywhere-forum.sybase.com>

<http://www.sap.com/campaign/na/usa/CRM-XU13-CST-SQLDEVEDM/index.html>

SQL Anywhere Server webcast:

<http://www.sap.com/community/int/showdoc.epx?98894440C64747EE6D07DE85038E5771B08E568F8251ED6F>

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